DEPARTMENT OF THE NAVY
FISCAL YEAR (FY) 2000/2001 BIENNIAL BUDGET ESTIMATES



19990505 027

JUSTIFICATION OF ESTIMATES
FEBRUARY 1999

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

DTIC QUALITY INSPECTED 4

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Department of the Navy
FY 2000 RDT&E Program

Exhibit R-1

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

DATE: February 1999

R-1 Line Number	Program Element Number	Item Nomenclature	Budget Activity	Thousands of Dollars FY 1998	FY 1999	FY 2000	Security Classification
81	0603208N	Training System Aircraft	5	278	594	311	U
82	0604212N	ASW & Other Helo Development	5	56,675	56,641	48,776	U
83	0604214N	AV8B Aircraft (Eng)	5	10,315	30,807	38,599	U
84	0604215N	Standards Development	5	35,044	50,811	74,325	U
85	0604216N	Multi-Mission Helicopter Upgrade Development	5	68,903	213,451	118,701	U
86	0604217N	S-3 Wpn System Improvement	5	2,081	4,266	2,095	U
87	0604218N	Air/Ocean Equipment Engineering	5	5,738	5,966	6,095	U
88	0604221N	P-3 Modernization Program	5	12,403	2,828	3,010	U
89	0604231N	Tactical Command System	5	37,058	49,867	41,599	U
90	0604245N	USMC H-1 Upgrades	5	81,290	120,254	157,683	U
91	0604261N	Acoustic Search Sensors	5	17,652	30,367	25,953	U
92	0604262N	V-22	5	487,649	345,782	182,885	U
93	0604264N	Air Crew Systems Development	5	16,985	11,322	6,801	U
94	0604270N	EW Development	5	93,797	134,873	163,077	U
95	0604300N	SC-21 Total Ship System Engineering	5	58,548	125,964	162,056	U
96	0604307N	AEGIS Combat System Engineering	5	110,136	182,476	204,480	U
97	0604310N	Arsenal Ship	5	13,020	-	-	U
98	0604311N	LPD-17 Development	5	13,743	1,340	2,608	U
99	0604312N	Tri-Service Standoff Attack Missile	5	5,251	2,055	2,020	U
100	0604355N	Vertical Launch ASROC	5	8,488	-	-	U
101	0604366N	Standard Missile Improvements	5	501	11,291	1,140	U
102	0604373N	Airborne MCM	5	17,297	30,877	20,642	U
103	0604503N	SSN-688 and Trident Modernization	5	55,988	61,863	48,896	U
104	0604504N	Air Control	5	8,632	7,477	8,696	U
105	0604507N	Enhanced Modular Signal Processor	5	1,493	1,535	970	U
106	0604512N	Shipboard Aviation Systems	5	8,774	8,430	9,052	U
107	0604518N	CIC Conversion	5	10,196	4,565	8,126	U
108	0604524N	Submarine Combat System	5	16,960	11,399	6,546	U
109	0604528N	SWATH Oceanographic Ship	5	45,000	-	-	U
110	0604558N	New Design SSN Development	5	299,470	230,336	241,456	U

Department of the Navy
FY 2000 RDT&E Program

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DATE: February 1999

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111	0604561N	SSN-21 Development	5	49,553	21,735	32,001	U
112	0604562N	Submarine Tactical Warfare System	5	39,515	27,816	13,353	U
113	0604567N	Ship Contract Design/Live Fire T&E	5	35,098	45,263	61,135	U
114	0604574N	Navy Tactical Computer Resources	5	31,582	28,059	3,300	U
115	0604601N	Mine Development	5	2,294	15	3,315	U
116	0604603N	Unguided Conventional Air-launched Weapons	5	28,158	5,122	1,598	U
117	0604610N	Lightweight Torpedo Development	5	15,773	7,929	9,297	U
118	0604612M	MC Mine Countermeasures (Eng)	5	616	3,791	1,002	U
119	0604618N	Joint Direct Attack Munition	5	15,389	11,160	11,782	U
120	0604654N	Jt Serv Explosive Ordnance Dev	5	6,399	7,021	7,133	U
121	0604703N	Personnel, Trng, Simulation & Human Factors	5	980	1,232	1,252	U
122	0604710N	Navy Energy Program	5	2,830	3,530	5,446	U
123	0604721N	Battle Group Passive Horizon Extension System	5	4,141	4,012	1,791	U
124	0604727N	Joint Standoff Weapon Systems	5	74,151	47,346	30,567	U
125	0604755N	Ship Self Defense	5	151,868	130,841	96,580	U
126	0604771N	Medical Development (Engineering)	5	15,656	5,807	4,285	U
127	0604777N	Navigation/ID System	5	39,826	45,992	19,808	U
128	0604784N	Distributed Surveillance System	5	40,095	49,167	14,910	U
129	0604800N	Joint Strike Fighter (R2/R3 Not Provided/FY 2001Submission)	5	-	-	-	U
130	0604805N	Commercial Operating Support Savings	5	-	16,462	18,729	U
		Total Engineering and Manufacturing Development		2,153,289	2,199,737	1,923,882	

Department of the Navy
FY 2000 RDT&E Program
Alphabetic Listing

Exhibit R-1

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93	0604264N	Air Crew Systems Development	5	16,985	11,322	6,801	U
87	0604218N	Air/Ocean Equipment Engineering	5	5,738	5,966	6,095	U
102	0604373N	Airborne MCM	5	17,297	30,877	20,642	U
97	0604310N	Arsenal Ship	5	13,020	-	-	U
82	0604212N	ASW & Other Helo Development	5	56,675	56,641	48,776	U
83	0604214N	AV8B Aircraft (Eng)	5	10,315	30,807	38,599	U
123	0604721N	Battle Group Passive Horizon Extension System	5	4,141	4,012	1,791	U
107	0604518N	CIC Conversion	5	10,196	4,565	8,126	U
130	0604805N	Commercial Operating Support Savings	5	-	16,462	18,729	U
105	0604507N	Enhanced Modular Signal Processor	5	1,493	1,535	970	U
94	0604270N	EW Development	5	93,797	134,873	163,077	U
119	0604618N	Joint Direct Attack Munition	5	15,389	11,160	11,782	U
124	0604727N	Joint Standoff Weapon Systems	5	74,151	47,346	30,567	U
129	0604800N	Joint Strike Fighter (R2/R3 Not Provided/FY 2001Submission)	5	-	-	-	U
120	0604654N	Jt Serv Explosive Ordnance Dev	5	6,399	7,021	7,133	U
117	0604610N	Lightweight Torpedo Development	5	15,773	7,929	9,297	U
98	0604311N	LPD-17 Development	5	13,743	1,340	2,608	U
118	0604612M	MC Mine Countermeasures (Eng)	5	616	3,791	1,002	U
126	0604771N	Medical Development (Engineering)	5	15,656	5,807	4,285	U
115	0604601N	Mine Development	5	2,294	15	3,315	U
85	0604216N	Multi-Mission Helicopter Upgrade Development	5	68,903	213,451	118,701	U
127	0604777N	Navigation/ID System	5	39,826	45,992	19,808	U
122	0604710N	Navy Energy Program	5	2,830	3,530	5,446	U
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86	0604217N	S-3 Wpn System Improvement	5	2,081	4,266	2,095	U
95	0604300N	SC-21 Total Ship System Engineering	5	58,548	125,964	162,056	U
113	0604567N	Ship Contract Design/Live Fire T&E	5	35,098	45,263	61,135	U
125	0604755N	Ship Self Defense	5	151,868	130,841	96,580	U
106	0604512N	Shipboard Aviation Systems	5	8,774	8,430	9,052	U
111	0604561N	SSN-21 Development	5	49,553	21,735	32,001	U
103	0604503N	SSN-688 and Trident Modernization	5	55,988	61,863	48,896	U
101	0604366N	Standard Missile Improvements	5	501	11,291	1,140	U
84	0604215N	Standards Development	5	35,044	50,811	74,325	U
108	0604524N	Submarine Combat System	5	16,960	11,399	6,546	U
112	0604562N	Submarine Tactical Warfare System	5	39,515	27,816	13,353	U
109	0604528N	SWATH Oceanographic Ship	5	45,000	-	-	U
89	0604231N	Tactical Command System	5	37,058	49,867	41,599	U
81	0603208N	Training System Aircraft	5	278	594	311	U
99	0604312N	Tri-Service Standoff Attack Missile	5	5,251	2,055	2,020	U
116	0604603N	Unguided Conventional Air-launched Weapons	5	28,158	5,122	1,598	U
90	0604245N	USMC H-1 Upgrades	5	81,290	120,254	157,683	U
92	0604262N	V-22	5	487,649	345,782	182,885	U
100	0604355N	Vertical Launch ASROC	5	8,488	-	-	U
		Total Engineering and Manufacturing Development		2,153,289	2,199,737	1,923,882	

Comparison of FY 1998 Financing as reflected in FY 1999 Budget with 1998 Financing as Shown in the FY 2000 Budget

($ In Thousands)

	Financing per FY 1999 Budget	Financing Per FY 2000 Budget	Increase (+) or Decrease (-)
Program Requirements (Service Account)	7,879,912	7,887,810	+7,898
Program Requirements (Reimbursable)	110,000	163,008	+53,008
Appropriation (Adjusted)	**7,989,912**	**8,050,818**	**+60,906**

Explanation of Changes in Financing
($ in Thousands)

The Fiscal Year 1998 program has changed since the presentation of the FY 1999 budget as noted below:

1. Program Requirements (Total). There has been a net increase to the appropriation (adjusted) of +$60,906 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 +$7,898, resulting from various changes in program requirements. These changes included recissions reflected in the FY 99 DoD Appropriations Act (-$20,500), Line Item Veto Restorals (+$6,000), and other Congressional Actions (-$8,000). A number of Internal Reprogrammings were effected which reclassified funding between DoN appropriations to more properly align them into the correct programs for execution: Medical Research Projects (-$7,278), Tactical Tomahawk (+$19,600), PMRF Sensors (-$4,852), F/A-18 (-$14,855), and ASW Combat System Integration (+$5,861). Additionally, other transfers included Overseas Contingency Operations (+$7,500) and Counterdrug Operations (+$15,613).

3. Program Requirements (Reimbursable). There has been a net increase to the appropriation of $53,008, as a result of changes in reimbursable program requirements.

Comparison of FY 1998 Program Requirements as reflected in the FY 1999 Budget with FY 1998 Program Requirements as shown in the FY 2000 Budget

Summary of Requirements ($ in Thousands)

	Total Program Requirements per FY 1999 Budget	Total Program Requirements per FY 2000 Budget	Increase (+) or Decrease (-)
01 – Basic Research	338,743	331,444	-7,299
02 – Applied Research	493,622	467,359	-26,263
03 – Advanced Technology Development	514,781	518,617	+3,836
04 – Demonstration and Validation (DEM/VAL)	2,219,002	2,222,171	+3,169
05 – Engineering and Manufacturing Development (EMD)	2,227,348	2,153,289	-74,059
06 – RDTE Management Support	551,033	677,567	+126,534
07 – Operational Systems Development	1,535,383	1,517,363	-18,020
Total Fiscal Year Program	**7,879,912**	**7,887,810**	**+7,898**

Explanation by Budget Activity
($ in Thousands)

01. Basic Research (-$7,299) - Changes to this budget activity resulted from a transfer to support the Small Business Innovative Research (SBIR) program (-$6,086) and other changes in program requirements which required minor reprogrammings (-$1,213).

02. Applied Research (-$26,263) - Changes to this budget activity resulted from a transfer to support the Small Business Innovative Research (SBIR) program (-$8,125), other changes in program requirements which required minor reprogrammings (-$21,118) and the override by Congress of a line item veto for Terfenol-D (+$3,000).

03. Advanced Technology Development (+$3,836) - Changes to this budget activity resulted from a transfer to support the Small Business Innovative Research (SBIR) program (-$3,897), other changes in program requirements which required minor reprogrammings (-$12,011), the override of a line item veto for COTS Airguns (+$3,000), and the transfer of Medical Research program funds to the Army (-$7,278).

04. Demonstration and Validation (DEM/VAL) (+$3,169) - Changes to this budget activity resulted from a transfer to support the Small Business Innovative Research (SBIR) program (-$29,846), reductions reflected on the FY 1999 DoD Appropriations Act Rescission for VECTOR (-$3,000), and other changes in program requirements which required minor reprogrammings, budget activity realignments and accounting updates (+$36,015).

05. Engineering and Manufacturing Development (EMD) (-$74,059) - Changes to this budget activity resulted from a transfer to support the Small Business Innovative Research (SBIR) program (-$56,113), transfers to support the Counterdrug Program (+$15,613), other changes in program requirements which required minor reprogrammings, budget activity realignments and accounting updates (-$26,019), a transfer to Defense Health Program and the Boy Scouts per a Congressional Supplemental (-$5,000) and Federal Technology (-$40), and a FY 1999 DoD Appropriation Act rescissions for Lightweight Torpedo (-$1,500) and Navigation/ID Systems (-$1,000).

06. RDTE Management Support (+$126,534) - Changes to this budget activity resulted from a transfer to support the Small Business Innovative Research (SBIR) program (+$120,551), other changes in program requirements which required minor reprogrammings, budget activity realignments and accounting updates (+$5,747) and a transfer for Federal Technology (+$236).

07. Operational Systems Development (-$18,020) - Changes to this budget activity resulted from a transfer to support the Small Business Innovative Research (SBIR) program (-$16,484), other changes in program requirements which required minor reprogrammings, budget activity realignments and accounting updates (-$14,697), and transfers and major reprogrammings for Overseas Contingency Operations (+$7,500), PMRF Sensors (-$4,852), Tactical Tomahawk (+$19,600), Surface ASW Combat Integration (+$5,861), F/A-18 (-$14,855), and Federal Technology Transfer (-$93).

Comparison of FY 1999 Financing as reflected in FY 1999 Budget with 1999 Financing as Shown in the FY 2000 Budget

($ In Thousands)

	Financing per FY 1999 Budget	Financing Per FY 2000 Budget	Increase (+) or Decrease (-)
Program Requirements (Service Account)	8,108,923	8,660,809	+551,886
Program Requirements (Reimbursable)	110,000	150,000	+40,000
Appropriation (Adjusted)	**8,218,923**	**8,810,809**	**+591,886**

Explanation of Changes in Financing
($ in Thousands)

The Fiscal Year 1999 program has changed since the presentation of the FY 2000 budget as noted below:

1. Program Requirements (Total). There has been a net increase to the appropriation (adjusted) of +$591,886, 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 +$551,886, resulting from changes in program requirements as a result of Congressional appropriation changes in the FY 1999 DoD Appropriations Act. These changes included: an undistributed reduction for Federally Financed Research and Development Centers (FFRDC)(-$4,264)(Section 8034), an undistributed reduction for Contract Advisory and Assistance Services (CAAS)(-$50,000)(Section 8054), a general reduction for revised economic assumptions (lower inflation rate)(-$20,000)(Section 8108), and a general undistributed reduction for civilian personnel underexecution (-$5,000). Specific FY 1999 Congressional adjustments (to start, continue, discontinue, reduce or earmark 177 specific initiatives, including transfers) resulted in a net increase of +$584,726. Also, appropriation changes include the following reprogrammings, which require Congressional prior approval: ASW & Other Helo Development (CH-60) (+$9,352); Surface and Shallow Water Mines (+$8,980); Combat Systems Integration (+$12,526); Ship Self Defense (+12,672); partially financed by a reduction to Depot Maintenance (-$11,006). Additionally, FY 1999 includes a transfer for the USACOM Joint Experiments program (+$15,900), managed by the Navy as DoD executive agent.

3. Program Requirements (Reimbursable). There has been a net increase to the appropriation of +$40,000, as a result of changes in reimbursable program requirements (+$40,000).

Comparison of FY 1999 Program Requirements as reflected in the FY 1999 Budget with FY 1999 Program Requirements as shown in the FY 2000 Budget

Summary of Requirements ($ in Thousands)

	Total Program Requirements per FY 1999 Budget	Total Program Requirements per FY 2000 Budget	Increase (+) or Decrease (-)
01 – Basic Research	362,679	361,499	-1,180
02 – Applied Research	524,723	566,801	+42,078
03 – Advanced Technology Development	460,725	593,176	+132,451
04 – Demonstration and Validation (DEM/VAL)	2,358,359	2,408,520	+50,161
05 – Engineering and Manufacturing Development (EMD)	2,063,281	2,199,737	+136,456
06 – RDTE Management Support	616,973	598,664	-18,309
07 – Operational Systems Development	1,722,183	1,932,412	+210,229
Total Fiscal Year Program	**8,108,923**	**8,660,809**	**+551,886**

Explanation by Budget Activity
($ in Thousands)

01. Basic Research (-$1,180) - Changes to this budget activity resulted from the following Congressional undistributed reductions reflected in the FY 1999 DoD Appropriations Act. These changes included: an undistributed reduction for Federally Financed Research and Development Centers (FFRDC)(-$7)(Section 8034), an undistributed reduction for civilian personnel underexecution (-$338), and a general reduction for revised economic assumptions (lower inflation rate)(-$835)(Section 8108).

02. Applied Research (+$42,078) - Changes to this budget activity resulted from the following Congressional undistributed reductions reflected in the FY 1999 DoD Appropriations Act. These changes included: an undistributed reduction for Federally Financed Research and Development Centers (FFRDC)(-$130)(Section 8034), an undistributed

reduction for Contract Advisory and Assistance Services (CAAS)(-$1,755)(Section 8054), an undistributed reduction for civilian personnel underexecution (-$724), and a general reduction for revised economic assumptions (lower inflation rate)(-$1,313)(Section 8108). Specific FY 1999 Congressional adjustments (to start, continue, discontinue, reduce or earmark 31 specific initiatives, including transfers) resulted in a net increase of +$46,000.

03. Advanced Technology Development (+$132,451) - Changes to this budget activity resulted from the following Congressional undistributed reductions reflected in the FY 1999 DoD Appropriations Act. These changes included: an undistributed reduction for Federally Financed Research and Development Centers (FFRDC)(-$146)(Section 8034), an undistributed reduction for Contract Advisory and Assistance Services (CAAS)(-$1,571)(Section 8054), an undistributed reduction for civilian personnel underexecution (-$516), and a general reduction for revised economic assumptions (lower inflation rate)(-$1,316)(Section 8108). Specific FY 1999 Congressional adjustments (to start, continue, discontinue, reduce or earmark 33 specific initiatives, including transfers) resulted in a net increase of +$113,100. Additionally, FY 1999 includes a transfer for the USACOM Joint Experiments program (+$15,900), managed by the Navy as DoD executive agent. Last, the FY 1999 program is increased by +$7,000 to fully fund the VECTOR program.

04. Demonstration and Validation (DEM/VAL) (+$50,161) - Changes to this budget activity resulted from the following Congressional undistributed reductions reflected in the FY 1999 DoD Appropriations Act. These changes included: an undistributed reduction for Federally Financed Research and Development Centers (FFRDC)(-$1,228)(Section 8034), an undistributed reduction for Contract Advisory and Assistance Services (CAAS)(-$5,650)(Section 8054), an undistributed reduction for civilian personnel underexecution (-$1,234), and a general reduction for revised economic assumptions (lower inflation rate)(-$5,550)(Section 8108). Specific FY 1999 Congressional adjustments (to start, continue, discontinue, reduce or earmark 46 specific initiatives, including transfers) resulted in a net increase of +$55,101. Also, appropriation changes include the following reprogrammings, which require Congressional prior approval: Surface and Shallow Water Mines (+$8,980); Combat Systems Integration (+$12,526); and CEC (+15,000); partially financed by a reduction to Gun Weapons Systems Technology (-$11,301) and Hardened Target Munitions (-$9,827). Additionally, changes in program requirements required minor reprogrammings (-$6,656).

05. Engineering and Manufacturing Development (EMD) (+$136,456) - Changes to this budget activity resulted from the following Congressional undistributed reductions reflected in the FY 1999 DoD Appropriations Act. These changes included: an undistributed reduction for Federally Financed Research and Development Centers (FFRDC)(-$151) (Section 8034), an undistributed reduction for Contract Advisory and Assistance Services (CAAS)(-$23,648)(Section 8054), an undistributed reduction for civilian personnel underexecution (-$878) and a general reduction for revised economic assumptions (lower inflation rate) (-$5,065)(Section 8108). Specific FY 1999 Congressional adjustments (to

start, continue, discontinue, reduce or earmark 41 specific initiatives, including transfers) resulted in a net increase of +$136,979. Also, appropriation changes include the following reprogrammings, which require Congressional prior approval: AEGIS Combat System Improvements (-$5,050); AEGIS Combat Systems Engineering (+$24,300); AV-8B Aircraft (Engineering) (-$9,615); ASW and Other Helo Developments (+$9,352); and Ship Self-Defense (+$12,672). Additionally, changes in program requirements required minor reprogrammings (-$1,440).

06. RDTE Management Support (-$18,309) - Changes to this budget activity resulted from the following Congressional undistributed reductions reflected in the FY 1999 DoD Appropriations Act. These changes included: an undistributed reduction for Federally Financed Research and Development Centers (FFRDC)(-$2,292)(Section 8034), an undistributed reduction for Contract Advisory and Assistance Services (CAAS)(-$3,338)(Section 8054), an undistributed reduction for civilian personnel underexecution (-$485) and a general reduction for revised economic assumptions (lower inflation rate)(-$1,394)(Section 8108). Specific FY 1999 Congressional adjustments (to start, continue, discontinue, reduce or earmark 10 specific initiatives, including transfers) resulted in a net decrease of -$10,800.

07. Operational Systems Development (+$210,229) - Changes to this budget activity resulted from the following Congressional undistributed reductions reflected in the FY 1999 DoD Appropriations Act. These changes included: an undistributed reduction for Federally Financed Research and Development Centers (FFRDC)(-$310)(Section 8034), an undistributed reduction for Contract Advisory and Assistance Services (CAAS)(-$14,038)(Section 8054), an undistributed reduction for civilian personnel underexecution (-$825) and a general reduction for revised economic assumptions (lower inflation rate)(-$4,527)(Section 8108). Specific FY 1999 Congressional adjustments (to start, continue, discontinue, reduce or earmark 27 specific initiatives, including transfers) resulted in a net increase of +$243,346. Also, appropriation changes include the following reprogrammings, which require Congressional prior approval: Depot Maintenance -$10,922. Additionally, changes in program requirements required minor reprogrammings (-$2,495).

EXHIBIT R-2, FY 2000 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1999

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

(U) COST: (Dollars in Thousands)

Project Number & Title	FY 1998 Budget	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete	Total Program
H1150 Joint Primary Aircraft Trainer System	278	594	311							1,183
TOTAL	278	594	311	0	0	0	0	0	0	1,183

Quantity of RDT&E Articles: N/A

(U) A. 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 unique courseware development and conversion.

(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.

EXHIBIT R-2, FY 2000 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1999

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

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. FY 1998 ACCOMPLISHMENTS:

(U) ($278) Began development of Navy unique courseware and graphical user interface (GUI).

2. FY 1999 PLAN:

(U) ($579) Continue Navy unique courseware development and begin courseware conversion.
(U) ($15) **Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15 USC 638.**

3. FY 2000 PLAN:

(U) ($311) Complete Navy unique courseware development.

(U) B. PROGRAM CHANGE SUMMARY

	FY 1998	FY 1999	FY 2000
(U) FY 1999 President's Budget:	391	595	316
(U) Appropriated Value:	403	595	
(U) Adjustments from Pres Budget:	-113	-1	-5
(U) FY 2000 President's Budget Submit	278	594	311

EXHIBIT R-2, FY 2000 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1999

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

CHANGE SUMMARY EXPLANATION:

(U) Funding: The net decrease in FY 1998 of -$113K reflects a -$200K BSO realignment, a +$72K BTR plus-up, a -$12K SBIR reduction, and a +$27K OSD adjustment.

In FY 99, the net decrease of -$1K reflects a balancing adjustment.

In FY 00 the net decrease of -$5K reflects a -$1K balancing adjustment and -$4K inflation adjustment.

(U) Schedule: N/A

(U) Technical: N/A

(U) C. OTHER PROGRAM FUNDING SUMMARY

Appn	FY 1998 Budget	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete
APN-3	0	0	44,826	82,299	107,090	104,470	111,495	101,737	1,177,550
APN-6	0	0	0	0	0	11,398	2,995	3,422	43,060

Related RDT&E: Not applicable.

( ) P.E.

(U) D. ACQUISITION STRATEGY:
JPATS is a joint Air Force/Navy Acquisition 1C program, with the Air Force as executive service. JPATS is also a pilot program for acquisition reform. The contract was competitively awarded as a fixed price incentive firm (FPIF) contract for manufacturing development, plus seven priced production lot options.

EXHIBIT R-2, FY 2000 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0603208N**
PROGRAM ELEMENT TITLE: Trainer System Aircraft

(U) E. SCHEDULE PROFILE

	FY 1998	FY 1999	FY 2000	TO COMPLETE
(U) Program Milestones			2Q MS III	4Q/03 USN IOC
(U) Engineering Milestones		4Q GBTS CDR		
(U) T&E Milestones	3Q A/C OA	3Q A/C MOT&E		
(U) Contract Milestones	2Q LOT 5 AWD*	2Q LOT 6 AWD*	2Q LOT 7 AWD	2Q/01 LOT 8 AWD

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

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604212N
PROGRAM ELEMENT TITLE: ASW & Other Helo Developments

(U) COST: (Dollars in Thousands)

Project Number & Title	FY 1998 Budget	FY 1999 Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete	Total Program
H1109 CH/MH-53	1,163	2,775	4,009	472	2,382	3,024	3,108	3,182	cont	cont
H1709, CH-60 VERTREP*	0	25,940	19,634	0	0	0	0	0	0	52,484
RDT&E Test Articles										1
H2415 CH-60S Development**	29,694	11,972	15,279	13,287	15,744	6,437	5,953	5,448	cont	cont
H2463, LAMPS III DATALINK***	0	2,993	9,854	10,852	25,621	0	0	0	0	49,320
RDT&E Test Articles			1	4	2					7
TOTAL	**30,857**	**43,680**	**48,776**	**24,611**	**43,747**	**9,461**	**9,061**	**8,630**	**cont**	**cont**
Quantity of RDT&E Articles			**1**	**4**	**2**					**8**

* H1709: FY99 control reflects a $13,352 thousand Above Threshold Reprogramming action. FY00 control includes $11,927 thousand for Airborne Mine Counter Measure (AMCM) efforts.

** H2415: FY98 includes $29,694 thousand for CH-60S VERTREP developmental efforts. FY 98 reflects CH-60S VERTREP only. FY 99 reflects both CH-60S VERTREP and AMCM efforts. FY 00 reflects Airborne Mine Counter Measures (AMCM) efforts.

*** H2463: FY 99 estimate includes a congressional transfer of $2,993 thousand from the CEC program for the LAMPS MK III Data Link execute d under project H2632.

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

(U) H1109- From FY-96 through FY-98, 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, in FY-98, the program completes 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 RDT&E, Service Life Assessment Program (SLAP) commences a two year effort on the CH-53D. The Marine Corps Aviation Plan shows the CH-53D remaining in service until 2008. 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 will be a report to identify specific actions required to make CH-53D a supportable, viable weapons system until it is retired from service. The report shall include, at a minimum, identification of airframe structural modification changes, aircraft wiring changes, and adjustment of maintenance intervals for components. In FY-00 the program will populate the dynamic component model at

Carderock to examine the feasibility of carrying separate loads on the existing CH-53E's three cargo hooks. Once modeled, a prototype system will be designed, fabricated and flown on an aircraft. Additionally, a load matrix will be developed during testing to document which loads are to be carried by selected hook configurations. Also, from FY-99 to FY-05, RDT&E H-53E efforts commence to develop and qualify components to replace obsolete system components and incorporate supportability improvement modifications. The requirement will include identification of candidate architectures for the H-53E avionics suite. Modeling and simulation will be used to the maximum practical extent throughout this effort. In addition, a parallel effort will be required addressing component parts obsolescence, such as the VIR-31, AIC-14, AFCS, 10804 GYRO, etc. To satisfy the requirement, Defense Micro Electronic Agency (DMEA) will be utilized to develop, install and test internal modifications to existing H-53E legacy avionics systems. The modifications will eliminate obsolete and/or unavailable sub-components, while retaining the original basic system footprint and functionality. As part of this effort, a complete electromagnetic vulnerability (EMV) assessment will be required for the affected and/or modified systems.

(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) H2463 - The LAMPS MK III helicopter is deployed in Ticonderoga Class cruisers, Spruance and Kidd Class destroyers, and Perry Class frigates, and provides an all-weather capability for detection, classification, and localization of ships and submarines. LAMPS is an integrated ship-to-helicopter, computer-to-computer weapon system designed to increase and extend the effectiveness of the surface combatant in the performance of its mission. Currently the tie linking the LAMPS helicopter to its host surface ship, is a C-Band frequency directional data link. This data link is the critical interface of the ship-to-helicopter suite because it transfers radar, ESM, IFF and acoustic information both up and down the link. The recent introduction of Cooperative Engagement Capability (CEC) into the fleet has created a major Electro Magnetic Interference (EMI) problem; for it too operates within the C-Band frequency region. Therefore, when CEC is operating, it completely masks the LAMPS data link resulting in loss of information exchange between the ship and helicopter. To resolve this EMI issue, the LAMPS data link is being moved from the C-Band frequency to the KU-Band. Funding supports development of seven test articles.

(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.

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604212N** **PROJECT NUMBER: H1109**
PROGRAM ELEMENT TITLE: ASW & OTHER HELO DEVELOPMENT **PROJECT TITLE: CH/MH-53**

(U) COST: (Dollars in Thousands)

Project Number & Title	FY 1998 Budget	FY 1999 Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete	Total Program
H1109 CH/MH-53	1,163	2,775	4,009	472	2,382	3,024	3,108	3,182	Cont	Cont
TOTAL	1,163	2,775	4,009	472	2,382	3,024	3,108	3,182	Cont	Cont

Quantity of RDT&E Articles

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: From FY-96 through FY-98, 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, in FY-98, the program completes 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 RDT&E, Service Life Assessment Program (SLAP) commences a two year effort on the CH-53D. The Marine Corps Aviation Plan shows the CH-53D remaining in service until 2008. 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 will be a report to identify specific actions required to make CH-53D a supportable, viable weapons system until it is retired from service. The report shall include, at a minimum, identification of airframe structural modification changes, aircraft wiring changes, and adjustment of maintenance intervals for components. In FY-00 the program will populate the dynamic component model at Carderock to examine the feasibility of carrying separate loads on the existing CH-53E's three cargo hooks. Once modeled, a prototype system will be designed, fabricated and flown on an aircraft. Additionally, a load matrix will be developed during testing to document which loads are to be carried by selected hook configurations. Also, from FY-99 to FY-05, RDT&E H-53E efforts commence to develop and qualify components to replace obsolete system components and incorporate supportability improvement modifications. The requirement will include identification of candidate architectures for the H-53E avionics suite. Modeling and simulation will be used to the maximum practical extent throughout this effort. In addition, a parallel effort will be required addressing component parts obsolescence, such as the VIR-31, AIC-14, AFCS, 10804 GYRO, etc. To satisfy the requirement, Defense Micro Electronic Agency (DMEA) will be utilized to develop, install and test internal modifications to existing H-53E legacy avionics systems. The modifications will eliminate obsolete and/or unavailable sub-components, while retaining the original basic system footprint and functionality. As part of this effort, a complete electromagnetic vulnerability (EMV) assessment will be required for the affected and/or modified systems.

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604212N** **PROJECT NUMBER: H1109**
PROGRAM ELEMENT TITLE: ASW & OTHER HELO DEVELOPMENT **PROJECT TITLE: CH/MH-53**

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. FY 1998 ACCOMPLISHMENTS:
- (U) ($ 393) IMD - Final incremental contract payment for completion of IMD-EOA. Initiate Open Architecture Study
- (U) ($ 380) Airframe Fatigue Assessment - Recalculation of airframe fatigue values using most recent flight test and modeling data
- (U) ($ 290) Conduct In-house travel and field activity support funding of IMD program.
- (U) ($ 100) Repair of Repairables (ROR) funded to support SLAP on the H-53E.

2. FY 1999 PLAN:
- (U) ($ 348) Develop corrective actions to replace/modify selected obsolete platform equipment.
- (U) ($ 183) In-house travel and field activities funding to support program.
- (U) ($ 2,237) In-house travel and field activities funding to support "D" SLAP program. This includes having DMEA investigate selected avionics components for microcircuit replacement in a form/fit/function box through reverse engineering. This also includes the reduction of loads data at Warner-Robbins and structures data at Cherry Point as well as modeling fidelity and data correlation at NSWC Carderock.
- (U) ($ 7) Portion of extramural program reserved for Small Business Innovation Research Assessment in accordance with 15 USC 638.

3. FY 2000 PLAN:
- (U) ($ 1,759) In-house travel and field activities funding to support "D" SLAP program. This includes continued investigation/reverse engineering of additional avionics components at DMEA; continued data reduction at Warner-Robbins, Cherry Point and NSWC Carderock; P^3I testing to determine any interference issues; and H-53D interface assessment and bench test assessment evaluation at Cherry Point,
- (U) ($ 2,000) In-house travel and field activities funding to support IELD program. This includes dynamic structures modeling, system design, and prototype development. Flight testing to determine electro environmental effects and document load matrix configuration.
- (U) ($ 250) In-house travel and field activities funding to support program.

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604212N** **PROJECT NUMBER: H1109**
PROGRAM ELEMENT TITLE: ASW & OTHER HELO DEVELOPMENT **PROJECT TITLE: CH/MH-53**

(U) B. PROGRAM CHANGE SUMMARY

	FY 1998	FY 1999	FY 2000
(U) FY 1999 President's Budget:	1,189	2,828	2,934
(U) Appropriated Value:	1,235	2,828	
(U) Adjustments from Pres Budget:	-26	-53	1,075
(U) FY 2000 President's Budget Submit:	1,163	2,775	4,009

CHANGE SUMMARY EXPLANATION:

(U) Funding: The net decrease of $26 thousand in FY 1998 is due to a decrease of $16 thousand for SBIR assessment and $10 thousand for reprogramming action. The net decrease of $53 thousand in FY-99 is due to pricing adjustments. The net increase of $1075 thousand in FY 2000 is due to an increase of $2000 for the CH-53E IELD program and a decrease of $925 thousand for balancing adjustments.

(U) Schedule: MAT/Maint SLAP (1Q/97-3Q/98) was changed to perform unscheduled maintenance resulting from SLAP flight testing due to grounding of H-53s. SLAP contractor test flight commenced 2Q/98. 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/00. The CH-53E effort to develop and qualify components is scheduled for 1Q/99 - 4Q/01. The CH-53E effort to develop an Improved External Lifting Capability (IELD) is scheduled for 1Q-4Q/00.

(U) Technical: Not Applicable

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604212N** **PROJECT NUMBER: H1109**
PROGRAM ELEMENT TITLE: ASW & OTHER HELO DEVELOPMENT **PROJECT TITLE: CH/MH-53**

U) C. OTHER PROGRAM FUNDING SUMMARY: Not Applicable

(U) D. ACQUISITION STRATEGY:

This is a non-ACAT program with no specific acquisition strategies.

(U) E. SCHEDULE PROFILE

	FY 1998	FY 1999	FY 2000	To Complete
(U) Program Milestones		1Q-4Q SLAP CH-53D Airframe/Structural Fatigue Life Limits	1Q-4Q SLAP CH-53D Airframe/Structural Fatigue Life Limits	
(U) Engineering Milestones	1Q-4Q MAT/MAINT SLAP		1Q-2Q Dynamic Structures Modeling 2Q-3Q IELD System Design 3Q-4Q IELD Prototype Dev	
(U) T&E Milestone	3Q-4Q98 IMD EOAT 1Q-4Q SLAP CONTR TESTFLT		3Q-4Q IELD TESTFLT	
(U) Contract Milestones		1Q-4Q CH-53E Develop & Qualify Components	1Q-4Q CH-53E Dev & Qualify Components	1Q-4Q CH-53E Dev & Qualify Components

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604212N** **PROJECT NUMBER: H1109**
PROJECT TITLE: CH/MH-53

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	Cost to Complete	Total Cost	Target Value of Contract
53D/E COMMON ITEMS	MIPR	DMEA/CA		1000	1/99				1000	1000
TECHNICAL SUPPORT	WX	NAWCAD Pax River, MD	783	287	11/98	124	11/99	Cont	Cont	0
TRANSFER OF DMEA PROD	WX	NAVICP Phila., PA						272	272	0
IELD PROTOTYPE	WX	NAWCAD PAX				200	11/99			
Subtotal Project Development			**783**	**1287**		**324**		**Cont**	**Cont**	**Cont**
Remarks										
H-53E (AVIONICS OB)	MIPR	DMEA/CA	0	348	01/99	0		0	348	348
ISRAELI DEF FORCE DATA VIA FMS	WX	NADEP CHPT	0	100	11/98	0		0	100	
MODELING/LOAD DATA ON HH/MHJ	MIPR	WARNER ROBBINS/GA	0	300	05/99	0		0	300	300
IELD DYNAMIC STRUCTURES MODELING	WX	NSWC CARDEROCK	0			500	01/00	0	500	500
MODELING FIDELITY	WX	NSWC CARDEROCK	0	300		0		0	300	0
IELD SYSTEM DESIGN	WX	NAWCAD PAX	0			325	11/99	Cont	Cont	Cont
STRUCTURES DATA ANALYSIS	WX	NADEP Cherry Point,NC	0	150	11/98	0			150	
ADD'L COMPONENTS EFFORT	MIPR	DMEA/CA	0			425	01/00	Cont	Cont	Cont
FUNCTIONAL ASSESSMENT	MIPR	DMEA/CA	0			260	01/00	Cont	Cont	Cont
BENCH TEST/INTERFACE ASSESS	WX	NADEP Cherry Point,NC	0			500	11/99	0	500	0
H-53D INTERFACE ASSESSMENT	WX	NADEP CHPT Cherry Point	0			350	11/99	0	600	0
Subtotal Support			**0**	**1198**		**2360**		**Cont**	**Cont**	**Cont**
Remarks										

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604212N** **PROJECT NUMBER: H1109**
PROJECT TITLE: CH/MH-53

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	Cost to Complete	Total Cost	Target Value of Contract
H-53 E3I Testing	WX	NAWCAD Pax River,MD				100		Cont	Cont	Cont
IELD Flight Testing	WX	NAWCAD Pax River, MD				925				
Subtotal Test & Evaluation			**0**	**0**		**1025**		**Cont**	**Cont**	**Cont**
Remarks										
PMA TRAVEL	WX	NAWCAD Pax River,MD	380	283	11/98	300	11/99	200	Cont	Cont
Subtotal Management			**380**	**283**		**300**		**Cont**	**Cont**	**Cont**
SBIR Assessment				7						
Remarks										
Total Cost			**1163**	**2775**		**4009**		**Cont**	**Cont**	**Cont**

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604212N** **PROJECT NUMBER: H1709**
PROGRAM ELEMENT TITLE: ASW & Other Helo Development **PROJECT TITLE: CH-60S VERTREP**

(U) COST: (Dollars in Thousands)

Project Number & Title	FY 1998 Budget	FY 1999 Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete	Total Program
H1709 CH-60S Vertical Replenishment	0	25,940	19,634	0	0	0	0	0	0	52,484
TOTAL	**0**	**25,940**	**19,634**	**0**	**0**	**0**	**0**	**0**	**0**	**52,484**

Quantity of RDT&E Articles 1

Notes:
FY98 Project Number H2415 includes $29,694 for CH-60S developmental efforts.
FY99 control reflects $13,352 Above Threshold Reprogramming action.
FY00 control includes $11,927 for Airborne Mine Counter Measure efforts.

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The CH-60S Fleet Combat Support (HC) Helicopter provides the Navy with a combat logistics 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 peace keeping/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-60S 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. In the Congressionally-directed demonstration project, Sikorsky has built a prototype CH-60S as a proof-of-concept vehicle. This aircraft was used to conduct a flight demonstration, Integrated Test (IT), and Operational Assessment (OA), including sea trials.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. FY 1998 ACCOMPLISHMENTS: (U) See Project Number H2415.

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604212N** **PROJECT NUMBER: H1709**
PROGRAM ELEMENT TITLE: ASW & Other Helo Development **PROJECT TITLE: CH-60S VERTREP**

2. FY 1999 PLAN:

- (U) ($16,537) Continue developmental efforts on a production representative CH-60S helicopter. Supplies and services include engineering investigations and studies, non-recurring engineering (NRE) and design, common cockpit analyses and integration studies, logistics support, and NRE documentation.
- (U) ($6,300) Complete common cockpit developmental efforts and anticipated pre-operational test efforts.
- (U) ($2,804) Continue Navy field activity systems engineering and test support, program management, and travel.
- (U) ($299) Portion of extramual program reserved for Small Business Innovation Research assessment in accordance with 15 USC 638.

3. FY 2000 PLAN:

- (U) ($6,273) Reconfigure demo aircraft and continue developmental efforts on a production representative CH-60S helicopter. Supplies and services include ground and flight tests, logistics support, NRE documentation, and engineering support for testing.
- (U) ($1,434) Continue Navy field activity program management and travel.
- (U) (11,927) Sikorsky and Navy field Follow-on efforts to the Airborne Mine Countermeasure Program.

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604212N** **PROJECT NUMBER: H1709**
PROGRAM ELEMENT TITLE: ASW & Other Helo Development **PROJECT TITLE: CH-60S VERTREP**

(U) B. PROGRAM CHANGE SUMMARY

	FY 1998	FY 1999	FY 2000
(U) FY 1999 President's Budget:	0	12,775	7,832
(U) Appropriated Value:	0	12,775	0
(U) Adjustments from Pres Budget:	0	+13,165	+11,802
(U) FY 2000 President's Budget Submit:	0	25,940	19,634

CHANGE SUMMARY EXPLANATION:

Note: FY98 funding has been incorporated into project H2415.

(U) Funding –In FY99 the net increase of +$13,165 reflects an ATR increase of $13,352 thousand to fund CH-60S NRE efforts, decreased by a total of - $187 thousand reflecting a Revised Economic Assumption decrease (-$29 thousand), a Contract Advisory and Assistance decrease (-$138 thousand), FFRDC Distribution decrease (-$19 thousand), and a Civilian Personnel adjustment decrease (-$1 thousand). In FY00 the net increase of +$11,802 thousand reflects an increase of +$12,100 for Airborne Mine Counter Measures efforts and a net decrease of -$298 thousand for a balancing adjustment decrease (-$14 thousand) and a Non Pay Inflation adjustment decrease (-$284 thousand).

(U) Schedule – The CH-60S VERTREP FY98 Schedule Profile has been incorporated into project H2415. In FY99 the 4Q 1st Flight, Start Integrated Test was changed due to delay in development efforts and 1Q funds to Army Multi-Year Contract was due to ongoing negotiations with Sikorsky. In FY00 the 4Q Complete Phase III Tow Demo was added to reflect the schedule for AMCM.

(U) Technical - None.

(U) C. OTHER PROGRAM FUNDING SUMMARY

Appn	FY 1998 Budget	FY 1999 Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete
APN-2 CH-60 P1#13 & 14	29,684	137,226	282,285	279,047	393,871	339,975	339,952	339,922	873,592
APN-6 CH-60 Initial Spares	0	4,999	8,381	19,397	17,122	16,186	3,744	8,867	21,323

Related RDT&E -

(U) P.E. 0604212N (CH-60S DEVELOPMENT H2415)
(U) P.E. 0604216N (MULTI-MISSION HELO UPGRADE H1707)

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604212N** **PROJECT NUMBER: H1709**
PROGRAM ELEMENT TITLE: ASW & Other Helo Development **PROJECT TITLE: CH-60S VERTREP**

(U) C. ACQUISITION STRATEGY:

Following the demonstration program, the Navy will contract with Sikorsky to continue non-recurring efforts. An Acquisition Plan and J&A has been approved for this procurement. The contract was awarded in July 1998. The Army will negotiate and incorporate via the "Changes Clause" the CH-60S production ECP into the UH-60L multi-year contract. The production ECP will be incorporated into the multi-year contract on or before March 1999.

(U) D. SCHEDULE PROFILE

	FY 1998	FY 1999	FY 2000	To Complete
(U) Program Milestones				2Q MSIII
(U) Engineering Milestones				
(U) T&E Milestones			1Q - 4Q CT/DT-IIA 3Q-4Q TECHEVAL 4Q 00 - 2Q 01 OT-IIB	1Q-2QOPEVAL
(U) Contract Milestones		2Q Funds to Army Multi-Year Contract LOT I/LRIP	4Q Complete Phase III Tow Demo for AMCM	

FY98 Project Number H2415 includes the schedule for the CH-60S developmental efforts.

EXHIBIT R-3, FY 2000 RDT&E,N COST ANALYSIS | DATE: February 1999

BUDGET ACTIVITY: 5 | PROGRAM ELEMENT: 0604212N | PROJECT NUMBER: H1709 | PROJECT TITLE: CH-60S VERTREP

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	Cost to Complete	Total Cost	Target Value of Contract
CH-60S Prototype Development	SS/FFP	Sikorsky, Stratford, CT	5,749	0	N/A	0	N/A	0	5,749	5,749
Non-Recurring Engineering	SS/CPFF	Sikorsky, Stratford, CT	0	16,537	Nov 98	6,273	Nov 99	0	22,810	22,810
COTS Avionics Technology/H-60 Common Cockpit	845 O/T	Lockeed Martin, Owego, NY	0	6,300	Nov 98	0	N/A	0	6,300	6,300
Misc. In-House Engineering and Logistics	Various	Various	0	457	Nov 98	826	N/A	0	1,283	N/A
Prototype Development for Airborne Mine Counter Measure (AMCM)	SS/FFP	Sikorsky, Stratford, CT	0	0	N/A	9,957	TBD	0	9,957	9.957
AMCM Misc. House Engineering and Logistics	Various	Various	0	0	N/A	910	N/A	0	910	N/A
Subtotal Project Development			**5,749**	**23,294**		**17,966**		**0**	**47,009**	**44,816**
Remarks										
Misc. In-House Engineering and Logistics	Various	Various	50	0	N/A	0	N/A	0	50	N/A
Engineering, Studies, Tech Support	Various	NAWCAD Patuxent River, MD	0	336	Nov 98	0	N/A	0	336	N/A
AMCM Misc. House Engineering and Logistics	Various	Various	0	0	N/A	200	N/A	0	200	N/A
Subtotal Support			**50**	**336**		**200**		**0**	**586**	**0**

EXHIBIT R-3, FY 2000 RDT&E,N COST ANALYSIS DATE: February 1999

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604212N PROJECT NUMBER: H1709 PROJECT TITLE: CH-60S VERTREP

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Misc. Test & Evaluation	Various	Various	12	149	Nov 98	0	N/A	0	161	N/A
Test & Evaluations Engineering	Various	NAWCAD, Patuxent River, MD	0	1,270	Nov 98	0	N/A	0	1,270	N/A
AMCM Test & Evaluations Engineering	Various	NAWCAD, Patuxent River, MD	0	0	N/A	380	N/A	0	380	N/A
Subtotal Test & Evaluation			**12**	**1,419**		**380**		**0**	**1,811**	**0**
Remarks										
Misc. Management Support	Various	Various	36	592	Nov 98	608	Nov 99	0	1,236	N/A
Engineering Support	Various	NAWCAD, Patuxent River, MD	1063	0	N/A	0	N/A	0	1,063	N/A
AMCM Misc. Management Support	Various	Various	0	0	N/A	480	N/A	0	480	N/A
Subtotal Management			**1099**	**592**		**1,088**		**0**	**2,779**	**0**
Remarks										
SBIR Adjustment				**299**					**299**	
Total Cost			**6,910**	**25,940**		**19,634**		**0**	**52,484**	**44,816**

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604212N** **PROGRAM ELEMENT TITLE: ASW & Other Helo Development** **PROJECT NUMBER: H2415** **PROJECT TITLE: CH-60S Development**

(U) COST: (Dollars in Thousands)

Project Number & Title	FY 1998 Budget	FY 1999 Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete	Total Program
H2415 CH-60S Development	29,694	11,972	15,279	13,287	15,744	6,437	5,953	5,448	cont	cont
TOTAL	29,694	11,972	15,279	13,287	15,744	6,437	5,953	5,448	cont	cont

Quantity of RDT&E Articles:

Note: FY 98 reflects CH-60S VERTREP only.
FY 99 reflects both CH-60 VERTREP and AMCM efforts.
FY 00 reflects Airborne Mine Counter Measures (AMCM) efforts

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The mission of the Airborne Mine Countermeasures (AMCM) program designs, develops, integrates and ensure the interoperability of five separate AMCM sensors into the CH-60S helicopter. Included in this effort are: (1) Performance of a three Phase Tow Demonstration to test the suitability of two in-water towed AMCM sensors, the AQS-20 and the Shallow Water Influence Minesweeping System, (2) Design, develop, integrate and ensure the interoperability of a Common AMCM Sensor Console for the CH-60S capable of operating all five AMCM systems, (3) Integrate and ensure the interoperability of all five AMCM sensors into the CH-60S Common Cockpit. (4) Design, develop, integrate and ensure the interoperability of the five AMCM sensors with the CH-60S Automatic Flight Control Computer (AFCC). The CH-60S Fleet Combat Support (HC) Helicopter provides the Navy with a combat logistics at sea capability which is vital to sustain the Navy's power projection forces by a comprehensive and responsive combat logistics force support system.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. FY 1998 ACCOMPLISHMENTS:

- (U) ($16,107) Initiated contract award to Sikorsky for the non-recurring engineering efforts to develop a production representative CH-60S helicopter. Supplies and services include engineering investigations and studies, non-recurring engineering (NRE) and design, common cockpit analyses and integration studies, logistics support, and NRE documentation.

- (U) ($6,334) Awarded to Lockheed Martin a contract for development of a new design common cockpit to be used in both the CH-60S and SH-60R.

- (U) ($2,366) Awarded advisory and assistance services contracts for studies, analyses, and evaluations, professional support services, and engineering and technical services.
- (U) ($4,887) Continued Navy field activity systems engineering and test support, environmental analyses, logistics planning, program management, and travel.

2. FY 1999 PLAN:

- (U) (3,000) Continue developmental efforts on a production representative CH-60S helicopter. Supplies and services include engineering investigations and studies, non-recurring engineering (NRE) and design, common cockpit analyses and integration studies, logistics support, and NRE documentation.
- (U) ($7,806) Perform integration analysis and commence nonrecurring engineering effort supporting the development and integration of the interoperability of the Airborne Mine Counter Measures (AMCM) system into the CH-60S helicopter. Perform Phase II tow test.
- (U) ($364) Advisory and assistance services contracts for studies, analyses and evaluations, professional support services, and engineering and technical services.
- (U) ($506) Continue Navy field activity systems engineering and test support, program management, and travel.
- (U) ($296) Portion of Extramural Program reserved for Small Business Innovation Research Assessment in accordance with 15USC 638.

3. FY 2000 PLAN:

- U) ($14,128) Design, develop, integrate and support the interoperability of a Common AMCM Sensor Console for the CH-60S. Design, develop integrate and support the interoperability of Automatic Flight Control Computer (AFCC) and perform Phase III Tow Test.
- (U) ($635) Advisory and assistance services contracts for studies, analyses and evaluations, professional support services, and engineering and technical services.
- (U) ($516) Continue Navy field activity systems engineering and test support, program management, and travel.

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604212N** **PROJECT NUMBER: H2415**
PROGRAM ELEMENT TITLE: ASW & Other Helo Development **PROJECT TITLE: CH-60S Development**

(U) B. PROGRAM CHANGE SUMMARY

	FY 1998	FY 1999	FY 2000
(U) FY 1999 President's Budget:	30,894	0	0
(U) Appropriated Value:	30,894	12,000	0
(U) Adjustments from Pres Budget:	-1,200	11,972	15,279
(U) FY 2000 President's Budget Submit:	29,694	11,972	15,279

CHANGE SUMMARY EXPLANATION:

(U) Funding The FY 98 net decrease of -$1,200 thousand reflects SBIR (-$852 thousand) and BTR (-$348 thousand) reductions. The FY 99 net increase of $11,972 thousand reflects a congressional plus up for Airborne Mine Counter Measures (AMCM) (+$12,000 thousand) and a decrease for revised economic assumption (-$28 thousand). The net FY 00 increase of +$15, 279 thousand reflects an increase for AMCM Common Console and System Integration (+$15,500 thousand) and a reduction for non-pay inflation (-$221 thousand).

(U) Schedule: In FY98 the 2Q MSII/LRIP change was due to the delay in approval of Operations Requirement Document (ORD) and Acquisition Strategy Report (ASR). In addition, Common Cockpit Critical Design Review (CDR) was moved from 3Q to 4Q FY98 due delays in completing Preliminary Development Review (PDR).

(U) Technical N/A

(U) C. OTHER PROGRAM FUNDING SUMMARY

Appn	FY 1998 Budget	FY 1999 Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete
APN-2 CH-60 P1# 13&14	29,684	137,226	282,285	279,047	393,871	339,975	339,952	339,922	873,592

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604212N** **PROJECT NUMBER: H2415**
PROGRAM ELEMENT TITLE: ASW & Other Helo Development **PROJECT TITLE: CH-60S Development**

Related RDT&E

(U) P.E. 0604212N (CH-60S VERTREP H1709)
(U) P.E. 0604216N (MULTI-MISSION HELO UPGRADE H1707)

(U) C. ACQUISITION STRATEGY: Contract award is planned for March 1999.

(U) D. SCHEDULE PROFILE

	FY 1998	FY 1999	FY 2000	TO COMPLETE
(U) Program Milestones	3Q MSII/LRIP			
(U) Engineering Milestones	4Q Common Cockpit CDR			
(U) T&E Milestones	2Q Complete Demo Test	4Q Complete Phase II Tow Demo	4Q Complete Phase III Tow Demo	
(U) Contract Milestones	4Q NRE CTR Award			

Note: FY 98 reflects CH-60S VERTREP schedule. FY 99 and FY 00 reflects Airborne Mine Countermeasures (AMCM) efforts.

EXHIBIT R-3, FY 2000 RDT&E,N COST ANALYSIS

DATE: February 1999

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604212N

PROJECT NUMBER: H2415

PROJECT TITLE: CH-60S Development

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	Cost to Complete	Total Cost	Target Value of Contract
AMCM NRE & Tow Demo	SS/CPFF	Sikorsky, Stratford, CT	0	7,546	Feb 99	0	N/A	0	7,546	7,546
AMCM Design, Development & Integration	TBD	TBD	0	0	N/A	13,528	TBD	Cont	Cont	Cont
Common Cockpit Development	SS/FFP	Lockheed Martin, Owego, NY	6,334	0	N/A	0	N/A	0	6,334	6,334
AMCM System Integration & Analysis	SS/CPFF	Lockheed Martin Owego, NY	0	260	Feb 99	0	N/A	0	260	260
CH-60S Non-Recurring Engineering	SS/CPFF	Sikorsky, Stratford, CT	16,107	3,000	Apr 99	0	N/A	0	19,107	19,107
Subtotal Project Development			**22,441**	**10,806**		**13,528**		**Cont**	**Cont**	**Cont**
Misc. In-House Engineering and Logistics	Various	Various	2,337	0	N/A	0	N/A	0	2,337	N/A
Engineering, Studies, Tech Support	Various	NAWCAD Patuxent River, MD	1,204	364	N/A	635	N/A	Cont	Cont	N/A
Engineering, Studies & Technical Support	Various	Various	483	166	Jan 99	530	N/A	Cont	Cont	N/A
Subtotal Support			**4,024**	**530**		**1,165**		**Cont**	**Cont**	

EXHIBIT R-3, FY 2000 RDT&E,N COST ANALYSIS

DATE: February 1999

BUDGET ACTIVITY: 5 | PROGRAM ELEMENT: 0604212N | PROJECT NUMBER: H2415 | PROJECT TITLE: CH-60S Development

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	Cost to Complete	Total Cost	Target Value of Contract
AMCM Test & Evaluations Engineering	Various	NAWCAD, Patuxent River, MD	0	300	N/A	0	N/A	0	300	N/A
Misc. Test & Evaluation	Various	Various	634	0	N/A	0	N/A	0	634	N/A
Test & Evaluations Engineering	Various	NAWCAD, Patuxent River, MD	900	0	N/A	0	N/A	0	900	N/A
Subtotal Test & Evaluation			**1,534**	**300**		**0**		**0**	**1,834**	
AMCM Misc. Management Support	Various	Various	0	0	N/A	516	N/A	Cont	Cont	N/A
Misc. Management Support	Various	Various	1,090	40	N/A	70	N/A	50	1,250	N/A
Engineering Support	Various	NAWCAD, Patuxent River, MD	605	0	N/A	0	N/A	0	605	N/A
Subtotal Management			**1,695**	**40**		**586**		**Cont**	**Cont**	
Remarks SBIR Assessment				**296**		**0**		**0**	**296**	
Total Cost			**29,694**	**11,972**		**15,279**		**Cont**	**Cont**	

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604212N** **PROGRAM ELEMENT TITLE: ASW & Other Helo Development** **PROJECT NUMBER: H2463** **PROJECT TITLE: LAMPS MK III DATALINK**

(U) COST: (Dollars in Thousands)

Project Number & Title	FY 1998 Budget	FY 1999* Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete	Total Program
H2463, LAMPS MK III Data Link	0	2,993	9,854	10,852	25,621	0	0	0	0	49,320
TOTAL	0	2,993	9,854	10,852	25,621	0	0	0	0	49,320
Quantity of RDT&E Articles			1	4	2					7

* **Note:** FY 99 estimate includes a congressional transfer of $2.9M from the CEC program for the LAMPS MK III Data Link under Project H2632.

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Light Airborne Multi-Purpose System (LAMPS) MK III helicopter is deployed in Ticonderoga Class cruisers, Spruance and Kidd Class destroyers, and Perry Class frigates, and provides an all-weather capability for detection, classification, and localization of ships and submarines. LAMPS is an integrated ship-to-helicopter, computer-to-computer weapon system designed to increase and extend the effectiveness of the surface combatant in the performance of its mission. Currently the tie linking the LAMPS helicopter to its host surface ship, is a C-Band frequency directional data link. This data link is the critical interface of the ship-to-helicopter suite because it transfers radar, Electronic Support Measures (ESM), Identification Friend or Foe (IFF) and acoustic information both up and down the link. The recent introduction of Cooperative Engagement Capability (CEC) into the fleet has created a major Electro Magnetic Interference (EMI) problem; for it too operates within the C-Band frequency region. In some CEC operating modes, it completely masks the LAMPS data link resulting in loss of information exchange between the ship and helicopter. To resolve this EMI issue, the LAMPS data link is being moved from the C-Band frequency to the KU-Band. This effort will concurrently add integrated data-link connectivity with new generation unmanned aerial vehicles (UAV) thus adding tremendous capability and flexibility to surface combatants while generating large cost avoidances which would otherwise accrue from installing an independent UAV data link system. Funding supports development of seven test articles.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. FY 1998 ACCOMPLISHMENTS: N/A

2. FY 1999 PLAN:

- (U) ($1,550) Nonrecurring Engineering (NRE) for Tactical Common Data Link (TCDL) design. Exercise Defense Advanced Research Projects Agency (DARPA) option for two vendors to develop TCDL prototypes for LAMPS.

- (U) ($516) Develop KU-Band TCDL specifications and initiate effort to integrate KU-Band in Ship/Helo LAMPS Network. Identify changes in SH-60R and SH-60B Prime Item Development Specification and System Segment Specification to incorporate TCDL. Perform Preliminary Design Review (PDR) and Critical Design Review (CDR).
- (U) ($415) Technical services to evaluate vendor proposals and participate in PDR and CDR.
- (U) ($65) Management Support Services, Contract Fees, and Travel.
- (U) ($373) Field Activity Support for integration effort.
- (U) ($74) Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15 USC 638.

3. FY 2000 PLAN:

- (U) ($7,500) Non-recurring Engineering (NRE) to continue development of Tactical Common Data Link (TCDL) via DARPA contract. Perform In-Process Review (IPR).
- (U) ($1,000) Develop Engineering Change Proposal (ECP) to integrate TCDL onto LAMPS air and ship segments.
- (U) ($440) Technical services to review and evaluate vendor progress. Participate in IPR.
- (U) ($60) Program Management and travel.
- (U) ($854) Field Activity Engineering, Testing, and Technical Support.

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604212N** **PROJECT NUMBER: H2463**
PROGRAM ELEMENT TITLE: ASW & Other Helo Development **PROJECT TITLE: LAMPS MK III Data Link**

(U) B. PROGRAM CHANGE SUMMARY

	FY 1998	FY 1999	FY 2000
(U) FY 1999 President's Budget:	0	0	0
(U) Appropriated Value:	0	3,000	0
(U) Adjustments from Pres Budget:	0	2,993	9,854
(U) FY 2000 President's Budget Submit:	0	2,993	9,854

CHANGE SUMMARY EXPLANATION: N/A

(U) Funding: The net increase of $2,993 thousand in FY 1999 is a transfer of $3,000 thousand from the Cooperative Engagement Capability (CEC) Program and a revised economic adjustment of -$7 thousand. The net increase of $9,854 thousand in FY 2000 reflects a program increase of $10,000 thousand, an increase of $12 thousand for civilian pay rates, a decrease of -$143 thousand for non-pay inflation and a decrease of -$15 thousand for the Navy Working Capital Fund.

(U) Schedule:

(U) Technical:

(U) C. OTHER PROGRAM FUNDING SUMMARY

Appn	FY 1998 Budget	FY 1999 Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete	Total Program
OPN BLI 4255 LAMPS MKIII Shipboard Equip	0	0	0	0	0	5,783	29,385	39,126	0	74,294

(U) D. ACQUISITION STRATEGY: PMA-299 plans to exercise an option on a DARPA contract for two vendors to develop a TCDL solution for LAMPS. Upon completion, two vendors will be qualified to compete on a Lockheed Martin Federal Systems (LMFS) proposal to provide TCDL production data links to LAMPS air and ship segments. Lockheed Martin will run the competition to down select and will integrate the TCDL KU-Band Data Link into the LAMPS MK III; aircraft and ships. Production will follow beginning in FY 2003.

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604212N** **PROJECT NUMBER: H2463**
PROGRAM ELEMENT TITLE: ASW & Other Helo Development **PROJECT TITLE: LAMPS MK III Data Link**

(U) E.SCHEDULE PROFILE:

	FY 1998	FY 1999	FY 2000	TO COMPLETE
(U) Program Milestones				
(U) Engineering Milestones		(3Q) PDR (4Q) CDR	(3Q) IPR	
(U) T&E Milestones				DT/OT
(U) Contract Milestones		(3Q) Exercise DARPA Option		Pre-Prod Delivery

EXHIBIT R-3, FY 2000 RDT&E,N COST ANALYSIS | DATE: February 1999

PROJECT NUMBER: H2463
PROJECT TITLE: LAMPS DATALINK

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Engineering Analysis	SS/BOA	LM-Owego NY	0	296	Mar 99	950	Nov 99	1,000	2,246	2,246
Airborne and Ship Interface Studies	SS/BOA	LM-Owego NY	0	220	Mar 99			0	220	220
Hardware and Software Development	SS/TBD	LM-Owego NY	0					8,700	8,700	8,700
Hardware and Software Development	845/TBD	Harris Corp & GEC-Marconi Hazeltine VA	0	750	Feb 99	3,750	N/A	12,000	16,500	16,500
	845/TBD	L-3 Communication Salt Lake City, UT		750	Feb 99	3,750	N/A	12,000	16,500	16,500
Subtotal Product Development			**0**	**2,016**		**8,450**		**33,700**	**44,166**	**44,166**
Product Development Support	MIPR	Defense Advance Research Projects Agency (DARPA), VA	0	50	Feb 99	50	Nov 99	0	100	100
Subtotal Support Costs			**0**	**50**		**50**		**0**	**100**	**100**

EXHIBIT R-3, FY 2000 RDT&E,N COST ANALYSIS DATE: February 1999

PROJECT NUMBER: H2463
PROJECT TITLE: LAMPS DATALINK

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	Cost to Complete	Total Cost	Target Value of Contract
DT/OT	WX	VX-1, NAWCAD Pax	0	0	N/A	0	N/A	425	425	0
Performance Characteristics Testing	RX	NAWCAD, Pax	0	283	Jan 99	754	Nov 99	1148	2,185	2,185
Subtotal Test and Evaluation			**0**	**283**		**754**		**1573**	**2,610**	**2,185**
Engineering & Technical Services	RX	CSCI, VA	0	341	Feb 99	440	Nov 99	880	1,661	1,661
Government Engineering Support	WX	NAWC, St Inigoes	0	90	Feb 99	100	Nov 99	200	390	0
Program Management & Support	RX	NAWCAD, Pax	0	55	Apr 99	40	Nov 99	80	175	175
Travel	WX	NAWCAD, Pax	0	10	Feb 99	20	Nov 99	40	70	0
Subtotal Management			**0**	**496**		**600**		**1,200**	**2,296**	**1,910**
SBIR ASSESSMENT				**74**					**74**	
Total Cost			**0**	**2,993**		**9,854**		**36,473**	**49,320**	**48,261**

EXHIBIT R-2, FY 2000 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5

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

(U) COST: (Dollars in Thousands)

Project Number & Title	FY 1998 Actual	FY 1999 Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete	Total Program
H0652 AV-8B	1,845	2,069	763	13,640	20,479	1,818	9,026	9,041	-	1,553,369
H2634 AV-8B (OSCAR)	8,470	38,353 *	37,836	25,086	6,194	2,196	0	0	-	145,353
TOTAL	**10,315**	**40,422**	**38,599**	**38,726**	**26,673**	**4,014**	**9,026**	**9,041**	**-**	**1,698,722**

Quantity of RDT&E Articles

* This includes a Congressional plus up of $26,800.

(U) A. 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 Munitions (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 components and modular high order language software. OSCAR successfully completed first flight 29 May 1998. On 4 Sep 98, Special Assistant to ASN(RDA) approved OSCAR program restructuring with capitalization on the Advanced Mission Computer and Displays Program (AMC&D). 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.

EXHIBIT R-2a, FY 2000 RDT&E,N PROJECT JUSTIFICATION SHEET

DATE: February 1999

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 1998 Budget	FY 1999 Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete	Total Program
H0652 AV-8B	1,845	2,069	763	13,640	20,479	1,818	9,026	9,041	-	1,553,369
TOTAL	**1,845**	**2,069**	**763**	**13,640**	**20,479**	**1,818**	**9,026**	**9,041**	**-**	**1,553,369**

Quantity of RDT&E Articles

(U) A. 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. 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. The Escape System will qualify a new ejection seat. The Laser Spot Tracker (LST) will provide the capability to deliver laser guided ordnance. The Zero Retention Force solenoid will be integrated to provide safe ordnance jettison. The Tactical Aircraft Moving Map Capability (TAMMAC) is the avionics system that will replace the aging/obsolete AN/ASQ-196 digital map set and the AN/ASQ-194 data storage set presently installed.

(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.

DATE: February 1999

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. FY 1998 ACCOMPLISHMENTS:

- (U) ($1,742) Continue aircraft handling and performance investigations to improve safety and increase operational performance.
- (U) ($103) Orderly termination of all engineering studies/advanced weapons requirements.

2. FY 1999 PLAN:

- (U) ($1,522) Continue aircraft handling and performance investigations to improve safety and increase operational performance.
- (U) ($547) Commence integration of closure algorithm to all Weather Landing Systems Signal (AN/SPN-41) into common operational flight program.

3. FY 2000 PLAN:

- (U) ($93) Continue aircraft handling and performance investigations to improve safety and increase operational performance.
- (U) ($670) Commence design and development of the AV-8B Escape system to qualify a new ejection seat design.

(U) B. PROGRAM CHANGE SUMMARY

	FY 1998	FY 1999	FY 2000
(U) FY 1999 President's Budget:	10,689	13,787	8,027
(U) Appropriated Value:	1,845	2,069	
(U) Adjustments from Pres. Budget:	-8,844	-11,718	-7,264
(U) FY 2000 PRES Budget Submit:	1,845	2,069	763

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604214N** **PROJECT NUMBER: H0652**
PROGRAM ELEMENT TITLE: AV-8B AIRCRAFT **PROJECT TITLE: AV-8B**

CHANGE SUMMARY EXPLANATION:

(U) Funding: The reduction from PRESBUD in FY 1998 of $-8,844 thousand reflects the $-244 thousand for Small Business Innovative Research adjustment, $-130 thousand for minor adjustments, and $-8,470 transferred to OSCAR project number H2634. The net decrease of $-11,718 in FY99 reflects $-103 thousand for minor pricing adjustments and $-11,615 thousand transferred to OSCAR project number H2634. The net decrease of $-7,264 thousand in FY00 reflects $+670 thousand for ejection seat design, $+29,902 for OSCAR program restructuring and $-37,836 thousand transferred to OSCAR project number H2634.

(U) Schedule: N/A

(U) Technical: N/A

(U) C. OTHER PROGRAM FUNDING SUMMARY

Appn.	FY 1998 Budget	FY 1999 Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate
APN-1	293,048	333,754	291,276	198,730	0	0	0	0
APN-5	21,196	86,257	39,126	40,109	29,871	15,288	5,323	1,892
APN-6/Spares	24,024	23,373	13,156	6,376	0	0	0	0

Related RDT&E: N/A

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5 | **PROGRAM ELEMENT: 0604214N** | **PROGRAM ELEMENT TITLE: AV-8B AIRCRAFT** | **PROJECT NUMBER: H0652** | **PROJECT TITLE: AV-8B**

(U) D. ACQUISITION STRATEGY: All efforts under Aircraft Handling provide investigations and analysis of testing and flight clearance authorization necessary to assess overall system capability and integration of projects. Funding is mainly provided on a reimbursable basis to NAWC-AD Patuxent River, MD. Funding plus-up provided by HaRP correction (PBD 752) in FY00 for the Escape System will qualify a new ejection seat design and will be placed on a cost plus fixed fee contract awarded to BF Goodrich. Funding plus-up in FY00 and FY01 provided by HaRP correction (PBD 752) for the Laser Spot Tracker (LST) will be placed on a cost plus fixed fee contract awarded to GEC Marconi to integrate the LST into the AV-8B to provide the capability of delivering laser-guided ordnance. Funding plus up in FY02 provided by HaRP correction (PBD 752) for the Zero Retention Force solenoid will be placed on a cost plus fixed fee contract awarded to Hughes to integrate the solenoid to provide safe ordnance jettison. Using the JSSA cost plus award fee contract to Boeing, funds for the avionics system Tactical Aircraft Moving Map Capability (TAMMAC) will replace the aging/obsolete AN/ASQ-196 digital map set and the AN/ASQ-194 data storage set presently installed.

(U) E. SCHEDULE PROFILE: TBD

EXHIBIT R-3, FY 2000 RDT&E,N COST ANALYSIS

DATE: February 1999

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604214N

PROJECT NUMBER: H0652

PROJECT TITLE: AV-8B

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Project Development	WX	NAWC-WD, CHLK, CA	19,189	0		0		15,276	34,465	
Project Development	Various	Miscellaneous	6,242	1,255	10/98	0		3,622	11,119	
Project Development	Various	In-house	3,738	270	10/98			1,420	5,428	
Contracts	Various	Miscellaneous	8,887	0		0			8,887	8,887
Contract- Ejection Seat		BF Goodrich				670			670	
Contracts- Laser Spot Tracker		GEC Marconi						8,379	8,379	
Contracts		Hughes						4,740	4,740	
Logistics								2,986	2,986	
Contracts	Various	Boeing	5,690	0		0		13,051	18,741	18,741
Award Fee	Various	Boeing	563					1,370	1,933	
Other FY98 & Prior Costs	Various	Various	1,355,159						1,355,159	
Subtotal Project Development			**1,399,468**	**1,525**		**670**		**50,844**	**1,452,507**	
Remarks:										
Support and Management Misc./Contracts	RX	NAWC-AD, PATUXENT RIVER, MD	1,535	220	10/98	93	10//99	625	2,473	
S&M	WX	Various	43,538						43,538	
S&M Misc./In-house	Various	Various	1,000						1,000	
Subtotal Support			**46,073**	**220**		**93**		**625**	**47,011**	
Remarks										

EXHIBIT R-3, FY 2000 RDT&E,N COST ANALYSIS

DATE: February 1999

BUDGET ACTIVITY: 5 | PROGRAM ELEMENT: 0604214N | PROJECT NUMBER: H0652 | PROJECT TITLE: AV-8B

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	Cost to Complete	Total Cost	Target Value of Contract
T&E	WX	NAWC-WD, CHLK, CA	8,758	0		0		2,535	11,293	
	WX	Miscellaneous	42,234	324	10/98	0		0	42,558	
Subtotal Test & Evaluation			**50,992**	**324**	**0**	**0**		**2,535**	**53,851**	
Remarks										
Subtotal Management				**0**		**0**		**0**	**0**	
Remarks										
Total Cost			**1,496,533**	**2,069**		**763**		**54,004**	**1,553,369**	

EXHIBIT R-2a, FY 2000 RDT&E,N PROJECT JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5

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

PROJECT NUMBER: H2634
PROJECT TITLE: AV-8B (OSCAR)

(U) COST: (Dollars in Thousands)

Project Number & Title	FY 1998 Budget	FY 1999 Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete	Total Program
H2634 AV-8B (OSCAR)	8,470	38,353 *	37,836	25,086	6,194	2,196	0	0	-	145,353
TOTAL	**8,470**	**38,353**	**37,836**	**25,086**	**6,194**	**2,196**	**0**	**0**	**-**	**145,353**

Quantity of RDT&E Articles

* This includes a Congressional plus up of $26,800.

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The title of the Operational Flight Program (OFP) software development effort which integrates the Joint Direct Attack Munitions (JDAM) and the Common Missile Warning System (CMWS) into the AV-8B was changed from C2.0 to OC 1.2 to reflect the change of effort in accordance with the ASN(RDA) 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 Open System Core Avionics Requirement (OSCAR) initiative. OSCAR utilizes commercial components and modular high order language software. OSCAR successfully completed first flight 29 May 1998. On 4 Sep 98, Special Assistant to ASN(RDA) approved OSCAR program restructuring with capitalization on the Advanced Mission Computer and Displays Program (AMC&D). 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.

(V) 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.

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5 | **PROGRAM ELEMENT: 0604214N** | **PROGRAM ELEMENT TITLE: AV-8B AIRCRAFT** | **PROJECT NUMBER: H2634** | **PROJECT TITLE: AV-8B (OSCAR)**

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. FY 1998 ACCOMPLISHMENTS:

- (U) ($8,470) Continue the Open Systems Core Avionics Requirements (OSCAR) initiative replacing the Mission Computer and Stores Management System with Commercial components and continue development of the common integrated Night Attack/Radar software to include integration of the 1000lb Joint Direct Attack Munitions (JDAM) weapon.

2. FY 1999 PLAN:

- (U) ($829) Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15 USC 638.
- (U) ($2,000) Commence integration and test software to the ARC-210 HAVEQUICK and SINCGARS waveform full functionality.
- (U) ($35,524) Continue the Open Systems Core Avionics Requirements (OSCAR) initiative replacing the Mission Computer and Stores Management System with Commercial off the shelf processors and memory; and continue development of the common integrated Night Attack/Radar software to include integration of the 1000lb Joint Direct Attack Munitions (JDAM) weapon.

3. FY 2000 PLAN:

- (U) ($1,934) Continue integration and test software to the ARC-210 HAVEQUICK and SINCGARS waveform full functionality.
- (U) ($35,902) Continue the Open System Core Avionics Requirements (OSCAR) initiative replacing the Mission Computer and Stores Management System with Commercial components and continue development of the common integrated Night Attack/Radar software to include integration of the 1000lb Joint Direct Attack Munitions (JDAM) weapon.

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604214N** **PROJECT NUMBER: H2634**
PROGRAM ELEMENT TITLE: AV-8B AIRCRAFT **PROJECT TITLE: AV-8B (OSCAR)**

(U) B. PROGRAM CHANGE SUMMARY

	FY 1998	FY 1999	FY 2000
(U) FY 1999 President's Budget:	0	0	0
(U) Appropriated Value:	8,470	38,353	37,836
(U) Adjustments from Pres. Budget:	+8,470	+38,353	+37,836
(U) FY 2000 PRES Budget Submit:	8,470	38,353	37,836

CHANGE SUMMARY EXPLANATION:

(U) Funding: The increase in FY 1998 of $8,470 reflects a transfer from AV-8B, project number H0652. The net increase of $+38,353 thousand in FY 1999 reflects a congressional plus up of $26,800 thousand for the OSCAR effort and a decrease of $-62 thousand for minor pricing adjustments and an increase of $11,615 thousand transferred from AV-8B, project number H0652. The net increase of $+37,836 thousand in FY 2000 reflects additional funding for the OSCAR program restructuring.

(U) Schedule: Schedule changes reflect OSCAR program restructuring approved 4 SEP 98 by Special Assistant to ASN(RDA).

(U) Technical: N/A

(U) C. OTHER PROGRAM FUNDING SUMMARY

Appn.	FY 1998 Budget	FY 1999 Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate
APN-1	6,127	0	0	0	0	0	0	0
APN-5	2,836	0	0	0	28,260	21,830	26,125	28,584
APN-6/Spares	700	1,000	3,300	2,000	0	0	0	0

DATE: February 1999

BUDGET ACTIVITY: 5 | **PROGRAM ELEMENT: 0604214N** | **PROGRAM ELEMENT TITLE: AV-8B AIRCRAFT** | **PROJECT NUMBER: H2634** | **PROJECT TITLE: AV-8B (OSCAR)**

Related RDT&E

(U) P.E. 0604805 D8Z, Commercial O&S Savings Initiative (COSSI).

(U) D. ACQUISITION STRATEGY: PEO(A) ADM Ser DPEO(A)-ACQ2/015-97 dated 6 March 1997 approves the MSII acquisition strategy for OSCAR as an ACAT IVT program. OSCAR avionics CDR was held in January 1998 and successfully completed first flight 29 May 1998. Using the JSSA CPAF contract, funds will be used for basic design definition, drawing development, and OFP development and test. Four Mission System Computers and four Warfare Management Computer engineering models have been procured for bench validation. The JSSA/Boeing follow-on CPAF Contract was awarded on 16 December 1998. The period of performance will be for five years based on the need to complete Open System Core Avionics Requirement (OSCAR) and begin OC1.3. The ARC-210 will integrate a full electronic protection radio using the Army and Air Force developed waveform (UHF-AM HAVEQUICK/VHF-FM SINCGARS) using the JSSA/Boeing FY98 contract.

(U) E. SCHEDULE PROFILE:

	FY 1998	FY 1999	FY 2000	To Complete
(U) Program Milestones				OC1.1 MS III
(U) Engineering Milestones			1Q OC1.1 Begin Integration Test	OC1.2 Begin Integration Test
(U) T&E Milestones				OC1.1OT Complete FOT&E Complete
(U) Contract Milestones		1Q Follow On For OC1.1/OC1.2		

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604214N** **PROJECT NUMBER: H2634**

PROJECT TITLE: AV-8B (OSCAR)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Project Development	WX	NAWC-WD, CHLK, CA	13,146	5,249	10/98	6,667	10/99	6,281	31,343	
Project Development	WX	NAWC-AD, Patuxent, MD	0	231	12/98	570	10/99	1,500	2,301	
Project Development	Various	PMA-209				3,000	10/99	2,000	5,000	
Contracts	Various	Boeing	15,395	25,545	12/98	20,275	12/98	11,339	72,554	72,554
Award Fee	Various	Boeing	1,522	2,691		2,128		1,190	7,531	
Subtotal Project Development			**30,063**	**33,716**		**32,640**		**22,310**	**118,729**	
Remarks:										
Support and Management			0	0		0		0	0	
Misc./Contracts										
S&M			0	0		0		0	0	
S&M Misc./In-house			0	0		0		0	0	
Subtotal Support			**0**	**0**		**0**		**0**	**0**	
Remarks										
T&E	WX	NAWC-WD, CHLK, CA	5,625	3,808		5,196		11,166	25,795	
Subtotal Test & Evaluation			**5,625**	**3,808**		**5,196**		**11,166**	**25,795**	
Remarks										
Subtotal Management				**0**		**0**		**0**	**0**	
Remarks										
SBIR Assessment				**829**					**829**	
Total Cost			**35,688**	**38,353**		**37,836**		**33,476**	**145,353**	

EXHIBIT R-2, FY 2000 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604215N**
PROGRAM ELEMENT TITLE: Standards Development

(U) COST: (Dollars in Thousands)

Project Number & Title	FY 1998 Budget	FY 1999 Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Complete	To Program	Total
S1857 Calibration Standards	1,886	1,790	1,578	1,564	1,752	1,820	1,866	1,913	CONT.	CONT.
S2416 Integrated Condition Assessment System (ICAS)	1,886	0	0	0	0	0	0	0	0	1,864
E2310 Flight Polynomials	281	292	287	0	0	0	0	0	0	860
E2311 Stores Planning and Weaponeering Module	6,334	7,271	7,432	7,812	8,493	779	811	842	CONT.	CONT.
E2312 Common Helicopters	0	452	1,442	1,975	2,766	1,213	1,253	1,290	CONT.	CONT.
W0572 Joint Services/Navy Standard Avionics Components and Subsystems	24,657	41,006	63,586*	76,991*	50,223*	25,687*	18,095*	12,147*	CONT.	CONT.
TOTAL	**35,044**	**50,811**	**74,325**	**88,342**	**63,234**	**29,499**	**22,025**	**16,192**	**CONT.**	**CONT.**
Quantity of RDT&E Articles	3	49	122	69	46	0	0	0	0	289

(U) A. 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.

(U) Project E2310, Flight Polynomials: The Tactical Automated Mission Planning System (TAMPS) is the CNO designated common automated mission planning system for the Navy. One of the fundamental planning functions of any automated aviation mission planner is the ability to calculate fuel required and performance available corrected for both the aircraft's configuration (weight, drag, speed, etc.) and the environmental factors (altitude, wind, pressure, humidity, etc.) In order to provide accurate performance calculations, performance polynomials (drop-in polynomials) reflecting the performance delineated in the approved NATOPS manuals must be developed, implemented and maintained for each supported type/model/series aircraft. The following type/model/series aircraft are supported by this PE: F/A-18 (400), F/A-18 (402), C-2R, E-2C (Block II), F-14 B/D, AH-1W, UH-1N, CH-46E, H-60F/H, S-3B, EA-6B, AV-8B (406), AV-8 (408), T-45, and KC-130 F/R/T. The developed drop-in performance polynomials will initially be implemented in Naval Portable Flight Planning Software (N-PFPS).

*The increase in this Project Unit is from PE 0604574N – Navy Tactical Computer Resources, Project Unit W0845 – AN/AYK-14 and POM 00 increase for AMC&D to support hardware processing for F/A-18E/F Tactical F requirements. Project Unit W0845 is combined with PE 0604215N, Project Unit W0572 beginning FY00. With this combination, Flight Avionics Displays (FAD) becomes Advanced Mission Computer and Displays (AMC&D).

DATE: February 1999

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604215N
PROGRAM ELEMENT TITLE: Standards Development

(U) Project E2311, Stores Planning and Weaponeering Module: The Navy Stores Planning and Weaponeering (NSPW) application is an incrementally developed software product that will provide a certified unit level weaponeering capability for Navy aircraft in the Joint Mission Planning Segment (JMPS). NSPW will provide current planning results for specific aircraft type and model that include store/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 Windows NT environment and integrated with Joint Munitions Effectiveness Manual (JMEM) software, and mission planning functions to comprise NSPW. F/A-18A/B/C/D is the first platform to be introduced in the first increment of NSPW as a stand alone product.

(U) Project E2312, Common Helicopters: The Tactical Automated Mission Planning System (TAMPS) is the CNO designated common automated mission planning system for the Navy. Automated mission planning systems to date have been developed targeting the planning requirements for fixed-wing aircraft, while the unique planning requirements for helicopters have not been addressed. The unique and enhanced automated mission planning requirements that must be developed and implemented for helicopters include: data loading, an enhanced route editor (serpentine routing, hover, etc.) manipulation of higher fidelity (smaller scale) maps and imagery, enhanced performance tools (performance in and out of ground effect, performance degradation due to atmospheric conditions & elevation), and enhanced fidelity of threat analyses. The following type/model/series aircraft are supported by this PE: AH-1W, UH-1N, H-46D/E, H-53D/E, H-60B/F/H/R, and V-22. The developed common helicopter functionality will initially be implemented in Naval Portable Flight Planning Software (N-PFPS). The fully developed and Fleet released common helicopter functionality will migrate to the Joint Mission Planning Segment (JMPS) after JMPS initial fielding.

(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, safety systems, 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 chairmanship and participation in the Joint Services Review Committee (JSRC) for Avionics Standardization. The RDT&E Articles include Tactical Aircraft Moving Map Capability (TAMMAC) Engineering & Manufacturing Development (E&MD) units, Communication Navigation Surveillance/Air Traffic Management (CNS/ATM) E&MD units, Advanced Mission Computer & Displays (AMC&D) E&MD units which include Display Processors and Mission Processors, Display Heads, 8 x 10 displays, Fiber Channel Switches, and technology roll kits.

(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.

DATE: September 1998

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604215N PROGRAM ELEMENT TITLE: STANDARDS DEVELOPMENT PROJECT NUMBER: S1857 PROJECT TITLE: CALIBRATION STANDARDS

(U) COST: (Dollars in Thousands)

Project Number & Title	FY 1998 Budget	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete	Total Program
S1857 CALIBRATION STANDARDS	1,886	1,790	1,578	1,564	1,752	1,820	1,866	1,913	CONT.	CONT.
TOTAL	1,886	1,790	1,578	1,564	1,752	1,820	1,866	1,913	CONT.	CONT.

Quantity of RDT&E Articles

(U) A. 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. FY 1998 ACCOMPLISHMENTS:

(U) ($0.580) Completed the development of 2 calibration standards (hardware) in support of Joint Service Automation and radars (2GHz) to millimeter-wave).

(U) ($0.981) Began and completed development of 4 calibration standards (hardware) in support of fiber optic communications systems (2 standards), shipboard sensors, and high current circuit breakers.

(U) ($0.325) Began development (to 50% completion) of 2 calibration standards (hardware) in support of laser tracker systems, and system electromagnetic vulnerability measurements.

2. FY 1999 PLAN:

(U) ($0.198) Complete the development of 1 calibration standard (hardware) in support of system electromagnetic vulnerability measurement.

(U) ($0.252) Continue development (to 66% completion) of 1 calibration standard (hardware) in support of laser tracking systems.

(U) ($1.340) Begin development (to 50% completion) of 6 calibration standards (hardware) in support of target designators laser, underwater acoustic systems, Infrared (1.52 u) systems, optical systems, radar measurements, and multi-function electrical test equipment.

3. FY 2000 PLAN:

(U) ($0.839) Complete the development of 3 calibration standards (hardware) in support of target designators, laser tracker systems and radar measurements.

(U) ($1.739) Continue development (to 66% completion) of 4 calibration standards (hardware) in support of underwater acoustic systems, Infrared (1.52 u) systems, optical systems, and multi-function electrical test equipment.

4. FY 2001 PLAN:

(U) ($0.854) Complete development of 4 calibration standards (hardware) in support of underwater acoustic systems, Infrared (1.52 u) systems, and optical systems and mullti-function electrical test equipment.

(U) ($0.710) Begin development (to 33% completion) of 3 calibration standards (hardware) in support of shipboard pressure gauges, aircraft and shipboard electronic system maintenance , and fiber optic communication systems.

(U) ($0.504) Begin development (to 33% completion of 6 calibration standards (hardware) in support of microwave systems and fiber optic communication systems.

DATE: September 1998

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604215N** **PROJECT NUMBER: S1857**
PROGRAM ELEMENT TITLE: STANDARDS DEVELOPMENT **PROJECT TITLE: CALIBRATION STANDARDS**

(U) B. PROGRAM CHANGE SUMMARY

	FY 1998	FY 1999	FY 2000	FY 2001
(U) FY 1999 President's Budget:	1.886	1.790	1.578	1.564
(U) Appropriated Value:	1.905			
(U) Adjustments from Pres Budget:				
a. Minor Pricing Adjustments	-0.019	-0.009	- 0.084	- 0.093
(U) FY 2000/2001 OSD/OMB Budget Submit:	1.904	1.799	1.662	1.566

CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1998 reduction of $0.019M, FY 2000 reduction of $0.009M, and FY 2001 reduction of $0.091M are due to minor pricing adjustments.

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

(U) C. OTHER PROGRAM FUNDING SUMMARY

Appn	FY 1998 Budget	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete

Not applicable.

Related RDT&E

(U) P.E. 0604215N Joint Services/Navy Standard Avionics Components and Subsystems

DATE: September 1998

BUDGET ACTIVITY: 5 | PROGRAM ELEMENT: 0604215N | PROGRAM ELEMENT TITLE: STANDARDS DEVELOPMENT | PROJECT NUMBER: S1857 | PROJECT TITLE: CALIBRATION STANDARDS

(U) C. ACQUISITION STRATEGY: Not applicable.

(U) D. SCHEDULE PROFILE: Not applicable.

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Program Milestones				
(U) Engineering Milestones				
(U) T&E Milestones				
(U) Contract Milestones				

EXHIBIT R-3, FY 2000/2001 RDT&E,N COST ANALYSIS

DATE: September 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604215N

PROJECT NUMBER: S1857

PROJECT TITLE: CALIBRATION STANDARDS

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Primary Hardware Development		NSWC NWAS	1.296	1.210	10/98	1.035	10/99	0.993	10/00	CONT.	CONT.	
Subtotal Project Development			**1.296**	**1.210**		**1.035**		**0.993**		**CONT.**	**CONT.**	

Remarks
Naval Surface Warfare Center (NSWC)
Naval Warfare Assessment Station
(NWAS)
Total Prior Yrs Cost = FY98 only

Subtotal Support			**0**	**0**		**0**		**0**		**0**	**0**	

Remarks

EXHIBIT R-3, FY 2000/2001 RDT&E,N COST ANALYSIS

DATE: September 1998

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604215N

PROJECT NUMBER: S1857

PROJECT TITLE: CALIBRATION STANDARDS

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Subtotal Test & Evaluation			**0**	**0**		**0**		**0**		**0**	**0**	
Remarks												
Government Engineering Support		NSWC NWAS	0.235	0.223	10/98	0.210	10/99	0.202	10/00	CONT.	CONT.	
Program Management Support		NSWC NWAS	0.329	0.337	10/98	0.313	10/99	0.349	10/00	CONT.	CONT.	
Travel		NSWC NWAS	0.026	0.020	10/98	0.020	10/99	0.020	10/00	CONT.	CONT.	
Subtotal Management			**0.608**	**0.583**		**0.496**		**0.479**		**CONT.**	**CONT.**	
Remarks Naval Surface Warfare Center (NSWC) Naval Warfare Assessment Station (NWAS) Total Prior Yrs Cost = FY98 only												
Total Cost			**1.886**	**1.790**		**1.578**		**1.564**		**CONT.**	**CONT.**	

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604215N
PROGRAM ELEMENT TITLE: Standards Development

(U) COST: (Dollars in Thousands)

Project Number & Title	FY 1998 Budget	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete	Total Program
E2310 Flight Polynomials *	**281**	**292**	**287**	**0**	**0**	**0**	**0**	**0**	**0**	**860**

Quantity of RDT&E Articles

* Previously funded under W2310.

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Tactical Automated Mission Planning System (TAMPS) is the CNO designated common automated mission planning system for the Navy. One of the fundamental planning functions of any automated aviation mission planner is the ability to calculate fuel required and performance available corrected for both the aircraft's configuration (weight, drag, speed, etc.) and the environmental factors (altitude, wind, pressure, humidity, etc.) In order to provide accurate performance calculations, performance polynomials (drop-in polynomials) reflecting the performance delineated in the approved NATOPS manuals must be developed, implemented and maintained for each supported type/model/series aircraft. The following type/model/series aircraft are supported by this PE: F/A-18 (400), F/A-18 (402), C-2R, E-2C (Block II), F-14 B/D, AH-1W, UH-1N, CH-46E, H-60F/H, S-3B, EA-6B, AV-8B (406), AV-8 (408), T-45, and KC-130 F/R/T. The developed drop-in performance polynomials will initially be implemented in Naval Portable Flight Planning Software (N-PFPS).

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1998 ACCOMPLISHMENTS:
   - (U) ($281) The development, certification, and software release of drop-in performance polynomials were commenced. Performance polynomials were developed for: F/A-18 (400), F/A-18 (402), C-2R, E-2C (Block II), CH-46E, AH-1W, H-60F/H, and UH-1N.

2. (U) FY 1999 PLAN:
   - (U) ($292) Continue the development, certification, and release of drop-in performance polynomials. The following performance polynomials are scheduled: F-14B/D, F/A-18E/F, S-3B, EA-6B, T-45, and H-53E.

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604215N**
PROGRAM ELEMENT TITLE: Standards Development

(U) PROGRAM ACCOMPLISHMENTS AND PLANS: (continued)

3. (U) FY 2000 PLAN:
   - (U) ($287) Continue the development, certification, and release of drop-in performance polynomials. The following performance polynomials are scheduled: KC-130F/R/T, V-22, KC-130J, AV-8B (406), AV-8B (408), and P-3C.

(U) B. PROGRAM CHANGE SUMMARY

	FY 1998	FY 1999	FY 2000
(U) FY 1999 President's Budget:	289	293	291
(U) Appropriated Value:	298	293	
(U) Adjustments from President's Budget:	-8	-1	-4
(U) FY 2000 President's Budget Submit:	281	292	287

CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1998 decrease reflects an -$8 thousand decrease for an SBIR Reduction.

FY 1999 decrease reflects a -$1 thousand decrease for Revised Economic Assumptions.

FY 2000 decrease reflects a -$4 thousand decrease for minor inflation adjustments.

(U) Schedule: Not Applicable

(U) Technical: Not Applicable

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604215N**
PROGRAM ELEMENT TITLE: Standards Development

(U) C. OTHER PROGRAM FUNDING SUMMARY

Appn	FY 1998 Budget	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete
OPN	15,280	23,529	20,769	15,480	19,078	13,621	13,336	14,342	CONT.

Related RDT&E

(U) P.E. 0604231N Mission Planning (E2213)

(U) D. ACQUISITION STRATEGY: This is a co-operative development between the USN and USAF.

(U) E. SCHEDULE PROFILE

	FY 1998	FY 1999	FY 2000	To Complete
(U) Program Milestones	2Q/98 3.0 Release	2Q/99 3.1 Release	2Q/00 3.2 Release	2Q/01 3.3 Release
(U) Engineering Milestones				
(U) T&E Milestones				
(U) Contract Milestones				

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604215N
PROGRAM ELEMENT TITLE: Standards Development

PROJECT NUMBER: E2311
PROJECT TITLE: Stores Planning and Weaponeering Module

(U) COST: (Dollars in Thousands)

Project Number & Title	FY 1998 Budget	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete	Total Program
E2311 Stores Planning Weaponeering Module *	6,334	7,271	7,432	7,812	8,493	779	811	842	CONT.	CONT.
TOTAL	6,334	7,271	7,432	7,812	8,493	779	811	842	CONT.	CONT.

Quantity of RDT&E Articles

* Previously funded under W2311

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Navy Stores Planning and Weaponeering (NSPW) application, previously known as Stores Planning and Weaponeering Module (SPWM), is an incrementally developed software product that will provide a certified unit level weaponeering capability for Navy aircraft in the Joint Mission Planning Segment (JMPS). NSPW will provide current planning results for specific aircraft type and model that include store/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 Windows NT environment and integrated with Joint Munitions Effectiveness Manual (JMEM) software, and mission planning functions to comprise NSPW. F/A-18A/B/C/D is the first platform to be introduced in the first increment of NSPW as a standalone product.

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5 | **PROGRAM ELEMENT: 0604215N** | **PROGRAM ELEMENT TITLE: Standards Development** | **PROJECT NUMBER: E2311** | **PROJECT TITLE: Stores Planning and Weaponeering Module**

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1998 ACCOMPLISHMENTS:
   - (U) ($6,334) Using Object Oriented software design methodology, completed Conceptualization Phase for NSPW standalone product. During Conceptualization Phase held Fleet reviews and assessed Fleet requirements, developed software prototypes including Human Machine Interface (HMI) prototype and engineering prototype for communication interfaces, developed NSPW documentation (Concept of Operations, Quality Assurance Plan, Systems/Subsystems Specification, draft Configuration Management Plan, draft Software Development Plan), established NSPW software development lab, became proficient in software development tool usage, completed first phase risk assessment, analyzed HMI software tools, and participated in JMPS technical interchanges. Began NSPW Elaboration Phase: conducted Fleet review and analyzed Fleet inputs; specified NSPW's context, functions, and scenarios; elaborated NSPW's scenarios (sequence diagrams) and completed a draft of the system's domain model (key classes and their relationships); began scenario walkthroughs. Released Automated Tactical Manual Supplement (ATACS) version 1.2. Began ATACS version 2.0 requirements definition, completed software builds, conducted Internal Test Readiness Review (ITRR), External Test Readiness Review (ETRR), and began Certification Testing.

2. (U) FY 1999 PLAN:
   - (U) ($7,150) Continue NSPW Elaboration Phase begun in FY98 by completing scenario walkthroughs, updating risk assessment, preparing and conducting F/A-18A/B/C/D Elaboration Status Review, and participating in JMPS technical interchanges. Complete the system's domain model. Begin NSPW design: hold Fleet Review and assess Fleet input, conduct architectural planning by allocating layers and partitions of the NSPW architecture, creating the Architectural Prototype, creating the Architectural Baseline, and identifying the risk of each key architectural interface. Initiate Tactical Design by selecting the major mechanisms and idioms. Perform Release Planning by prioritizing scenarios, grouping scenarios into iterations, and creating a task plan; conduct a status review, participate in JMPS technical interchanges, prepare and present the Design Review. Enter NSPW Construction Phase by beginning Construction Iterations. Complete ATACS version 2.0 Certification Testing, hold Technical Information Review Board (TIRB) and Release Board, duplicate and distribute CDs. Begin development of ATACS version 2.1.

   - (U) ($121) Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15 USC 638.

3. (U) FY 2000 PLAN:
   - (U) ($7,432) Continue Standalone F/A-18 NSPW Construction Phase. Begin analysis and design of load capability for CH-46, CH-53, HH-60H, KC-130, T-45, UH-1 and V-22 aircraft. Complete development and release F/A-18 ATACS version 2.1. Begin conceptualization and transition phases for full capability for AH-1 and AV-8D aircraft.

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604215N** **PROJECT NUMBER: E2311**
PROGRAM ELEMENT TITLE: Standards Development **PROJECT TITLE: Stores Planning and Weaponeering Module**

(U) B. PROGRAM CHANGE SUMMARY

	FY 1998	FY 1999	FY 2000
(U) FY 1999 President's Budget:	7,451	7,295	7,559
(U) Appropriated Value:	7,679	7,295	
(U) Adjustments from President's Budget:	-1,117	-24	-127
(U) FY 2000 President's Budget Submit:	6,334	7,271	7,432

CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1998 net decrease of -$1,117 reflects a decrease of -$875 thousand for a Below Threshold Reprogramming and a decrease of -$242 thousand for a SBIR Reduction.

FY 1999 net decrease of -$24 thousand reflects minor pricing adjustments.

FY 2000 net decrease of -$127 thousand reflects minor pricing adjustments.

(U) Schedule: Not Applicable

(U) Technical: Not Applicable

(U) C. OTHER PROGRAM FUNDING SUMMARY

Appn	FY 1998 Budget	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete
OPN	15,280	23,529	20,769	15,480	19,078	13,621	13,336	14,342	CONT.

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5 | **PROGRAM ELEMENT: 0604215N** | **PROGRAM ELEMENT TITLE: Standards Development** | **PROJECT NUMBER: E2311** | **PROJECT TITLE: Stores Planning and Weaponeering Module**

Related RDT&E

(U) P.E. 0604231N Mission Planning (E2213)

(U) D. ACQUISITION STRATEGY: Navy Stores Planning and Weaponeering (NSPW) software applications are being built by a software development team composed of government and contractor entities. Domain expertise in the areas of platform specific stores compatibility and weapons separation, load validation, drag counts, fuzing, delivery and safe escape, unguided trajectory modeling, guided weapons models, weapon effects, and aerodynamic flutter is provided by engineers to advise a software development team comprised of USG and contractor software developers. NSPW management and the test team for IV&V and Certification Testing are also combined teams of USG and contractor entities. Contractor efforts are procured predominately through fixed-price GSA or BPA contracts.

(U) E. SCHEDULE PROFILE

	FY 1998	FY 1999	FY 2000
(U) Program Milestones	3Q/98 Proj Definition Review	1Q/99 Iteration 1 Review 2 Q/99Sys Architecture Review 3Q/99 Iteration 2 Review 3Q/99 Iteration 3 Review 4 Q/99 Construction Readiness Review	2Q/00 Iteration 4 Review 4Q/00 Iteration 5 Review
(U) Engineering Milestones	2 Q/98 Conceptualization 3Q/98 Conceptualization 3Q/98 Elab. Phase 4Q/98 Elab. Phase	1 Q/99 Elab. Phase 2 Q/99 Elab. Phase 3 Q/99 Elab. Phase 4 Q/99 Elab. Phase	1 Q/00 Construction Phase 2 Q/00 Construction Phase 3 Q/00 Construction Phase 4 Q/00 Construction Phase
(U) T&E Milestones			2 Q/00 FQT Iteration 3 Q/00 Certification Iterations
(U) Contract Milestones	1 Q/98 DCS GSA 1 Q/99 Contract Award	2 Q/99 DCS GSA 2 Q/99 Contract Award	1 Q/00 DCS GSA 1 Q/00 Contract Award

EXHIBIT R-3, FY 2000 RDT&E,N COST ANALYSIS

DATE: February 1999

BUDGET ACTIVITY: 5 | PROGRAM ELEMENT: 0604215N | PROJECT NUMBER: E2311 | PROJECT TITLE: Stores Planning

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Software Development	WX	NAWCAD Pax Riv	2,891	2,487	12/98	2,413	10/99	4,767	17,923	
Software Development	GSA/FP	DCS Inc., Pax Riv	1,204	2,240	1/99	2,455	12/99	CONT	CONT	17,873
Program Management Support	C/CPFF	Veda, Pax Riv	168	86	2/99	89	12/99	CONT	CONT	847
Software Development	GSA/FP	Rational, Pax Riv, MD	49	0	12/98	0	12/99			49
Software Development	C/CPFF	ISI, Pax Riv, MD	66						66	66
Software Development	GSA/FP	ISI, Pax Riv, MD	66	193	1/99	201	12/99	CONT	CONT	1,592
Software Development	C/CPFF	PRB, Pax Riv, MD	434						434	434
Software Development	GSA/FP	PRB, Pax Riv, MD		650	1/99	676	12/99	CONT	CONT	5,134
Program Management Support	C/CPFF	WBB, Pax Riv, MD	117							117
Systems Engineering	GSA/FP	WBB, Pax Riv, MD	164	33	9/99	197	12/99	CONT	CONT	1,504
Subtotal Project Development			**5,159**	**5,689**		**6,031**		**CONT**	**CONT**	**27,616**

Remarks:

Subtotal Support			**0**	**0**		**0**		**0**	**0**	

EXHIBIT R-3, FY 2000 RDT&E,N COST ANALYSIS

DATE: February 1999

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604215N

PROJECT NUMBER: W2311

PROJECT TITLE: Stores Planning

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	C/FP	Mantech, Pax Riv, MD	652	439	1/99	443	12/99	CONT	CONT	4,751
	C/CPFF	Veda, Pax Riv, MD	0	280	2/99	291	12/99	CONT	CONT	3,095
Subtotal Test & Evaluation			**652**	**719**		**734**		**CONT**	**CONT**	**7,846**
Remarks:										
Misc.	WX	Various	523	742		667		CONT	CONT	
Subtotal Management			**523**	**742**		**667**		**0**	**0**	
SBIR Assessment				121						
Remarks:										
Total Cost			**6,334**	**7,271**		**7,432**		**CONT**	**CONT**	

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604215N
PROGRAM ELEMENT TITLE: Standards Development

PROJECT NUMBER: E2312
PROJECT TITLE: Common Helicopters

(U) COST: (Dollars in Thousands)

Project Number & Title	FY 1998 Budget	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete	Total Program
E2312 Common Helicopters *	0	452	1,442	1,975	2,766	1,213	1,253	1,290	CONT.	CONT.
TOTAL	0	452	1,442	1,975	2,766	1,213	1,253	1,290	CONT.	CONT.

Quantity of RDT&E Articles

* Previously funded under W2312

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Tactical Automated Mission Planning System (TAMPS) is the CNO designated common automated mission planning system for the Navy. Automated mission planning systems to date have been developed targeting the planning requirements for fixed-wing aircraft, while the unique planning requirements for helicopters have not been addressed. The unique and enhanced automated mission planning requirements that must be developed and implemented for helicopters include: data loading, an enhanced route editor (serpentine routing, hover, etc.) manipulation of higher fidelity (smaller scale) maps and imagery, enhanced performance tools (performance in and out of ground effect, performance degradation due to atmospheric conditions & elevation), and enhanced fidelity of threat analyses. The following type/model/series aircraft are supported by this PE: AH-1W, UH-1N, H-46D/E, H-53D/E, H-60B/F/H/R, and V-22. The developed common helicopter functionality will initially be implemented in Naval Portable Flight Planning Software (N-PFPS). The fully developed and Fleet released common helicopter functionality will migrate to the Joint Mission Planning System (JMPS) after JMPS initial fielding.

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5 | **PROGRAM ELEMENT: 0604215N** | **PROGRAM ELEMENT TITLE: Standards Development** | **PROJECT NUMBER: E2312** | **PROJECT TITLE: Common Helicopters**

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1998 ACCOMPLISHMENTS:
   - (U) ($0K) N/A

2. (U) FY 1999 PLAN:
   - (U) ($445) Develop, test and release software version 3.1 for common helicopter data loading. Conduct an analyses of common helicopter requirements to be implemented in subsequent N-PFPS and JMPS.

   - (U) ($7) Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15 USC 638.

3. (U) FY 2000 PLAN:
   - (U) ($1,442) Commence development of common helicopter functionality as identified in the FY-99 requirements analyses. Release version 4.0 as N-PFPS.

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604215N
PROGRAM ELEMENT TITLE: Standards Development

PROJECT NUMBER: E2312
PROJECT TITLE: Common Helicopters

(U) B. PROGRAM CHANGE SUMMARY

	FY 1998	FY 1999	FY 2000
(U) FY 1999 President's Budget:	0	453	1,468
(U) Appropriated Value:		453	
(U) Adjustments from President's Budget:		-1	-26
(U) FY 2000 President's Budget Submit:	0	452	1,442

CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1999 net decrease results from a -$1 thousand balancing adjustment.

FY 2000 net decrease of -$26 reflects a decrease for minor pricing adjustments.

(U) Schedule: Not Applicable

(U) Technical: Not Applicable

(U) C. OTHER PROGRAM FUNDING SUMMARY

Appn	FY 1998 Budget	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete
OPN	15,280	23,529	20,769	15,480	19,078	13,621	13,336	14,342	CONT.

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604215N** **PROJECT NUMBER: E2312**
PROGRAM ELEMENT TITLE: Standards Development **PROJECT TITLE: Common Helicopters**

Related RDT&E

(U) P.E. 0604231N Mission Planning (E2213)

(U) D. ACQUISITION STRATEGY - NOT APPLICABLE.

(U) E. SCHEDULE PROFILE

	FY 1998	FY 1999	FY 2000	To Complete
(U) Program Milestones		2 Q/99 3.1 Release	2 Q/00 3.2 Release	
(U) Engineering Milestones				
(U) T&E Milestones		1 Q/99 OT	1 Q/00 OT	
(U) Contract Milestones				

EXHIBIT R-3, FY 2000 RDT&E,N COST ANALYSIS

DATE: February 1999

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604215N

PROJECT NUMBER: E2312

PROJECT TITLE: Common Helicopters

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Software Development	WX	USAF, Eglin AFB, FL		404	10/98	1,413	10/99	CONT.	CONT	
Subtotal Project Development			**0**	**404**		**1,413**		**CONT**	**CONT**	
Remarks										
Government Engineering Support	WX	SPAWAR, Det/Philadelphia	0	41	10/98	29	10/99	CONT	CONT	
Subtotal Support			**0**	**41**		**29**		**CONT**	**CONT**	
Remarks										
Subtotal Test & Evaluation			**0**	**0**		**0**		**0**	**0**	
Remarks										
Subtotal Management			**0**	**0**		**0**		**0**	**0**	
SBIR Assessment				7						
Remarks										
Total Cost			**0**	**452**		**1,442**		**CONT**	**CONT**	

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 1999

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) COST: (Dollars in Thousands)

Project Number & Title	FY 1998 Budget	FY 1999 Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete	Total Program
W0572 Joint Services/Navy Standard Avionics Components and Subsystems										
	24,657	41,006	63,586*	76,991*	50,223*	25,687*	18,095*	12,147*	CONT.	CONT.
TOTAL	**24,657**	**41,006**	**63,586**	**76,991**	**50,223**	**25,687**	**18,095**	**12,147**	**CONT.**	**CONT.**
Quantity of RDT&E Articles	3	49	122	69	46	0	0	0	0	289

(U) A. 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, Terrain Awareness Warning System (TAWS) in TACAIR aircraft, Low Probability of Intercept Altimeter (LPIA), Tactical Aircraft Moving Map Capability (TAMMAC), Formation Collision Avoidance System (FCAS), Communication Navigation Surveillance Air Traffic Management (CNS/ATM), Flight Avionics Displays (FAD) in FY98 and FY99 becomes Advanced Mission Computer & Displays (AMC&D) in FY00. Participation in Human Factors Quality Management Board (HFQMB) ensures Navy safety upgrades and mandatory safety improvements for naval aircraft.

The RDT&E Articles include Tactical Aircraft Moving Map Capability (TAMMAC) Engineering & Manufacturing Development (E&MD) units, Communication Navigation Surveillance/Air Traffic Management (CNS/ATM) E&MD units, AMC&D E&MD units which include Display Processors and Mission Processors, Display Heads, 8 x 10 displays, Fiber Channel Switches, and technology roll kits.

*The increase in this Project Unit is from PE 0604574N - Navy Tactical Computer Resources, Project Unit W0845 - AN/AYK-14 and POM 00 increase for AMC&D to support hardware processing for F/A-18E/F Tactical F requirements. Project Unit W0845 is combined with PE 0604215N, Project Unit W0572 beginning FY00. With this combination, Flight Avionics Displays (FAD) becomes Advanced Mission Computer and Displays (AMC&D).

DATE: February 1999

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) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1998 ACCOMPLISHMENTS:

   - (U) ($2,821) Safety: Continued with integration, testing, and deficiency correction for the GPWS CAT II installed in the F/A-18 A/BC/D/E/F aircraft.
   - (U) ($4,648) Continued development of the LPIA program. Conducted Hardware and Software Critical Design Reviews (CDR).
   - (U) ($8,511) Conducted CDR and continued development effort of the TAMMAC program. Received first asset deliveries, continued F/A-18, AV-8B, and TAMPS integration efforts, began qualification testing, and initiated combined DT/OT on the F-18 C/D.
   - (U) ($7,330) Developed acquisition documentation, achieved Milestone II decision, awarded 845 Other Transaction Agreement (OTA), and completed Systems Requirements Review (SRR).
   - (U) ($1,347) Continued to support the JSRC tri-service coordination to promote commonality and joint programs with focus on interoperability/connectivity communications and CNS/ATM. Supported and participated in Avionics Operational Advisory Group (OAG) panels and HFQMB.

2. (U) FY 1999 PLAN:

   - (U) ($ 3,175) Complete combined DT/OT and commence TECHEVAL for the LPIA program.
   - (U) ($ 8,819) 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) ($17,360) Conduct CDR and continue development and integration of FAD for F/A-18 E/F. Completed Preliminary Design Review (PDR) for FAD. Integrate AV-8B into the AMC&D program.
   - (U) ($ 1,350) Continue to support the JSRC tri-service coordination to promote commonality and joint programs with focus on interoperability/connectivity communications and CNS/ATM. Support and participate in Avionics OAG panels and HFQMB.

- (U) ($ 1,423) Safety: Continue with deficiency correction of the GPWS CAT II in the F/A-18 C/D/E/F aircraft.
- (U) ($ 2,232) Safety: Begin systems integration and software development of the Terrain Awareness Warning System (TAWS) with the TAMMAC Digital Map on the F/A-18 to increase the GPWS operational envelope and complete TAWS PDR for F/A-18 OFP 17C/18E.
- (U) ($ 465) Safety: Begin investigation of system technical alternatives for the Formation Collision Avoidance System (FCAS).
- (U) ($ 5,351) Award development contracts and complete PDRs for Required Navigation Performance (RNP-4), a software and hardware modification to Embedded Global Positioning System/Initial Navigation System (EGI) to increase integrity of navigation solution to levels acceptable to FAA and International Civil Aviation Organization (ICAO), and Mode S (type of data link, mode (S)elect) to enable required mandatory operations with desired improvements for commercial derivative and tactical naval aircraft for CNS/ATM.
- (U) ($ 831) Portion of extramural program reserved for Small Business Innovative Research assessment in accordance with 15 USC 638.

3. (U) FY 2000 PLAN:

- (U) ($ 320) Safety: Complete deficiency corrections of the GPWS CAT II in the F/A-18 C/D (15C/16E) OFP aircraft.
- (U) ($ 926) Complete TECHEVAL for the LPIA program. Commence and complete OPEVAL. Achieve Milestone III decision
- (U) ($3,760) Complete F/A-18, AV-8B and TAMPS integration efforts and conduct OPEVAL on the TAMMAC program.
- (U) ($45,173) Award development contract, conduct hardware integration, design verification testing/qualification, and reliability development testing (RDT) of baseline AMC&D (formerly FAD) for the F/A-18E/F and AV-8B programs. Begin DT-IIA for F/A-18 and AV-8B. Begin development of 8 x 10 display and Fiber Channel Switch phase of the program.
- (U) ($1,360) Continue to support the JSRC tri-service coordination to promote commonality and joint programs with focus on interoperability/connectivity communications and CNS/ATM. Support and participate in Avionics OAG panels and HFQMB.
- (U) ($2,386) Safety: Complete analysis of alternatives, award development contract, and complete PDR for FCAS.

DATE: February 1999

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) ($3,600) Safety: Complete CDR of the TAWS for F/A-18 OFP 17C/18E and commence DT.
- (U) ($1,090) Initiate and complete TAMMAC/Joint Mission Planning Systems (JMPS) Functional Requirements Document, SRR, and PDR/CDR, and begin software coding.
- (U) ($1,513) Conduct TAMPS Mission Planning Module Integration.
- (U) ($3,458) Complete CDRs for VDL Mode 3, RNP-4 and Mode S to ensure required access for commercial derivative and tactical naval aircraft for CNS/ATM.

DATE: February 1999

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) B. PROGRAM CHANGE SUMMARY

	FY 1998	FY 1999	FY 2000
(U) FY 1999 President's Budget:	25,218	42,147	29,600
(U) Appropriated Value:	24,677	42,147	
(U) Adjustments from 1999 President's Budget:	(561)	(1,141)	33,986
(U) FY 2000 President's Budget Submit:	24,657	41,006	63,586

CHANGE SUMMARY EXPLANATION:

(U) Funding: FY98 reflects a reduction of $459 thousand for Small Business Innovative Research (SBIR) assessment and a reduction of $102 thousand for economic adjustments. FY 1999 reflects a reduction of $1,141 thousand for congressional undistributed reductions. FY 2000 net increase of $33,986 thousand reflects an increase of $9,803 thousand via a realignment from PE 0604574N, Project Unit W0845, for the Advanced Mission Computer (AMC), and an increase of $25,900 thousand for AMC&D to support hardware processing for F/A-18E/F requirements. These increases are partially offset by a decrease of $663 thousand for below benchmark expenditures and a decrease of $1,054 thousand for pricing adjustments.

(U) Schedule: Consolidated FAD and AMC (PE 0604574N, W0845) budgets and established the following baseline: FY 1998 reflects a change in FAD MS II from 2Q 98 to 3Q 98 as a result of the change from an ACAT III to an ACAT II designation. The change in FAD EMD Award from 2Q 98 to 4Q 98 is due to the MS II decision and contract strategy change from a cost plus contract to an 845 Other Transaction Agreement (OTA). The FAD PDR change from 4Q 98 to 1Q 99 is due to contract award change. The LPIA CDR was divided into H/W and S/W CDR. The H/W CDR was held as planned 1Q 98 and S/W CDR added in 2Q 98 as a result of increased software algorithm requirements and loss of key software personnel. FY99 reflects a change in FAD CDR from 1Q 99 to 2Q 99 due to the contract award change and PDR change in FY98. TAMMAC TECHEVAL moved from 3Q 99 to 4Q 99 to reflect the latest aircraft schedules. LPIA DT/OT schedule changed from 3Q 98 to 2Q 99 as a result of increased software algorithm requirements and turnover of key software personnel at the contract facility. LPIA 4Q 99 TECHEVAL start date moved from 7/99 to 8/99 as a result of the DT/OT schedule. TAWS PDR moved from 2Q to 3Q 99 as a result of aircraft OFP schedule changes. The GPWS CAT II DT changed from 2Q 98 to 3Q 99 as a result of aircraft OFP schedule changes. GPWS CAT II OT changed from 4Q 99 to 1Q 00 as a result of aircraft OFP schedule changes. FY 00 reflects a change in AMC&D DT to include F/A-18 3Q 00 and AV-8B 3Q 00 schedules separately. FY 01 reflects a change in TAWS OT from 3Q to 4Q 01 as a result of the OFP development schedule. AMC&D DT reflects a change to F/A-18 4Q 01 and AV-8B 2Q 01 to show schedules separately.

(U) Technical: Not applicable.

DATE: February 1999

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) C. OTHER PROGRAM FUNDING SUMMARY

Appn	FY 1998 Budget	FY 1999 Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete
APN BLI 057700	127,552	100,881	81,599	82,132	65,014	63,592	61,903	62,585	CONT.
Related RDT&E									
(U) P.E. 0604574N (W0845)	1,101	4,971	0	0	0	0	0	0	
(U) P.E. 0702207N (W2454)	0	6,445	1,733	576	766	0	0	0	

(U) D. ACQUISITION STRATEGY: AMC&D is utilizing a Sole source to McDonnell Douglas Corp. (MDC), a wholly owned subsidiary of the Boeing Company, for prototype design using an 845 Other Transaction Agreement (OTA) and CP for E&MD and LRIP. MDC conducted a competition to potential suppliers and selected GDIS for the AMC and Honeywell for Displays.

DATE: February 1999

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) E. SCHEDULE PROFILE

	FY 1998	FY 1999	FY 2000	TO COMPLETE
(U) Program Milestones	3Q MS II FAD (4/98)		1Q AMC&D PR (12/99) 3Q LPIA MS III (6/00)	3Q AMC&D MSIII (06/02) (AV-8B) 1Q AMC&D MSIII (12/03) (F/A-18) 1Q TAMMAC MSIII (10/00)
(U) Engineering Milestones	1Q LPIA H/W CDR (10/97) 2Q LPIA S/W CDR (2/98) 1Q TAMMAC CDR (12/97)	1Q FAD PDR (10/98) 2Q FAD CDR (2/99) 3Q TAWS F/A-18 (17C/18E) PDR (4/99) 4Q CNS/ATM PDRs (8/99)	2Q TAWS F/A-18 (17C/18E) CDR (1/00) 2Q JMPS PDR (1/00) 3Q JMPS CDR (5/00) 3Q CNS/ATM CDRs (4/00) 4Q FCAS PDR (6/00)	2Q FCAS CDR (1/01)

DATE: February 1999

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) E. SCHEDULE PROFILE Continued

	FY 1998	FY 1999	FY 2000	TO COMPLETE
(U) T&E Milestones	4Q TAMMAC DT/OT (8/98-4/99)	3Q GPWS CAT II DT (15C OFP) (4/99-7/99) 2Q LPIA DT-IIA/OT-IIA (2/99-7/99) 4Q LPIA TECHEVAL/OPEVAL (8/99-5/00) 4Q TAMMAC TECHEVAL (7/99-10/99)	1Q GPWS CAT II OT (15C OFP) (12/99-6/00) 2Q TAWS DT (17C/18E OFP) (2/00-11/00) 1Q TAMMAC OPEVAL (12/99-6/00) 3Q AMC&D DT-IIA1/OT-IIA1 (7/00-2/01) (F/A-18) 3Q AMC&D DT-11B1 (07/00-12/00) (AV-8B)	2Q CNS/ATM DT/OT (3/01-6/01) 4Q CNS/ATM TECHEVAL (7/01-10/01) 4Q TAWS OT (17C/18E) (7/01-9/01) 4Q FCAS DT (7/01-10/01) 2Q JMPS DT (03/01-05/01) 4Q JMPS Segment OT (5/01-9/01) 4Q AMC&D DT-IIA2 (9/01-12/01) (F-18) 2Q AMC&D DT11B2/OT-11B1 (01/01) (AV-8B)
(U) Contract Milestones	4Q FAD 845 OTA Award (7/98)	2Q CNS/ATM EMD Contract Awards (3/99)	2Q AMC&D EMD Contract Award (1/00) 2Q FCAS Contract Award (2/00)	

EXHIBIT R-3, FY 2000 RDT&E,N COST ANALYSIS

DATE: Feb 1999

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604215N

PROJECT NUMBER: W0572

PROJECT TITLE: Standard Avionics

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	Cost to Complete	Total Cost	Target Value of Contract
AMC&D/E&MD Prime Contract	SS/ 845 OTA	Boeing, St. Louis, MO	6,418	15,475		13,724		0	35,617	TBD
AMC&D/E&MD Prime Contract	SS/ CP EMD	Boeing, St. Louis, MO	0	0		26,876	1/00	Cont.	Cont.	TBD
LPIA/E&MD Prime Contract	C/Cost Share	GEC, Wayne, NJ	5,281	1,166		50		0	6,398	N/A
TAMMAC/E&MD Prime Contract	SS/ CPIF EMD	Boeing, St. Louis, MO	17,701	6,110		1,690		0	25,501	22,911
CNS/ATM/E&MD Prime Contract	SS/ BOA	Litton Woodland Hills, CA	0	1,000	3/99	1,000		Cont.	Cont.	TBD
CNS/ATM/E&MD Prime Contract	C/BOA	Allied Signal, Towson, MD	0	2,000	3/99	500		Cont.	Cont.	TBD
FCAS/E&MD Prime Contract	TBD	TBD	0	0		1,500	2/00	Cont.	Cont.	TBD
Award Fees	Misc	Misc	0	0		0		0	0	
Systems Engineering	WX	NAWC-AD PAX		1,000	1/99					
Systems Engineering	WX	NAWC-WD, PT MUGU	0	0		1,090	11/00	Cont.	Cont.	
Systems Engineering	WX	NAWC-WD, PT MUGU	0	0		1,513	11/00	Cont.	Cont.	
Misc	Misc	Misc	42,385	7,139		8,934		Cont.	Cont.	
Subtotal Product Development			**71,785**	**33,890**		**56,877**		**Cont.**	**Cont.**	

Remarks: *P.E. 0604574N, Project Unit W0845 is being combined with this project unit beginning FY00 and out. Target Value of Boeing 845 Contract includes funds from both W0845 and W0572. GEC Cost Share contract does not have a Target Value. This contract has been changed from a CPIF to a Cost Share with a 25/75 ratio and a total liability to the government of $6,200K . The additional $198K is budgeted for anticipated mods to be exercised for additional tasking through GEC for OT support. Boeing Sole Source EMD contract reflects a delta in Total Cost and Target Value in concert with Management EAC. EAC includes $1,692K unrecoverable cost overrun and $898K risk provision.

Misc	Misc	Misc	12,849	2,483		2,727		Cont.	Cont.	
Subtotal Support			**12,849**	**2,483**		**2,727**		**Cont.**	**Cont.**	

Remarks

Note: PE 0604574N, Project unit W0845 is combined with P.E. 0604215N, project unit W0572 beginning FY00. With this combination, Flight Avionics Displays (FAD) becomes Advanced Mission Computer and Displays (AMC&D).

EXHIBIT R-3, FY 2000/2001 RDT&E,N COST ANALYSIS DATE: Feb 1999

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604215N PROJECT NUMBER: W0572
PROJECT TITLE: Standard Avionics

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Systems T&E/OT&E	WX	NAWC-AD PAX	0	0		1,700	12/00	Cont.	Cont.	
Systems T&E/OT&E	WX	NAWC-AD PAX	0	1,041	10/99	200	10/00	Cont.	Cont.	
Misc	Misc	Misc	13,519	2,761		2,082		Cont.	Cont.	
Subtotal Test & Ev			**13,519**	**3,802**		**3,982**		**Cont.**	**Cont.**	
Remarks										
Misc	Misc	Misc	0	0		0		Cont.	Cont.	
Subtotal Management			**0**	**0**		**0**		**Cont.**	**Cont.**	
Remarks										
SBIR Assessment				831						
Total Cost			**98,166**	**41,006**		**63,586**		**Cont.**	**Cont.**	

Note: PE 0604574N, Project unit W0845 is combined with P.E. 0604215N, project unit W0572 beginning FY00. With this combination, Flight Avionics Displays (FAD) becomes Advanced Mission Computer and Displays (AMC&D).

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604216N
PROGRAM ELEMENT TITLE: Multi-Mission Helicopter Upgrade Development

(U) COST: (Dollars in Thousands)

Project Number & Title	FY 1998* Budget	FY 1999* Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete	Total* Program
H1707, MMH Upgrade Dev	94,722	230,412	118,701	31,332	8,067	6,856	0	0	0	751,298
RDT&E Test Articles		3								3
TOTAL	**94,722**	**230,432**	**118,701**	**31,332**	**8,067**	**6,856**	**0**	**0**	**0**	**751,298**
Quantity of RDT&E Articles		3								3

FY98 H1707 funding includes Congressional Adds from program element 0604212N projects H0485 ($2,228 thousand for ALFS), H2412 ($14,154 thousand for SH-60R Block II), H2413 ($4,718 thousand for Air Interoperability Center), and H2414 ($4,718 thousand for Parametric Airborne Dipping Sonar). In addition, FY98 is $1 thousand over controls due to an administrative error in controls.

FY99 H1707 funding includes Congressional Adds from program element 0604212N projects H2414 ($5,986 thousand for Parametric Airborne Dipping Sonar), H2631 ($9,997 thousand for LAMPS COTS), and H2633 ($998 thousand for Ship Ground Station Upgrade).

*From program inception through FY99, program funded under P.E. 0604212N, ASW & Other Helo Development, Project Unit H1707.

(U) A. 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) 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.

DATE: February 1999

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604216N** **PROJECT NUMBER: H1707**
PROGRAM ELEMENT TITLE: Multi-Mission Helicopter Upgrade Development PROJECT TITLE: MMH Upgrade Dev

(U) COST: (Dollars in Thousands)

Project Number & Title	FY 1998* Budget	FY 1999* Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete	Total* Program
H1707, LAMPS III Imp	94,722	230,412	118,701	31,332	8,067	6,856	0	0	0	751,298
Quantity of RDT&E Articles		3								

FY98 H1707 funding includes projects H2412 ($14,154 thousand for SH-60R Block II), H2413 ($4,718 thousand for Air Interoperability Center), H2414 ($4,718 thousand for Parametric Airborne Dipping Sonar). The FY98 program also reflects $2.2M for ALFS development reflected under project unit H0485 for execution. In addition, FY98 is $1 thousand over controls due to an administrative error in controls.
FY99 H1707 funding includes projects H2414 ($5,986 thousand for Parametric Airborne Dipping Sonar), H2631 ($9,997 thousand for LAMPS COTS), and H2633 ($998 thousand for Ship Ground Station Upgrade).
*From program inception through FY99, program funded under P.E. 0604212N, ASW & Other Helo Development, Project Unit H1707.

(U) A. 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 Anti-Submarine Warfare (ASW) and Anti-Surface Warfare (ASUW). The Airborne Low Frequency Sonar (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. This project procures three low rate initial production test articles.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. FY 1998 ACCOMPLISHMENTS:

- (U) ($47,919) Continued systems integration and test, continue radar development, complete Phase I air vehicle development, continue system software development.
- (U) ($17,710) Began efforts to incorporate commercial off the shelf avionics technology, referred to as Common Cockpit, into prototypes.
- (U) ($9,411) Refurbished ALFS systems for LRIP Test Articles, ALFS engineering support, Integrated Logistics Support, and test planning.
- (U) ($7,279) Provided Navy systems engineering support, logistics support analysis, plan for EMD Phase II, trainer specification preparation, program management and travel.

- (U) ($2,967) Funded Test Team management and DT/OT test planning and support.
- (U) ($4,718) Congressional add for the Air Interoperability Center provided for engineering, development, integration, and testing efforts in support of test requirements.
- (U) ($4,718) Congressional add provided funds to accomplish aircraft integration and flight demonstration of Parametric Airborne Dipping Sonar (PADS).

2. FY 1999 PLAN:

- (U) ($79,977) EMD Phase I AND II: Start ESM development, initiate design of operator/tactical assistance software programs and integrated self defense suite, mission processor value engineering change proposal, complete radar development, continue system software development, support DT-IIB/OT-IIA. Conduct Test Readiness Review (TRR) and CDR #2. Conduct first flights of prototype aircraft.
- (U) ($24,800) Begin Contractor non-recurring engineering efforts including remanufacture kit design, technical drawings/tooling. Begin non-recurring engineering effort for Service Life Extension Program (SLEP) kits. Commence Non-recurring effort for avionics.
- (U) ($35,909) Procurement of management, manufacturing, material, engineering labor, and spares associated with LRIP Test Articles.
- (U) ($41,382) Continue efforts to incorporate commercial off the shelf avionics technology, referred to as Common Cockpit, into prototypes.
- (U) ($12,082) Continue efforts to refurbish ALFS units, deficiency corrections, Integrated Logistics Support, Engineering and Testing.
- (U) ($6,266) 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) ($8,106) DT-IIB/OT-IIA testing for SH-60R and ALFS subsystem initial operational testing. Conduct data reduction and analysis.
- (U) ($5,838) Congressional add provided funds to accomplish aircraft integration and flight demonstration of Parametric Airborne Dipping Sonar (PADS).
- (U) ($974) Congressional add provided funds for upgrade of the Ship Ground Station program which is to develop a testing capability that will enable the ship ground station to support air interoperability and the SH-60R test requirements.
- (U) ($9,731) Congressional add provided funds to incorporate COTS technology into acoustic/radar processors for the SH-60R development of test articles.
- (U) ($5,347) Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15 USC 638 (H1707 $4,929; H2414 $148; H2631 $246; H2633 $24).

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604216N PROJECT NUMBER: H1707
PROGRAM ELEMENT TITLE: Multi-Mission Helicopter Upgrade Development PROJECT TITLE: MMH Upgrade Dev

3. FY 2000 PLAN:

- (U) ($68,901) EMD Phase I And II: Continue ESM development, continue design of operator/tactical assistance software programs and integrated self-defense suite, continue system software development, support DT-IIB/OT-IIA. Conduct flights of prototype aircraft.
- (U) ($6,000) Continue Contractor non-recurring engineering efforts including remanufacture kit design, technical drawings/tooling. Continue non-recurring effort for avionics.
- (U) ($22,872) Procurement of management, manufacturing, material, and engineering labor associated with LRIP Test Articles.
- (U) ($8,303) ALFS hardware updates, production test equipment development, Integrated Logistics Support, Engineering, and Testing.
- (U) ($2,933) 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) ($5,764) DT-IIB/OT-IIA testing for SH-60R and ALFS subsystem operational testing. Conduct data reduction and analysis, and prepare test report.
- (U) ($3,928) Complete efforts to incorporate commercial off the shelf avionics technology, referred to as Common Cockpit, into prototypes.

DATE: February 1999

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604216N** **PROJECT NUMBER: H1707**
PROGRAM ELEMENT TITLE: Multi-Mission Helicopter Upgrade Development PROJECT TITLE: MMH Upgrade Dev

(U) B. PROGRAM CHANGE SUMMARY

	FY 1998	FY 1999	FY 2000
(U) FY 1999 President's Budget:	92,794	215,517	120,356
(U) Appropriated Value:	97,119	232,517	
(U) Adjustments from Pres Budget:	1,928	14,895	-1,655
(U) FY 2000 President's Budget Submit:	94,722	230,412	118,701

CHANGE SUMMARY EXPLANATION:

(U) Funding: The net increase of $+1,928 thousand in FY98 reflects a SBIR adjustment ($-2,359 thousand) and an increase of $+4,287 thousand of below threshold reprogrammings. FY98 is $1k over controls due to administrative error in controls. The net increase of $+14,895 thousand in FY99 reflects an economic assumption adjustment ($-533 thousand), congressional cut ($-1,000 thousand), FFRDC distribution adjustment ($-32 thousand), Contract Advisory & Assistance adjustment ($-503 thousand), civilian personnel underexecution ($-37 thousand), congressional add for PADS ($+6,000 thousand), congressional add to Upgrade Ship Ground Station ($+1,000 thousand), and congressional add for SH-60 LAMPS COTS Acoustic/Radar processors ($+10,000 thousand). The net decrease of $-1,655 thousand in FY00 reflects the PBD 604 adjustment ($-1,715 thousand), and the PBD 606 adjustment ($+60 thousand).

(U) Schedule: Not Applicable

(U) Technical: Not Applicable

(U) C. OTHER PROGRAM FUNDING SUMMARY

Appn	FY 1998 Budget	FY 1999 Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete
APN 1 Line-SH-60R P1#10			216,692	266,223	395,261	464,156	555,778	552,769	1,487,112
APN-6 Line SH-60R Initial Spares			13,372	23,062	37,297	42,246			

DATE: February 1999

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604216N** **PROJECT NUMBER: H1707**
PROGRAM ELEMENT TITLE: Multi-Mission Helicopter Upgrade Development PROJECT TITLE: MMH Upgrade Dev

Related RDT&E
(U) P.E. 0604507N (Enhanced Modular Signal Processor)
(U) P.E. 0604261N (Acoustic Search Sensors)
(U) P.E. 0604212N (ASW & Other Helo Development)

(U) C. ACQUISITION STRATEGY: The contracting plan for Common Cockpit has been changed from a Federal Acquisition Regulation contract to a Section 845 Other Transaction. In FY99, we anticipate two prime contractors for the LRIP Test Articles. A sole source contract will be awarded to Sikorsky for the Air Vehicle portion, and Lockheed Martin Federal Systems for the avionics integration.

(U) D. SCHEDULE PROFILE

	FY 1998*	FY 1999*	FY 2000	To Complete
(U) Program Milestones				
(U) Engineering Milestones		TRR 1Q CDR #2 2Q-4Q		TRR 2Q/01
(U) T&E Milestones		DT-IIB/OT-IIA 3Q Start	DT-IIB/OT-IIA 1Q Complete	TECHEVAL/OPEVAL Start 2Q/01
(U) Contract Milestones			LRIP 2Q	

*From program inception through FY99, program funded under P.E. 0604212N, ASW & Other Helo Development, Project Unit H1707.

EXHIBIT R-3, FY 2000 RDT&E,N COST ANALYSIS DATE: February 1999

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604216N PROJECT NUMBER: H1707
PROJECT TITLE: MMH Upgrade Dev

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total* Prior Yrs Cost	FY 1999* Cost	FY 1999* Award Date	FY 2000 Cost	FY 2000 Award Date	Cost to Complete	Total Cost	Target Value of Contract
EMD Hardware/Software Development	SS/CPFF	Lockheed Martin Owego, NY	222,836	79,977	Nov 98	68,901	Nov 99	17,912	389,626	389,626
ALFS System Refurbishment & Eng	C/CPIF	Raytheon Fullerton, CA	13,083	10,082	Mar 99	6,145	Nov 99	1,000	30,310	30,310
COTS Avionics Technology/H-60 Common Cockpit	845 O/T	Lockheed Martin Owego, NY	17,710	41,382	Nov 98	3,928	Nov 99	0	63,020	63,020
LRIP/Test Articles/NRE	SS/FF	Lockheed Martin Owego, NY & Sikorksy Stratford, CT	0	60,709	May 99	28,872	Nov 99	11,839	101,420	101,420
COTS Acoustics/Radar Development	FF	Lockheed Martin Owego NY	0	9,731	Apr 99	0	N/A	0	9,731	9,731
PADS Development	SS/CPIF	Sontech Bedford, NH	2,574	3,200	May 99	0	N/A	0	5,774	5,774
Subtotal Project Development			**256,203**	**205,081**		**107,846**		**30,751**	**599,881**	**599,881**

Remarks
1/Total Cost includes EMD II efforts
2/Total Cost does not reflect H0485 funding

Engineering & Technical Support	WX	NAWCA Warminster, PA	13,435	0	N/A	0	N/A	0	13,435	N/A
MISC In-House	WX	Various	18,870	6,102	Oct 98	2,694	Oct 99	1,200	28,866	N/A
MISC Contracts	RX	Various	4,798	1,613	Dec 98	2,019	Dec 99	828	9,258	N/A
AIC Engineering Support	WX	NAWCAD Pax	3,148	0	N/A	0	N/A	0	3,148	N/A
AIC Engineering Support	RX	NAWCAD Pax	1,570	0	N/A	0	N/A	0	1,570	N/A
PADS Misc In-House Support	WX	NAWCAD Pax	4,425	2,338	Apr 99	0	N/A	0	6,763	N/A
PADS Misc Contract Support	Rx	NAWCAD Pax	248	300	Jun 99	0	N/A	0	548	N/A
Ship Ground Station In-House Support	WX	NAWCAD Pax	0	974	Apr 99	0	N/A	0	974	N/A
Subtotal Support			**46,494**	**11,327**		**4,713**		**2,028**	**64,562**	**0**

EXHIBIT R-3, FY 2000 RDT&E,N COST ANALYSIS | DATE: February 1999

BUDGET ACTIVITY: 5 | PROGRAM ELEMENT: 0604216N | PROJECT NUMBER: H1707 | PROJECT TITLE: MMH Upgrade Dev

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total* Prior Yrs Cost	FY 1999* Cost	FY 1999* Award Date	FY 2000 Cost	FY 2000 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Remarks										
Test and Evaluation	WX	NAWCAD Pax River, MD	4,727	8,106	Oct 98	5,764	Oct 99	12,724	31,321	N/A
Subtotal Test & Evaluation			**4,727**	**8,106**		**5,764**		**12,724**	**31,321**	**0**
Remarks										
Misc Contracts Management Support	RX	Various	850	213	Nov 98	40	Nov 99	42	1,145	N/A
Misc In-House Management Support	WX	Various	232	338	Jan 99	338	Oct 99	676	1,584	N/A
PAD Misc Contract Mgmt Support	RX	NAWCAD Pax	45	0	N/A	0	N/A	0	45	N/A
Subtotal Management			**1,127**	**551**		**378**		**718**	**2,774**	**0**
Remarks										
SBIR Assessment			**0**	**5,347**	**N/A**	**0**	**N/A**	**0**	**5,347**	**N/A**
Other FY93 & Prior Costs			**47,413**	**0**	**N/A**	**0**	**N/A**	**0**	**47,413**	**N/A**
Total Cost			**355,964**	**230,412**		**118,701**		**46,221**	**751,298**	**138,597**

Remarks
* From program inception through FY99, funded under PE 0604212N, ASW & Other Helo Development, Project H1707

EXHIBIT R-2, FY 2000 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5

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

(U) COST: (Dollars in Thousands)

Project Number & Title	FY 1998 Budget	FY 1999 Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete	Total Program
H0489 S-3 WSIP	2,081	4,266	2,095	461	458	461	473	483	CONT	CONT
W2217 Common Support Aircraft	0	0	0	0	0	5,800	48,415	144,998	CONT	CONT
TOTAL	**2,081**	**4,266**	**2,095**	**461**	**458**	**6,261**	**48,888**	**145,481**	**CONT**	**CONT**

Quantity of RDT&E Articles

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: 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) - Common Support Aircraft (CSA) is a phased modernization program to replace aging and costly E-2C, ES-3A, S-3B, and C-2A aircraft with carrier-compatible, long service life, mission platform(s). After exploring alternatives such as a new-start aircraft and derivatives of existing aircraft the CSA program will develop and produce the solution that provides the required performance, capabilities, and 21st century growth potential at an affordable life cycle cost.

(U) JUSTIFICATION OF 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.

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604217N** **PROJECT NUMBER: H0489**

PROGRAM ELEMENT TITLE: S-3 Weapon System Improvement **PROJECT TITLE: S-3 WSIP**

(U) COST: (Dollars in Thousands)

Project Number & Title	FY 1998 Budget	FY 1999 Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete	Total Program
H0489 S-3 WSIP	2,081	4,266	2,095	461	458	461	473	483	CONT	CONT
TOTAL	**2,081**	**4,266**	**2,095**	**461**	**458**	**461**	**473**	**483**	**CONT**	**CONT**

Quantity of RDT&E Articles

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: 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) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. FY 1998 ACCOMPLISHMENTS:

(U) ($1,340) Continued Ada software development for the CPMU. (LMTDS)

(U) ($ 741) Continued hardware and software development and integration (includes $411 Aviation Depot Level Repair(AVDLR)).

DATE: February 1999

BUDGET ACTIVITY: 5 | PROGRAM ELEMENT: 0604217N | PROGRAM ELEMENT TITLE: S-3 Weapon System Improvement | PROJECT NUMBER: H0489 | PROJECT TITLE: S-3 WSIP

2. FY 1999 PLAN:

(U) ($3,580) Continue Ada software development for the CPMU. (LMTDS)

(U) ($ 381) Continue hardware and software integration.

(U) ($ 305) Perform Navy combined development and operational (DT/OT) testing of CPMU.

(U) ($ 86) Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15 USC 638.

3. FY 2000 PLAN:

(U) ($1,072) Continue Ada software development for the CPMU. (LMTDS)

(U) ($1,023) Continue hardware and software development and integration. (includes $471 AVDLR)

DATE: February 1999

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604217N** **PROJECT NUMBER: H0489**
PROGRAM ELEMENT TITLE: S-3 Weapon System Improvement **PROJECT TITLE: S-3 WSIP**

(U) B. PROGRAM CHANGE SUMMARY

	FY 1998	FY 1999	FY 2000
(U) FY 1999 President's Budget:	2,097	4,376	2,130
(U) Appropriated Value:	930	4,376	0
(U) Adjustments from Pres Budget:	-16	-110	-35
(U) FY 2000 President's Budget Submit:	2,081	4,266	2,095

CHANGE SUMMARY EXPLANATION:

(U) Funding: The net decrease of (-$16 thousand) in FY 1998 reflects an SBIR reduction of -$49 thousand, a program adjustment of +$33 thousand. The net decrease of (-$110 thousand) in FY 1999 reflects a Revised Economic Assessment of -$10, a Civilian Personnel Under-execution adjustment of -$2 thousand, and a Contract Advisory and Assistance Adjustment of -$98 thousand. The net decrease of (-$35 thousand) in FY 2000 reflects a technical budget re-balance adjustment of -$4 thousand, a Civilian Pay Rates adjustment of +$4 thousand, a Navy Working Capital Fund (NWCF) adjustment of -$5 thousand, and a Non Pay Inflation Adjustment of -$30 thousand.

(U) Schedule: Not Applicable.

(U) Technical: Not Applicable.

(U) C. OTHER PROGRAM FUNDING SUMMARY

Appn	FY 1998 Budget	FY 1999 Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete
APN S-3 OSIP (04-96) Co-Processor Memory Unit	9,496	6,378	13,044	7,127	5,656	3,400	283	374	0

Related RDT&E
(U) P.E. 0603790D (NUNN Funds)-Co-Processor Memory Unit (CPMU) (previously Mass Memory Unit))

DATE: February 1999

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604217N** **PROJECT NUMBER: H0489**
PROGRAM ELEMENT TITLE: S-3 Weapon System Improvement **PROJECT TITLE: S-3 WSIP**

(U) D. ACQUISITION STRATEGY: The Operational Requirements Document (ORD) was signed on 27 March 1997. The Acquisition Plan was number 90-14 and was approved on 17 October 1994. The contract is a Cost Plus Fixed Fee (CPFF) and was awarded to Lockheed Martin, Eagan, MN in 28 July 1995.

(U) E. SCHEDULE PROFILE

	FY 1998	FY 1999	FY 2000	TO COMPLETE
(U) Program Milestones		2Q/CPMU MSIII		1Q01/CPMU ADA Fleet Introduction
(U) Engineering Milestones		3Q/CPMU ADA FQT		
(U) T&E Milestones	2Q-3Q/CPMU DT II 3Q-4Q/CPMU OT I		3Q-4Q/CPMU ADA DT/OT IIC	
(U) Contract Milestones				

EXHIBIT R-3, FY 2000 RDT&E,N COST ANALYSIS

DATE: February 1999

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604217N

PROJECT NUMBER: H0489

PROJECT TITLE: S-3 WSIP

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Software Development	CPFF/SS	LMTDS Eagan, MN	21,596	3,580	Oct 98	1,072	Oct 99	0	26,248	26,248
Subtotal Product Development			**21,596**	**3,580**		**1,072**		**0**	**26,248**	**26,248**
Technical Support (CS)	C/FFP	RBC Crystal City, VA	100							
Subtotal Support			**100**	**0**		**0**		**0**	**0**	

Remarks:

Remarks:

EXHIBIT R-3, FY 2000 RDT&E,N COST ANALYSIS

DATE: February 1999

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604217N

PROJECT NUMBER: H0489

PROJECT TITLE: S-3 WSIP

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Developmental Testing	WX	NAWCAD Pax River, MD	2,163	580	Oct 98	999	Oct 99	CONT	CONT	
Subtotal Test & Evaluation			**2,163**	**580**		**999**		**CONT**	**CONT**	
Remarks:										
Travel	WX	NAWCAD Pax River, MD	348	20	Oct 98	24	Oct 99	CONT	CONT	
Subtotal Management			**348**	**20**		**24**		**CONT**	**CONT**	
Remarks:										
FY 1999 SBIR Assessment				86						86
Total Cost			**24,207**	**4,266**		**2,095**		**CONT**	**CONT**	

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604217N** **PROJECT NUMBER: W2217**
PROGRAM ELEMENT TITLE: S-3 Weapon System Improvement **PROJECT TITLE: CSA**

(U) COST: (Dollars in Thousands)

Project Number & Title	FY 1998 Budget	FY 1999 Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete	Total Program
W2217 CSA	0	0	0	0	0	5,800	48,415	144,998	CONT	CONT
TOTAL	**0**	**0**	**0**	**0**	**0**	**5,800**	**48,415**	**144,998**	**CONT**	**CONT**

Quantity of RDT&E Articles

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: Common Support Aircraft (CSA) is a phased modernization program to replace aging and costly E-2C, ES-3A, S-3B, and C-2A aircraft with carrier-compatible, long service life, missionized platform(s). After exploring alternatives such as a new-start aircraft and derivatives of existing aircraft the CSA program will develop and produce the solution that provides the required performance, capabilities, and 21st century growth potential at an affordable life cycle cost.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. FY 1998 ACCOMPLISHMENTS:

   (U) ($0) Develop program strategies, budgets, and plans in preparation for initial milestone in FY 1999, under PE#0605152N, Project Unit N2092.

2. FY 1999 PLAN:

   Not Applicable

3. FY 2000 PLAN:

   Not Applicable

DATE: February 1999

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604217N** **PROJECT NUMBER: W2217**
PROGRAM ELEMENT TITLE: S-3 Weapon System Improvement **PROJECT TITLE: CSA**

(U) B. PROGRAM CHANGE SUMMARY

	FY 1998	FY 1999	FY 2000
(U) FY 1999 President's Budget:	0	27,093	51,962
(U) Appropriated Value:	0	0	0
(U) Adjustments from Pres Budget:	0	-27,093	-51,962
(U) FY 2000 President's Budget Submit:	0	0	0

CHANGE SUMMARY EXPLANATION:

(U) Funding: The net decrease of -$27,093 thousand in FY 1999 reflects a Congressional reduction. The net decrease of -$51,962 thousand in FY 2000 reflects a Flag Board Restructure.

(U) Schedule: Not Applicable.

(U) Technical: Not Applicable.

(U) C. OTHER PROGRAM FUNDING SUMMARY

Appn	FY 1998 Budget	FY 1999 Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete
None.									

Related RDT&E

(U) P.E. 0605152N (Naval Aviation Studio)

DATE: February 1999

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604217N** **PROJECT NUMBER: W2217**
PROGRAM ELEMENT TITLE: S-3 Weapon System Improvement **PROJECT TITLE: CSA**

(U) D. ACQUISITION STRATEGY: A CSA Acquisition Strategy document has not been prepared or approved.

(U) E. SCHEDULE PROFILE

FY 1998	FY 1999	FY 2000

Not Applicable

EXHIBIT R-2, FY 2000 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: February 1999

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

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & Title		FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete	Total Program
X2345	Fleet METOC Equipment	4,000	4,117	4,461	4,594	4,733	4,879	4,991	5,107	CONT.	CONT.
X2346	METOC Sensor Engineering	1,738	1,849	1,634	1,562	1,540	1,563	1,597	1,633	CONT.	CONT.
TOTAL		5,738	5,966	6,095	6,156	6,273	6,442	6,588	6,740	CONT.	CONT.

(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.

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: February 1999

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 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete	Total Program
X2345 Fleet METOC Equipment (This is the consolidation of projects X0532 and X1752).	4,000	4,117	4,461	4,594	4,733	4,879	4,991	5,107	CONT.	CONT.

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) and the associated 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 replacement system (MORIAH) for 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 1998 ACCOMPLISHMENTS:

- (U) ($226) Continued test, evaluation and adaptation of GOTS/COTS technology in support of data connectivity, interfaces and C2 systems.
- (U) ($265) Completed engineering development of the TAC-4 TESS/NITES workstation.
- (U) ($232) Began engineering development of electro-optical profiler.
- (U) ($221) Began engineering development of MORIAH.

- (U) ($479) Continued systems engineering of AN/SMQ-11.
- (U) ($480) Continued systems engineering of METMF (R).
- (U) ($623) Continued Lead Laboratory tasks of software integration, assisting model developers and providing technical assistance to other activities.
- (U) ($250) Completed integration of TAC-4 TESS/NITES software build.
- (U) ($500) Began integration of next generation TESS/NITES software build.
- (U) ($496) Continued convergence of TESS and NITES software.
- (U) ($150) Began integration of advanced data base and visualization tools.
- (U) ($78) 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 1999 PLAN:

- (U) ($1,184) Continue test, evaluation and adaptation of GOTS/COTS technology in support of data connectivity, interfaces and C2 systems. Begin engineering development of a data exchange interface.
- (U) ($1,250) Continue engineering development of fleet systems (electro-optical profiler, MORIAH, AN/SMQ-11, METMF Replacement).
- (U) ($719) Continue Lead Laboratory tasks of software integration, assisting model developers and providing technical assistance to other activities.

- (U) ($314) Complete integration of next generation TESS/NITES software build.
- (U) ($400) Complete convergence and begin integration of TESS and NITES software.
- (U) ($250) Continue integration of advanced data base and visualization tools.

3. (U) FY 2000 PLAN:

- (U) ($1,440) Continue test, evaluation and adaptation of GOTS/COTS technology in support of data connectivity, interfaces and C2 systems. Continue engineering development of a data exchange interface.
- (U) ($1,250) Continue engineering development of fleet systems.
- (U) ($725) Continue Lead Laboratory tasks of software integration, assisting model developers and providing technical assistance to other activities.
- (U) ($325) Complete integration of advanced data base and visualization tools.
- (U) ($721) Begin exploitation of prototype hardware and other emerging technologies.

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1998	FY 1999	FY 2000
(U) FY 1999 President's Budget:	5,738	6,162	6,124
(U) Appropriated Value:			
(U) Adjustments from FY 1999 PRESBUDG:		- 196	- 29
(U) FY 2000 President's Budget Submit:	5,738	5,966	6,095

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: February 1999

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

B. Continued:
(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1999 adjustments include Revised Economic Assumptions (-$14K), Civilian Personnel Underexecution (-$5K), and a Contract Advisory and Assistance Services adjustment (-$177K). FY 2000 adjustments include Navy Working Capitol Fund (NWCF) rate changes adjustment (+$45K), Civilian Pay Rates (+$14K), and a Non pay inflation adjustment (-$88K).

(U) Schedule: Not applicable
(V) Technical: Not applicable

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

	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY2005 Estimate	To Complete	Total Program
(U) OPN line 4226	17,150	22,709	28,553	29,576	29,141	29,358	30,576	31,844	CONT.	CONT.

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

D. (U) ACQUISITION STRATEGY: Not applicable.

Exhibit R-3 Cost Analysis (page 1)										Date: February 99		
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/BA5		PROGRAM ELEMENT: 0604218N					PROJECT NAME AND NUMBER: X2345 FLEET METOC EQUIP					
Cost Categories	Contract Method & Type	Performing Activity & Location	Total FY98 +PY Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date	FY01 Cost	FY01 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Product Development												
	WX	NRL	0	1,700	N/A	1,750	N/A	N/A	N/A	CONT	CONT	CONT
	WX	SSC SD	0	600	N/A	600	N/A	N/A	N/A	CONT	CONT	CONT
	CP	RAYTHEON	0	200	N/A	200	N/A	N/A	N/A	CONT	CONT	CONT
	N/A	MISC	0	1,182	N/A	1,451	N/A	N/A	N/A	CONT	CONT	CONT
Subtotal Product Development			0	3,682	N/A	4,001	N/A	N/A	N/A	CONT	CONT	CONT
Remarks:												
Support	CP	SSA	0	375	N/A	400	N/A	N/A	N/A	CONT	CONT	CONT
Subtotal Support			0	375	N/A	400	N/A	N/A	N/A	CONT	CONT	CONT
Remarks												

Exhibit R-3 Cost Analysis (page 2)											Date: February 99		
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/BA5			PROGRAM ELEMENT: 0604218N								PROJECT NAME AND NUMBER: X2345 FLEET METOC EQUIP		
Cost Categories	Contract Method & Type	Performing Activity & Location	Total FY98 +PY Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date	FY01 Cost	FY01 Award Date	Cost To Complete	Total Cost	Target Value of Contract	
T&E	PD	OPTEVFOR	0	60	N/A	60	N/A	N/A	N/A				
Subtotal T&E			0	60	N/A	60	N/A	N/A	N/A				
Remarks													
Subtotal Management													
Remarks													
Total Cost			0	4,117	N/A	4,461	N/A	N/A	N/A	CONT	CONT	CONT	
Remarks													

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: February 1999

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 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete	Total Program
X2346 METOC Sensor Engineering (Formerly project X1740).										
	1,738	1,849	1,634	1,562	1,540	1,563	1,597	1,633	CONT.	CONT.

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 1998 ACCOMPLISHMENTS:

- (U) ($923) Continued development/transition of wind/wave variants of AN/WSQ-6 (series) buoys for NAVOCEANO. Added Global Positioning System (GPS)/self mooring capability to wave variants.

- (U) ($815) Continued tactical air vehicle METOC Sensor development. Instituted transition of tactical dropsonde capability to NAVAIR PMA 222/299 (Program Offices for Air Expendable and SH-60 community) and coordinated joint requirements with U.S. Air Force/U.S. Marine Corp/U.S. Army.

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: February 1999

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

2. (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 SH-60R transition and acquisition sponsorship by PMA-222.
- (U) ($294) Initiate 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) ($426) Begin engineering development of METOC Air, Surface, Undersea Reconnaissance Equipment (MEASURE).

3. (U) FY 2000 PLAN:

- (U) ($739) Complete development transition of tactical dropsonde capability to NAVAIR PMA-264 for P-3/S-3 community, PMA-299 for SH-60R transition and acquisition sponsorship by PMA-222.
- (U) ($418) Continue development of microsensor based miniature weather stations/buoys based on Defense Advanced Research Projects Agency/Office of Naval Research developed Micro Electro Mechanical (MEMS).
- (U) ($477) Continue development of MEASURE.

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: February 1999

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) CHANGE SUMMARY EXPLANATION:

(U) Funding: Not applicable.

(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) ACQUISITION STRATEGY: Not Applicable.

Exhibit R-3 Cost Analysis (page 1)								Date: February 99				
APPROPRIATION/BUDGET ACTIVITY: RDT&E, N/BA5		PROGRAM ELEMENT: 0604218N						PROJECT NAME AND NUMBER: X2346 METOC SENSOR ENGINEERING				
Cost Categories	Contract Method & Type	Performing Activity & Location	Total FY98 +PY Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date	FY01 Cost	FY01 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Product Development	WX	NRL	0	550	N/A	600	N/A	N/A	N/A	CONT	CONT	
	N/A	MISC	0	1,299	N/A	1,034	N/A	N/A	N/A	CONT	CONT	
Subtotal Product Development			0	1,849	N/A	1,634	N/A	N/A	N/A	CONT	CONT	
Remarks:												
Subtotal Support												
Remarks												

Exhibit R-3 Cost Analysis (page 2)								Date: February 99				
APPROPRIATION/BUDGET ACTIVITY: RDT&E, N/BA5		PROGRAM ELEMENT: 0604218N						PROJECT NAME AND NUMBER: X2346 METOC SENSOR ENGINEERING				
Cost Categories	Contract Method & Type	Performing Activity & Location	Total FY98 +PY Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date	FY01 Cost	FY01 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Subtotal T&E												
Remarks												
Subtotal Management												
Remarks												
Total Cost			0	1,849	N/A	1,634	N/A	N/A	N/A	CONT	CONT	
Remarks												

EXHIBIT R-2, FY 2000 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5

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

(U) COST: (Dollars in Thousands)

Project Number & Title	FY 1998 Budget	FY 1999 Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete	Total Program
H1152 P-3 Sensor Integration	12,403	2,828	3,010	3,063	3,398	2,554	8,520	8,252	CONT	CONT
Quantity of RDT&E Articles										

FY 1998 H1152 includes Congressionally directed funding for Project Number H2417 ($9,436, P-3 AIP Sensors).

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This program provides upgrades to P-3C aircraft systems to enhance surface and subsurface tracking, classification, and attack capabilities including Specific Emitter Identification (SEI) and improved radar tracking. The P-3C Sensor Integration project develops software necessary to integrate advanced sensors into embedded P-3C Update III computer systems. In FY 2004, P-3 Sensor transition to Multi-Mission Maritime Aircraft (MMA) begins. Efforts will include the migration of current sensors and weapons; the selection and development of new sensors, weapons and system architectures; and improved supportability and maintainability of all aircraft systems. Also, P-3 Sensor Integration will expand software development of P-3 systems to integrate additional sensors, tactical decision aids, and color capabilities to improve aircrew tactical proficiency and awareness. This program is funded under ENGINEERING & MANUFACTURING DEVELOPMENT because it encompasses engineering and manufacturing development of new end-items prior to production approval decision.

DATE: February 1999

BUDGET ACTIVITY: 5

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

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

(U) COST: (Dollars in Thousands)

Project Number & Title	FY 1998 Budget	FY 1999 Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete	Total Program
H1152 P-3 Sensor Integration	12,403	2,828	3,010	3,063	3,398	2,554	8,520	8,252	CONT	CONT
Quantity of RDT&E Articles										

FY 1998 H1152 includes Congressionally directed funding for Project Number H2417 ($9,436, P-3 AIP Sensors).

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This program provides upgrades to P-3C aircraft systems to enhance surface and subsurface tracking, classification, and attack capabilities including Specific Emitter Identification (SEI) and improved radar tracking. The P-3C Sensor Integration project develops software necessary to integrate advanced sensors into embedded P-3C Update III computer systems. In FY 2004, P-3 Sensor transition to Multi-Mission Maritime Aircraft (MMA) begins. Efforts will include the migration of current sensors and weapons; the selection and development of new sensors, weapons and system architectures; and improved supportability and maintainability of all aircraft systems. Also, P-3 Sensor Integration will expand software development of P-3 systems to integrate additional sensors, tactical decision aids, and color capabilities to improve aircrew tactical proficiency and awareness. This program is funded under ENGINEERING & MANUFACTURING DEVELOPMENT because it encompasses engineering and manufacturing development of new end-items prior to production approval decision.

DATE: February 1999

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604221N** **PROJECT NUMBER: H1152**
PROGRAM ELEMENT TITLE: P-3 Modernization Program **PROJECT TITLE: P-3 Sensor Integration**

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. FY 1998 ACCOMPLISHMENTS:

(U) ($ 500) Continued system engineering support for proper integration of new sensors.

(U) ($1,838) Completed developmental and operational testing of Tactical Mission Software (TMS)/Airborne Operational Program (AOP) supporting Improved Extended Echo Ranging (IEER) integration and conduct Systems Requirements Review (SRR).

(U) ($ 629) Aviation Depot Level Repairable (AVDLR).

(U) ($2,432) Designed APS-137 upgrade for Precision Targeting and Enhanced Synthetic Aperture Radar (SAR) mode.

(U) ($7,004) Designed workload sharing between tactical crew station and data fusion of off-board and on-board sensor data, as well as improve sensor capabilities.

DATE: February 1999

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604221N** **PROJECT NUMBER: H1152**
PROGRAM ELEMENT TITLE: P-3 Modernization Program **PROJECT TITLE: P-3 Sensor Integration**

2. FY 1999 PLAN:

(U) ($ 500) Continue system engineering support for proper integration of new sensors.

(U) ($ 1,571) Continue IEER integration and conduct Preliminary Design Review (PDR) and Critical Design Review (CDR).

(U) ($ 720) Aviation Depot Level Repairable (AVDLR).

(U) ($ 37) Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15 USC 638.

3. FY 2000 PLAN:

(U) ($ 457) Continue system engineering support for proper integration of new sensors.

(U) ($1,816) Continue IEER integration and testing.

(U) ($ 737) Aviation Depot Level Repairable (AVDLR).

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604221N** **PROGRAM ELEMENT TITLE: P-3 Modernization Program** **PROJECT NUMBER: H1152** **PROJECT TITLE: P-3 Sensor Integration**

(U) B. PROGRAM CHANGE SUMMARY

	FY 1998	FY 1999	FY 2000
(U) FY 1999 President's Budget:	13,025	3,046	3,118
(U) Appropriated Value:	13,191	3,046	0
(U) Adjustments from Pres Budget:	-622	-218	-108
(U) FY 2000 President's Budget Submit:	12,403	2,828	3,010

FY 1998 includes $9,436 thousand for Project Number H2417 (P-3 AIP Sensors).

CHANGE SUMMARY EXPLANATION:

(U) Funding: The net decrease of (-$622 thousand) in FY 1998 includes a net decrease of -$58 thousand for H1152 and a net decrease of -$564 thousand for H2417. The net decrease of -$58 thousand for H1152 includes an SBIR adjustment of -$14 thousand and programmatic adjustments of -$44 thousand. The net decrease of -$564 thousand in H2417 reflects an SBIR adjustment of -$267 thousand, and an Economic Assumption reduction of -$22 thousand, a National Defense Missile reduction of -$125 thousand, and a Navy flight Hours reduction of -$150 thousand. The net decrease of -$218 thousand in FY 1999 includes a Revised Economic Assessment of -$7 thousand, a Civilian Personnel Under-execution adjustment of -$4 thousand, and a Contract Advisory and Assistance Services adjustment of -$207 thousand. The net decrease of (-$108 thousand) in FY 2000 includes a technical budget re-balance adjustment of -$5 thousand, a Full Institutional Funding adjustment of -$56 thousand, a Civilian Pay Rates adjustment of +$10 thousand, a Non Pay Inflation adjustment of -$44 thousand, and a Navy Working Capital Fund (NWCF) adjustment of –$13 thousand.

(U) Schedule: FY 2000 adds a new Program milestone for Radar Initial Operating Capability (IOC) in the 1st quarter, and a new Engineering milestone in the 3rd quarter for IEER Integration and Testing (I&T).

(U) Technical:

(U) C. OTHER PROGRAM FUNDING SUMMARY

Appn	FY 1998 Budget	FY 1999 Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete
None.									

DATE: February 1999

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604221N** **PROJECT NUMBER: H1152**
PROGRAM ELEMENT TITLE: P-3 Modernization Program **PROJECT TITLE: P-3 Sensor Integration**

Related RDT&E
(U) P.E. 0606261N (Acoustic Search Sensors developing software and acoustic algorithms).

(U) D. ACQUISITION STRATEGY: The Operational Requirements Document (Ser# 297(1)-05-97)) for H1152 was approved on 29 December 1997. The ORD (Ser# 355-88-94) for H2417 was approved on 30 March 1994. The Acquisition Plan (AIR-93-08A Rev 2) was approved on 30 March 1998.

(U) E. SCHEDULE PROFILE

	FY 1998	FY 1999	FY 2000	TO COMPLETE
(U) Program Milestones		4Q/SEI IOC 2Q/ Software IOC 1Q/SEI CDR	1Q/Radar IOC	4Q01/IOC
(U) Engineering Milestones	3Q/IEER SRR 3Q/SEI IR 4Q/SEI PDR 3Q/Software IR 4Q/Software	1Q/IEER PDR 3Q/IEER CDR 1Q/SEI CDR 1Q/Radar PDR CDR 2Q/Radar CDR	3Q/IEER I&T	
(U) T&E Milestones		1Q/Software DT/OT 3Q/SEI DT/OT 4Q/Radar DT/OT		1Q-2Q01 IEER DTIII 3Q-4Q01 IEER OTIII
(U) Contract Milestones	2Q/Radar Mod 3Q/SEI Mod 3Q/Software Mod			

EXHIBIT R-3, FY 2000 RDT&E,N COST ANALYSIS

DATE: February 1999

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604221N

PROJECT NUMBER: H1152

PROJECT TITLE: P-3 Sensor Integration

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Subtotal Product Development			**0**	**0**		**0**		**0**	**0**	
Remarks:										
Technical Support (CS)	C/FFP	RBC Arlington, VA	2,665	500	Nov 98	457	Nov 99	CONT	CONT	CONT
Systems Engineering Support	Various	Various	23,815	901	Nov 98	1,074	Nov 99	CONT	CONT	CONT
Systems Engineering Support	SS	LMTDS/ Eagan, MN	14,561	0						
Systems Engineering Support	C/FFP	RTIS/McK.,TX	2,432	0						
Systems Engineering Support	WX	NAWC/AD Pax River, MD		610	Nov-98	682	Nov-99	CONT	CONT	CONT
Subtotal Support			**43,473**	**2,011**		**2,213**		**CONT**	**CONT**	**CONT**
Remarks:										

EXHIBIT R-3, FY 2000 RDT&E,N COST ANALYSIS

DATE: February 1999

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604221N

PROJECT NUMBER: H1152

PROJECT TITLE: P-3 Sensor Integration

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Test and Evaluation	WX	NAWC/AD Pax River	3,915	780	Nov 98	797	Nov 99	CONT	CONT	CONT
Subtotal Test & Evaluation			**3,915**	**780**		**797**		**CONT**	**CONT**	**CONT**
Remarks:										
Subtotal Management			**0**	**0**		**0**		**0**	**0**	**0**
Remarks:										
FY 1999 SBIR Assessment				37					37	
Total Cost			**47,388**	**2,828**		**3,010**		**CONT**	**CONT**	**CONT**

FY 2000 President's Budget Estimates

EXHIBIT R-2, RDT&E,N Budget Item Justification DATE: February 1999

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604231N
PROGRAM ELEMENT TITLE: Tactical Command System

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1998 ACTUAL	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	COST TO COMPLETE	TOTAL PROGRAM
E2213 Mission Planning	5,855	13,222	11,169	14,173	10,932	11,495	12,113	12,366	CONT.	CONT.
R2295 JDISS	2,442	0	0	0	0	0	0	0	0	2,442
X0486 GCCS-M Tactical/Mobile (formerly JMCIS Tactical/Mobile)	2,717	2,107	1,396	1,549	1,632	1,806	1,895	1,811	CONT.	CONT.
X0709 GCCS-M Maritime Apps (formerly JMCIS Afloat)	6,117	10,725	6,715	8,848	8,885	10,767	12,961	12,821	CONT.	CONT.
X2009 JMCIS OED	1,932	1,934	2,134	2,207	2,106	1,987	2,204	2,355	CONT.	CONT.
X2041 JMCIS Ashore (funding transferred to GCCS-M Maritime Apps and GCCS-M Common Apps beginning FY00)	5,966	0	0	0	0	0	0	0	0	5,966
X0521 GCCS-I Intelligence Apps (formerly Shipboard Tactical Intelligence Processing (STIP))	5,307	6,717	6,737	7,037	6,877	7,665	7,492	7,923	CONT.	CONT.
X2215 Joint Interoperability	0	0	0	0	0	0	0	0	0	0
X2216 C4I for Joint Littoral Warfare (JLW)	0	0	0	0	0	0	0	0	0	0
X2305 GCCS-M Common Apps (formerly Navy Common Operating Environment (COE))	1,681	12,987	13,448	15,090	17,381	18,791	18,923	19,063	CONT.	CONT.
X2306 Naval Simulation System	2,342	1,741	0	0	0	0	0	0	0	4,083
X2307 Shipboard LAN/WAN	478	434	0	467	416	459	539	551	CONT.	CONT.
X2418 JSTARS Integration	4,663	0	0	0	0	0	0	0	0	4,663
TOTALS	39,500	49,867	41,599	49,371	48,229	52,970	56,127	56,890	CONT.	CONT.

R-1 Shopping List-Item No. 89-1 of 89-69

FY 2000 President's Budget Estimates

EXHIBIT R-2, RDT&E,N Budget Item Justification DATE: February 1999

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604231N
PROGRAM ELEMENT TITLE: Tactical Command System

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Tactical Command System (TCS) upgrades the Navy's Command Control, Computer and Intelligence (C^3I) systems and processes C^3I 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 Global Command and Control System - Maritime (GCCS-M). GCCS-M 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). GCCS-M has aggressively pursued an evolutionary acquisition strategy in rapidly developing and fielding new C4I capabilities for GCCS-M Afloat, GCCS-M Ashore, GCCS-M Tactical /Mobile and GCCS-M OED users. GCCS-M 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-M 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.

(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.

B. (U) PROGRAM CHANGE SUMMARY: See individual projects.

C. OTHER PROGRAM FUNDING SUMMARY: See individual projects.

D. ACQUISTION STRATEGY: See individual projects.

E. SCHEDULE PROFILE: See paragraph D.

FY 2000 President's Budget Estimates

EXHIBIT R-2a, RDT&E,N Project Justification

DATE: February 1999

BUDGET ACTIVITY: 5

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

PROJECT NUMBER: E2213
PROJECT TITLE: Mission Planning

(U) COST: (Dollars in Thousands)

Project Number & Title	FY 1998 Budget	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete	Total Program
E2213 Mission Planning	5,855	13,222	11,169	14,173	10,932	11,495	12,113	12,366	CONT.	CONT.
TOTAL	5,855	13,222	11,169	14,173	10,932	11,495	12,113	12,366	CONT.	CONT.

Quantity of RDT&E Articles

(U) A. 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 Direct 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 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, Tactical Electronic Reconnaissance Processing Evaluation System (TERPES) are planned to neck down into TAMPS. TAMPS is interoperable with and uses the Global Command and Control System -- Maritime (GCCS-M) for data feeds.

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604231N

PROGRAM ELEMENT TITLE: Tactical Command System

PROJECT NUMBER: E2213

PROJECT TITLE: Mission Planning

U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1998 ACCOMPLISHMENTS:

- (U) ($5,855) TAMPS version 6.2 continues development and integration to include the following modules and functionalities: TAMMAC, H-1 mission planning module, Joint Service Imagery Processing System (JSIPS) interface and Tactical Operational Scene (TOPSCENE). Release 6.2 includes improvements to the following modules and functionalities: E-2C and SLAM modules; full duplex security; Local Area Network (LAN); Commercial Off-the-Shelf Software (COTS) and operating system upgrades; port to a new hardware suite; intelligence data base in standard extract format and update. TAMPS version 6.2 goes through T&E (OPEVAL). Development and integration of the Tactical Strike Coordination Manager (TSCM) with TAMPS version 6.2 began. TSCM version 4.0 released. With the development and initial deployment of version 3.0 of the Navy Flight Planning System (N-PFPS), a joint USAF program, the USN mission planning system started to transition from a UNIX based system to a PC based environment. For JMPS, System Engineering requirement studies were conducted for various platform specific aircraft mission planning systems (e.g. CHAMPS, MOMS, H-60, and Anti-Submarine Warfare (ASW) to continue with the execution of the migration plan. The initial phase of JMPS development begins with RFP release and contract award.

2. (U) FY 1999 PLAN:

- (U) ($13,222) TAMPS version 6.2 deploys. Year 2000 compliant software is fielded. Start development of TAMPS version 6.2.1. Add new functionality to TSCM and release version 5.0 to the Fleet after OPEVAL. Development and deployment of N-PFPS continues with the release of version 3.1. The JMPS development begins with Milestone II approval and follow on contract award. The conduct of JMPS System Engineering requirements definition conclude. JMPS begins development on Defense Information Infrastructuring-Common Operating Environment (DII-COE) complaint architecture.

3, (U) FY 2000 PLAN:

- (U) ($11,169) Complete development, integration and deployments of TAMPS version 6.2.1. Continue JMPS development effort.

FY 2000 President's Budget Estimates

EXHIBIT R-2a, RDT&E,N Project Justification

DATE: February 1999

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604231N

PROGRAM ELEMENT TITLE: Tactical Command System

PROJECT NUMBER: E2213

PROJECT TITLE: Mission Planning

(U) PROGRAM CHANGE SUMMARY:

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1998: reflects a decrease of $-249K for SBIR reduction, $+1K increase for BTR issue.

(U) B. PROGRAM CHANGE SUMMARY

	FY 1998	FY 1999	FY 2000
(U) FY 1999 President's Budget:	9,478	13,637	11,330
(U) Appropriated Value:			2,412
(U) Adjustments from President's Budget:	-3,623	-415	-161
(U) FY 2000/2001 President's Budget Submit:	5,855	13,222	11,169

CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1998 net decrease of -$3,623 thousand reflects a decrease of: -$249 thousand for FY98 SBIR Reduction, decrease of -$3,503 thousand for pending reprogramming, an increase of +$1 thousand for BTR Issue, and an increase of +$128 thousand for FY 1998 Update.

FY 1999 net decrease of $-415 thousand reflects a decrease of -$31 thousand for Revised Economic Ass., and decrease of -$384 thousand for Contract Advisory.

FY 2000 decrease of -$161 thousand for PBD 604: Non Pay Inflation.

(U) Schedule: The 6.2 release planned for FY1998 moves to FY 1999 due to increased scope.

(U) Technical: NOT APPLICABLE

EXHIBIT R-2a, RDT&E,N Project Justification

DATE: February 1999

BUDGET ACTIVITY: 5

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

PROJECT NUMBER: E2213
PROJECT TITLE: Mission Planning

(U) C. OTHER PROGRAM FUNDING SUMMARY

Appn	FY 1998 Budget	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	to Complete
OPN	15,280	23,529	20,769	15,480	19,078	13,621	13,336	14,342	CONT.
O&MN	2,063	4,288	5,868	7,273	6,939	7,022	7,088	7,301	CONT.
Air Force (total)		5,420	10,800	12,900	13,600	18,000			

Related RDT&E
(U) P.E. 0204229N (TOMAHAWK)
(U) P.E. 0604215N (Standards Development)

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604231N PROJECT NUMBER: E2213
PROGRAM ELEMENT TITLE: Tactical Command System PROJECT TITLE: Mission Planning

(U) C. ACQUISITION STRATEGY: The JMPS Acquisition strategy will evolve as the program matures but initially will cover the Engineering and Manufacturing Development (EMD) effort. The strategy entails a two phased evolutionary approach to acquire the initial JMPS development effort. The combined USAF/USN Phase I of this effort will obtain various technical studies, segment architect concept, design to cost estimate, and an architecture development statement of work. Phase I was added to the program to determine reduced cost strategies through software reuse from both USN TAMPS and USAF AFMSS programs. Additionally, this phase is to provide a risk reduction plan for the most effective migration of existing mission planning systems. The results of Phase I will influence future participation by USAF. Phase I was awarded to two contractors. Following Phase I, one of the two contractors selected to participate in Phase I will be selected to develop the JMPS framework, and selected mission planning components, as well as to be the JMPS system integrator under Phase II.

(U) D. SCHEDULE PROFILE

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Program Milestones				
Version 6.2		1st Qtr Release		
Version 6.2K		1st Qtr Release		
Version 6.2.1			3rd Qtr Release	
JMPS		JMPS Milestone II		
PFPS	2nd Qtr 3.0 Release	2nd Qtr 3.1 Release		2nd Qtr 4.1 Release
(U) Engineering Milestones				
(U) T&E Milestones		1st Qtr 6.2K DT 4th Qtr 6.2 OPEVAL	1st Qtr 6.2.1 OPEVAL	
(U) Contract Milestones	4th Qtr JMPS Phase I Contract Award	3rd Qtr JMPS Phase II Contract Award		

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EXHIBIT R-3, RDT&E,N Project Cost Analysis

DATE: February 1999

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604231N

PROGRAM ELEMENT TITLE: Tactical Command System

PROJECT NUMBER: E2213

PROJECT TITLE: Mission Planning

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Software Development	C/CPIF	TBD		4,600	10/98	6,550	10/99			Cont.	Cont.	
Software Development	WX	NAWC Pt. Mugu		4,036	10/98	3,704	10/99			Cont.	Cont.	
Software Development	WX	NSWC Dahlgren		2,025	10/98					Cont.	Cont.	
Misc.	WX	Various		1,550		836	10/99			Cont.	Cont.	
Government Engineering Support	WX	NAVAIR		100								
Subtotal Project Development				**12,311**		**11,090,**				**Cont.**	**Cont.**	
Remarks												
Government Engineering Support	WX	NAVAIR		100		0				Cont.	Cont.	
Subtotal Support			**0**	**100**		**0**				**Cont.**	**Cont.**	
Remarks												

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EXHIBIT R-3, RDT&E,N Project Cost Analysis

DATE: February 1999

BUDGET ACTIVITY: 5

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

PROJECT NUMBER: E2213
PROJECT TITLE: Mission Planning

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Subtotal Test & Evaluation			**0**	**0**		**0**				**0**	**0**	
Remarks												
Misc.	WX	Various		332	10/98	79	10/99			Cont.	Cont.	
Travel	WX	NAVAIR		230								
Program Management Support	WX	Various		199								
Subtotal Management			**0**	**761**		**79**				**Cont.**	**Cont.**	
Remarks												
Total Cost			**0**	**13,222**		**11,169**				**Cont.**	**Cont.**	

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604231N PROJECT NUMBER: X0486
PROGRAM ELEMENT TITLE: Tactical Command System PROJECT TITLE: GCCS-M TAC/MOBILE

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1998 ACTUAL	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	COST TO COMPLETE	TOTAL PROGRAM
GCCS-M Tactical/Mobile (GCCS-M Tac/Mobile) (formerly JMCIS Tactical/Mobile)										
X0486	2,717	2,107	1,396	1,549	1,632	1,806	1,895	1,811	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The GCCS-M Tactical/Mobile (GCCS-M Tac/Mobile) 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 C^4I systems (based on the Joint Maritime Command Information System (JMCIS) common architecture) which is evolving to the GCCS-Maritime 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 C^4I 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 GCCS-Maritime platforms, Joint, NATO and allied forces. JTM systems leverage other JMCIS 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). GCCS-M Tac/Mobile funding for C2 efforts will transfer to the GCCS-M Maritime Applications Program beginning with FY 00. This transfer of C2 efforts was partially implemented in FY 00.

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604231N

PROGRAM ELEMENT TITLE: Tactical Command System

PROJECT NUMBER: X0486

PROJECT TITLE: GCCS-M TAC/MOBILE

The TSC/MOCC R&D efforts are developed in agreement with and in mutual support of both N62 and N88. These efforts are required to provide support for the N88 platforms.

EXHIBIT R-2a, RDT&E,N Project Justification DATE: February 1999

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604231N PROJECT NUMBER: x0486
PROGRAM ELEMENT TITLE: Tactical Command System PROJECT TITLE: GCCS-M Tac/Mobile

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1998 ACCOMPLISHMENTS:

- (U) ($1,312) Complete JMCIS 3.1 system integration with an objective of an Operational Test 2nd Qtr 1998 and a Milestone IIIC review 2nd Qtr 1998. JMCIS 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 (Q2) leading to a Milestone IIIC decision (Q3) for fleet release and installation of GCCS-Maritime 3.1.

- (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, Surveillance 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 PLAN:

- (U) ($776) Continue development in 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).

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604231N PROJECT NUMBER: x0486
PROGRAM ELEMENT TITLE: Tactical Command System PROJECT TITLE: GCCS-M Tac/Mobile

- (U) ($806) Support P-3C AIP and pre-planned product improvements in open system architecture and sensor integration. Provide improved Tactical Data Insertion for increased sensor effectiveness and automated post-flight analysis for rapid information dissemination via the SIPRNET.
- (U) ($260) Develop multi-TADIL interfaces to provide two-way TADIL support for TSC and MOCC.
- (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.

3. (U) FY 2000 PLAN:

- (U) ($222) Port additional functions to NT. Develop interface for emerging aircraft data transport devices, such as RDSS. Move drivers, redesign HMI for windows, re-host applications on NT.
- (U) ($290) Develop capability to process information from new sensors such as SAR and high resolution ISAR. Investigate processing I&Q data from APS 137 B(V)5 radar.
- (U) ($150) Develop expanded interface for new weapons and sensors such as SLAM, Pioneer and LIDAR.
- (U) ($240) Develop capability to process information from new sensors, IEER/AEER.
- (U) ($294) Develop lightweight FTAS. Cut weight/volume by minimum of fifty percent. Investigate COTS signal processing products to replace proprietary hardware and software. Will allow FTAS to take advantage of software developed for Common Acoustic Processor.
- (U) ($200) Develop interfaces and incorporate emerging joint and coalition SATCOM and line of sight radios, cryptographic units and antenna technology. Ensure interoperability in a land, sea, air, and mobile environment.

(U) PROGRAM CHANGE SUMMARY: FY 1998: SBIR reduction of ($-65K), DD1002: April 1998 update ($-134K), FY1998 June BTR update ($-2K), FY 98 update ($-6). Net change was ($-207K).

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EXHIBIT R-2a, RDT&E,N Project Justification DATE: February 1999

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604231N PROJECT NUMBER: x0486
PROGRAM ELEMENT TITLE: Tactical Command System PROJECT TITLE: GCCS-M Tac/Mobile

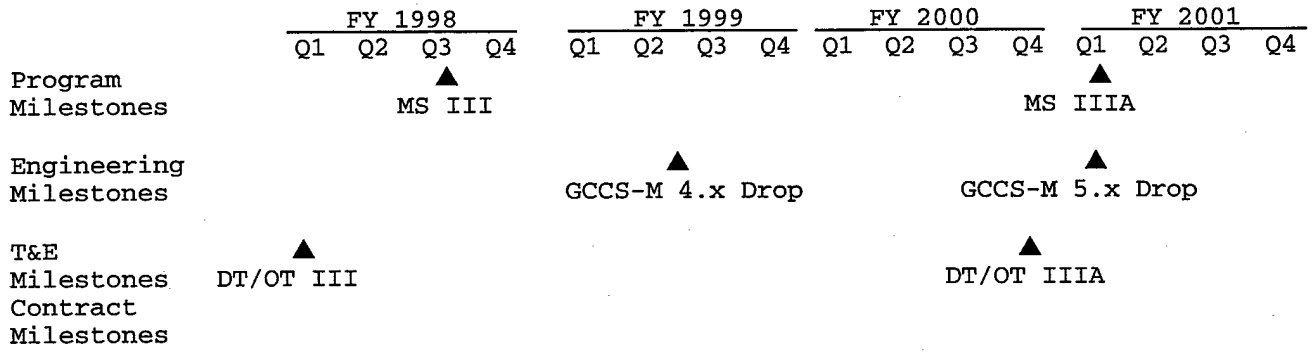
B. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands)

	FY 1998 ACTUAL	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	COST TO COMPLETE	TOTAL PROGRAM
(U) OMN	10,241	8,335	8,963	9,409	10,685	11,204	11,403	11,690	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.

C. (U) ACQUISITION STRATEGY:



D. SCHEDULE PROFILE: See paragraph C.

FY 2000 President's Budget Estimates

EXHIBIT R-3, RDT&E,N Project Cost Analysis

DATE: February 1999

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604231N

PROGRAM ELEMENT TITLE: Tactical Command System

PROJECT NUMBER: X0486

PROJECT TITLE: GCCS-M Tac/Mobile

Cost Categories	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date	FY01 Cost	FY01 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Software Development	Various	Various	28,868	1,314	Var.	702	Var.			CONT.	CONT.	
Subtotal Product Development	Various	Various	28,868	1,314	Var.	702	Var.			CONT.	CONT.	
Remarks:												
System Engineering	Various	Various	18,068	423	Var.	430	Var.			CONT.	CONT.	
Subtotal Support	Various	Various	18,068	423	Var.	430	Var.			CONT.	CONT.	
Remarks												

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EXHIBIT R-3, RDT&E,N Project Cost Analysis

DATE: February 1999

BUDGET ACTIVITY: 5

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

PROJECT NUMBER: X0486
PROJECT TITLE: GCCS-M Tac/Mobile

Cost Categories	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date	FY01 Cost	FY01 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Operational Test & Evaluation	Various	Various	2,891	75	Var.	65	Var.			CONT.	CONT.	
Subtotal T&E	Various	Various	2,891	75	Var.	65	Var.			CONT.	CONT.	
Remarks												
Project Management	Various	Various	9,204	295	Var.	199	Var.			CONT.	CONT.	
Subtotal Management	Various	Various	9,204	295	Var.	199	Var.			CONT.	CONT.	
Remarks												
Total Cost	Various	Various	59,031	2,107	Var.	1,396	Var.			CONT.	CONT.	
Remarks												

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EXHIBIT R-2a, RDT&E,N Project Justification DATE: February 1999

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604231N PROJECT NUMBER: X0709
PROGRAM ELEMENT TITLE: Tactical Command System PROJECT TITLE: GCCS-M Maritime Apps

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1998 ACTUAL	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	COST TO COMPLETE	TOTAL PROGRAM
X0709 GCCS-M Maritime Apps (formerly JMCIS Afloat)	6,117	10,725	6,715	8,848	8,885	10,767	12,961	12,821	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: Global Command and Control System - Maritime (GCCS-M) is the maritime component of the Global Command and Control System (GCCS) architecture. GCCS-M Maritime Apps meets the mission applications requirements of the tactical commander for a near real-time, fused common tactical picture with integrated intelligence services and databases. GCCS-M supports the Command, Control, Communication, Computers and Intelligence (C4I) mission requirements of the Fleet Commanders, Type Commanders, Navy Command Center, 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 requirements. Efforts include design, integration, and test of Tactical Decision Aids (TDAs) and integration of GCCS-M Afloat, Ashore, and Tac/Mobile baselines with weapons systems and Combat Direction Systems to provide the Battle Group/Force Commanders with the information needed to enhance their warfighting capabilities. GCCS-M is also initiating a transition to Commercial Off The Shelf (COTS) hardware and software as part of the current GCCS-M initiative to capitalize on the latest Web/PC industry/commercial technology.

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604231N PROJECT NUMBER: X0709
PROGRAM ELEMENT TITLE: Tactical Command System PROJECT TITLE: GCCS-M Maritime Apps

1. (U) FY 1998 ACCOMPLISHMENTS:

- (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) ($1,243) 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 GCCS-M Afloat connection to the JWICS, SIPRNET and other information networks.
- (U) ($640) 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 GCCS-M 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 GCCS-M Afloat.
- (U) ($336) Procure development hardware and COTS software to support hardware evaluation and software development.
- (U) ($508) Develop approaches to integrate GCCS-M Afloat LANs, WANs and transition JMCIS Afloat legacy application segments to GCCS-M 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.

2. (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) ($2,461) 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 GCCS-M 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 GCCS-M 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 GCCS-M Afloat. Investigate and evaluate COTS multi-level secure (MLS) software packages for possible inclusion in the GCCS-M 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 GCCS-M Afloat.

- (U) ($629) Procure development hardware and COTS software to support hardware evaluation and software development.
- (U) ($733) Continue to develop approaches to integrate GCCS-M Afloat LANs, WANs and transition JMCIS Afloat, JMCIS Ashore, and JMCIS Tac/Mobile legacy application segments to GCCS-M Afloat.
- (U) ($500) Initiate development and implementation of collaborative planning capability in GCCS-M Afloat.
- (U) ($503) Implement technology upgrade to TAC-X computer including, porting and integration of application/segment software.
- (U) ($623) Initiate system development integration, testing, documentation and training for GCCS-M 4.X software. Continue DII compliance implementation. Continue development to replace client workstations with NT's.
- (U) ($666) 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) ($225) Complete development, testing and fielding of Shore Targeting functionality (near real-time weapons targeting data to submarines) to GCCS-M Ashore.
- (U) ($180) Continue to integrate and make interoperable GCCS-M Ashore ASW capability with Joint ASW functionality.

3. (U) FY 2000 PLAN:

- (U) ($500) Develop new functionality and enhance existing functionality to meet the high priority requirements specified at the CRWG '99. Includes building the ability to merge and display all source TIBS and TRAP data with TADIL tracks, desktop classified video teleconferencing, and distant learning tools.
- (U) ($718) Develop employment scheduling and decision support tools to maximize use of native NT environment. Extend functionality of scheduling tools to support creation of scenario-based calculations for fuel burn rates,

review of maritime aviation readiness, and calculation of combined/joint exercise training readiness. Develop an integrated data display and dissemination tool to provide multiple echelons (ISICs, TYCOMs, and CINCs) a singular view of force scheduling data.

- (U) ($550) Provide interface to process raw readiness data input from lower echelons and incorporate into validated readiness data repositories at fleet command centers. Integrate Navy readiness data with joint GSORTS databases and applications to facilitate joint operation preparation. Continue developing Force Planning tools to support Navy Mission Essential Task List (NMETL and Navy/Joint Universal Task List (MUTL/JUTL). Provide an integrated product that enables users to develop scheduling data based upon input on force readiness.

- (U) ($150) Port WSM to PC and provide capability to advance WSM display to time periods specified by the operator. Provide capability to incorporate three dimensional WSM deconfliction processing.

- (U) ($150) Develop AAW HCI & Situational Awareness (SA) tactical decision aids to support USN AAW missions in a joint/coalition environment. Interface/Utilize Tadil capabilities to provide AAW SA to non-CDS equipped units that are not equipped with intelligence repositories.

- (U) ($500) Provide an integrated solution for providing all services that support the generation of pre-flight mission objective briefs, interface with inflight aircraft to transmit and receive imagery and Link data, and fuse completed mission data to provide post-mission analysis and review. The aircraft support suite will maximize us of COTS PC tools to interface with legacy databases and provide easy-to-use processing tools for brief generation. Mission status board applications will interface directly with remote mission event databases to enable online electronic editing during mission. Imagery and data transfer tools will be built using commercial protocols to enable TSCs to interoperate with NATO and Joint platforms. Pre and Post-Flight analysis tools will integrate with web technologies to permit remote queries from disadvantaged sites.

- (U) ($360) Enhance the C2WC decision aid & tools to take advantage of new/emerging sensors (organic & national). Develop and implement C2WC capabilities to exploit national and theater EW/OOB databases (MIDB, EPL, etc.). Investigate providing C2WC capabilities to selected surface combatants.

- (U) ($150) Enhance pre-flight capabilities to enable analysis of environmental data, threat and force data, sensors, and target motion data to be performed on the joint intelligence database (MIDB). Enhance current implementation to support improvement of joint sensor data based on post-mission analysis.

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604231N PROJECT NUMBER: X0709
PROGRAM ELEMENT TITLE: Tactical Command System PROJECT TITLE: GCCS-M Maritime Apps

- (U) ($150) Develop architecture to integrate COTS Enterprise Management tools in GCCS-M Maritime Applications to support remote system diagnostics, LAN inventory, and remote software distribution and installation. Implementation will support low-bandwidth users and poorly connected sites.

- (U) ($200) Develop a FLTCAST product that provides web-based "info-cast" subscription capabilities for the fleet to access GCCS-M data using commercial web technology. Framework would provide plug-in capabilities so that external programs could interface with GCCS-M and re-use the existing framework to distribute data, documentation, and training.

- (U) ($250) Design parsers that interface with the DII COE messaging products to populate tactical databases for GCCS-M Maritime Applications. Provide plug-in parsers that maximize integration between the track database and relational analysis databases, and are interoperable with the USMTF message format certification and DMS.

- (U) ($300) Provides funding to cover Operational Test Planning and Execution by COTF OTD's during planned OPEVAL (OT), Operational Assessment (OA) and Follow-on Test and Evaluation (FOT&E),

- (U) ($1,600) Provides funding to cover Development Test phases in lab and operational sites for GCCS-M segments. Also covers any certification, compliancy (DII COE), and functional testing for each segment. Acceptance and development testing includes joint certifications, compliancy with the DII COE and security policies, and functional testing for each segment. Funding will also be used to support the Test IPT and TPWG process used by program.

- (U) ($150) Continue integration of GCCS SW in shore and shipboard environments, including incorporation of Navy specific functionality. Fielding of the Maritime variant would be interoperable with the joint GCCS system on the same network enabling seamless exchange of tactical data between platforms.

- (U) ($100) Continue development of an automated mechanism to register and catalogue software submissions for all GCCS-M development, integration and test software builds.

- (U) ($90) Provide an interface with the NAVSSI system to display navigation data on the common tactical picture. Integration includes designing and application that enables GCCS-M to utilize a shared digital map server.

- (U) ($400) Development of a common GCCS-M infrastructure to support the network-centric warfare concept. Design would maximize processing power of current server applications while enabling clients powered with minimal COTS

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604231N PROJECT NUMBER: X0709
PROGRAM ELEMENT TITLE: Tactical Command System PROJECT TITLE: GCCS-M Maritime Apps

tools to access data in a traditional 3-tier architecture. Focus will include portable capability to support disembarked operations for Expeditionary Warfare.

- (U) ($297) Combat Systems Integration: Develop and Implement integration with GCCS-M and Aegis/non-Aegis combat systems to achieve intra and inter ship interoperability with the common operational picture, including systems such as a ATWCS, TTWCS, and AADC.
- (U) ($100) Provide engineering and integration testing to the IT-21 Integration Test Facility to ensure that GCCS-M Maritime Applications applications operate effectively in the IT-21 ARM LAND and System environment.

(U) PROGRAM CHANGE SUMMARY: FY 1998: SBIR reduction of ($-133K), DD1002: April 1998 update ($-73K), FY1998 June BTR update ($-9K), FY 98 update ($-12). Net change was ($-227K).

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

	FY 1998 ACTUAL	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	COST TO COMPLETE	TOTAL PROGRAM
(U) OMN	9,562	15,542	12,839	17,435	16,515	17,297	17,823	17,896	CONT.	CONT.

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

C. (U) ACQUISITION STRATEGY:

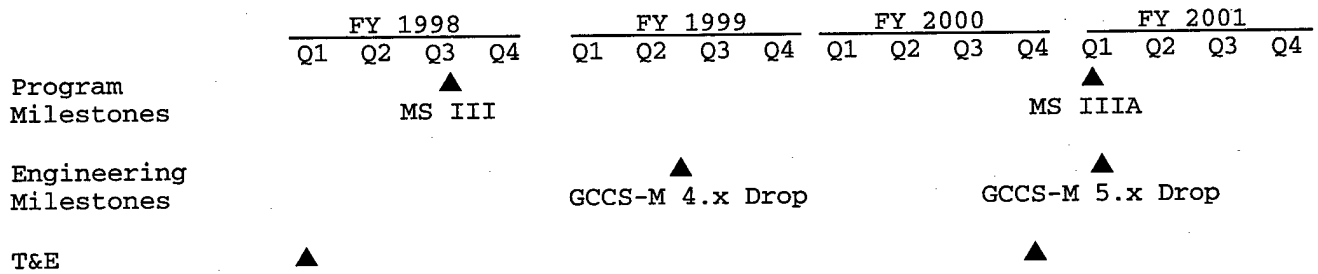


EXHIBIT R-2a, RDT&E,N Project Justification

DATE: February 1999

BUDGET ACTIVITY: 5

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

PROJECT NUMBER: X0709
PROJECT TITLE: GCCS-M Maritime Apps

Milestones	DT/OT III	DT/OT IIIA
Contract Milestones		

D. (U) SCHEDULE PROFILE: See paragraph C.

FY 2000 President's Budget Estimates

EXHIBIT R-3, RDT&E,N Project Cost Analysis

DATE: February 1999

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604231N

PROGRAM ELEMENT TITLE: Tactical Command System

PROJECT NUMBER: X0709

PROJECT TITLE: GCCS-M Maritime Apps

Cost Categories	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date	FY01 Cost	FY01 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Software Development	Various	Various	18,122	7,825	Var.	4,335	Var.			CONT.	CONT.	
Subtotal Product Development	Various	Various	18,122	7,825	Var.	4,335	Var.			CONT.	CONT.	

Remarks:

System Engineering	Various	Various	6,514	2,175	Var.	1,630	Var.			CONT.	CONT.	
Subtotal Support	Various	Various	6,514	2,175	Var.	1,630	Var.			CONT.	CONT.	

Remarks

FY 2000 President's Budget Estimates

EXHIBIT R-3, RDT&E,N Project Cost Analysis DATE: February 1999

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604231N PROJECT NUMBER: X0709
PROGRAM ELEMENT TITLE: Tactical Command System PROJECT TITLE: GCCS-M Maritime Apps

Cost Categories	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date	FY01 Cost	FY01 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Operational Test & Evaluation	PD	OPTEVFOR	1,015	75	10/98	75	10/99			CONT.	CONT.	
Subtotal T&E	PD	OPTEVFOR	1,015	75	10/98	75	10/99			CONT.	CONT.	
Remarks												
Program Management	Various	Various	6,015	650	Var.	675	Var.			CONT.	CONT.	
Subtotal Management	Various	Various	6,015	650	Var.	675	Var.			CONT.	CONT.	
Remarks												
Total Cost	Various	Various	31,666	10,725	Var.	6,715	Var.			CONT.	CONT.	

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

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1998 ACTUAL	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	COST TO COMPLETE	TOTAL PROGRAM
X2009 JMCIS OBU Evolutionary Development	1,932	1,934	2,134	2,207	2,106	1,987	2,204	2,355	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.
(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1998 ACCOMPLISHMENTS:

- (U) ($387) Integrate key JMCIS warfare components (EW segments) into OED MLS software baseline.

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

- (U) ($604) 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) ($33) 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 PLAN:

- (U) ($285) Implement, accredit and deploy MLS changes needed to support email-based and DMS record message traffic.
- (U) ($439) Develop and deploy wide area imagery, site, and characteristics databases using an object-oriented MLS commercial database package.
- (U) ($754) 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) ($121) Upgrade system capabilities for providing tailored MLS support.
- (U) ($335) Incorporate current state of art data correlation and data fusion software and hardware technology.

3. (U) FY 2000 PLAN:

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

- (U) ($285) Implement, accredit and deploy MLS changes needed to support email-based and DMS record message traffic.
- (U) ($439) Update message encoders, decoders and correlation algorithms as required to meet formatted MSG standards and changes in sensor data feeds.
- (U) ($761) 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) ($313) Upgrade system interface capabilities as required for current releases for record communications systems, (e.g., CSP, NEWSDEALER) with in an accreditable MLS baseline.
- (U) ($336) Implement improved tactical decision aids, and system alerting capabilities

(U) PROGRAM CHANGE SUMMARY: FY 1998: SBIR reduction of ($-32K), DD1002: April 1998 update ($-23K), FY1998 June BTR update ($-4K),FY 98 update ($-4K). Net change was ($-63K).

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

	FY 1998 ACTUAL	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	COST TO COMPLETE	TOTAL PROGRAM
OMN 1C1C/4B7N	1,789	1,233	1,207	1,161	1,351	1,321	1,325	1,359	CONT.	CONT.

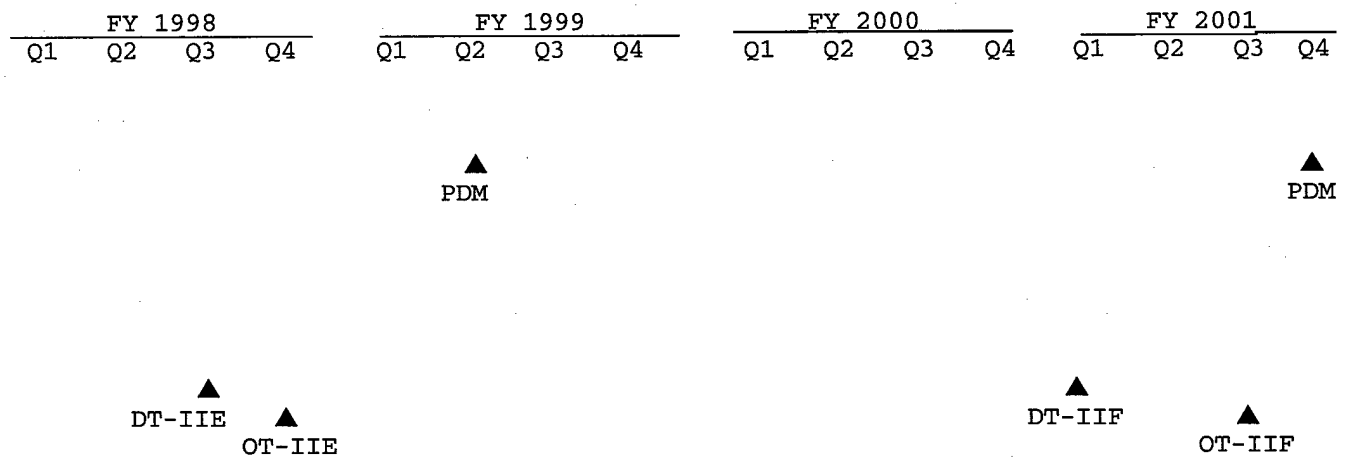
(U) RELATED RDT&E: Not applicable.

FY 2000 President's Budget Estimates

EXHIBIT R-2a, RDT&E,N Project Justification DATE: February 1999

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

C. (U) ACQUISITION STRATEGY:



Note: Dates reflect proposed APB Milestones.

D. (U) SCHEDULE PROFILE: See paragraph C.

FY 2000 President's Budget Estimates

EXHIBIT R-3, RDT&E,N Project Cost Analysis DATE: February 1999

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

Cost Categories	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date	FY01 Cost	FY01 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Software/Product Development	Radius	NAVSUP	26,652	1,500	Var.	1,518	Var.			CONT.	CONT.	
Software/Product Development	Various	Various	3,990	100	Var.	211	Var.			CONT.	CONT.	
Subtotal Product Development	Various	Various	30,642	1,600	Var.	1,729	Var.			CONT.	CONT.	
Remarks:												
System Engineering	WX	Various	7,750	229	Var.	300	Var.			CONT.	CONT.	
Subtotal Support	Various	Various	7,750	229	Var.	300	Var.			CONT.	CONT.	
Remarks												

FY 2000 President's Budget Estimates

EXHIBIT R-3, RDT&E,N Project Cost Analysis DATE: February 1999

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

Cost Categories	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date	FY01 Cost	FY01 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Operational Test & Evaluation	PD	OPTEVFOR	570	30	Var.	30	Var.			CONT.	CONT.	
Subtotal T&E	PD	OPTEVFOR	570	30	Var.	30	Var.			CONT.	CONT.	
Remarks												
Project Management	Various	Various	1,795	75	Var.	75	Var.			CONT.	CONT.	
Subtotal Management	Various	Various	1,795	75	Var.	75	Var.			CONT.	CONT.	
Remarks												
Total Cost	Various	Various	40,757	1,934	Var.	2,134	Var.			CONT.	CONT.	
Remarks												

FY 2000 President's Budget Estimates

EXHIBIT R-2a, RDT&E,N Project Justification DATE: February 1999

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 1998 ACTUAL	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	COST TO COMPLETE	TOTAL PROGRAM
X2041 JMCIS Ashore	5,966	0	0	0	0	0	0	0	0	5,966

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Chief of Naval Operations (CNO), Fleet Commanders in Chief (FLTCINCs), Unified Commanders (USCINCLANT and USCINCPAC), and Type Commanders (SUBLANT, SUBPAC, SURFLANT, SURFPAC, AIRLANT, and AIRPAC) require a single, integrated command and control system at the Navy Command Center (NCC), Fleet Command Centers (FCC), Unified Command Centers, and TYCOM 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 users.

OSS (designated JMCIS Ashore) Increment I integrated existing prototype command center support systems on a Local Area Network (LAN) and provided a baseline command center support capability to designated OSS sites.

Increment II developed an integrated, logistically supportable, and cost effective single system, which utilizes the latest state-of-the-art Commercial Off The Shelf (COTS) technologies to support both local and remote users. Specifically, Increment II incorporated an Ocean Surveillance Information System (OSIS) Baseline Upgrade (OBU) interface, replaced the Navy Worldwide Military Command and Control System (WWMCCS) Software Standardization (NWSS), and improved the initially fielded Naval Status of Forces (NSOF) functionality.

Increment III incorporated initial capabilities for Anti-Submarine Warfare (ASW) at former Force High Level Terminal (FHLT) sites, Shore Targeting (STOSS) at former Shore Targeting Terminal (STT) sites, Water Space Management (WSM) at selected sites, Employment Scheduling System (ESS) at TYCOM sites, and Information Presentation and Distribution System (IPDS) at selected JMCIS Ashore sites. Increment III continues to incorporate initial Global Command and Control System (GCCS) interfaces for Joint inter-operability, to achieve initial DII COE compliance, and to begin porting JMCIS Ashore software to PCs. Increment III will continue to improve employment planning and scheduling capabilities by replacing ESS and PC EMPSKD, and incorporating TYCOM required databases and decision aids.

JMCIS Programs (including JMCIS Ashore) will combine into a single GCCS-M Program. JMCIS Ashore Increment III will be followed by GCCS-M Increment I. JMCIS Ashore funding will transfer to the GCCS-M Program beginning with FY 99.

EXHIBIT R-2a, RDT&E,N Project Justification DATE: February 1999

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604231N PROJECT NUMBER: X2041
PROGRAM ELEMENT TITLE: Tactical Command System PROJECT TITLE: JMCIS Ashore

GCCS-M Increment I will incorporate Multi-Level Security features as they become commercially available, Information Technology for the 21st Century (IT-21) network centric warfare, continue GCCS inter-operability improvements, and increase the level of DII COE compliance.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1998 ACCOMPLISHMENTS:

- (U) ($357) 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) ($376) Plan, conduct systems engineering and prototype development of object oriented/design solution into JMCIS Ashore to improve system performance.
- (U) ($459) 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).
- (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).

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604231N PROJECT NUMBER: X2041
PROGRAM ELEMENT TITLE: Tactical Command System PROJECT TITLE: JMCIS Ashore

- (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.
- (U) ($19) Integrate and make interoperable JMCIS Ashore ASW capability with Joint ASW functionality.

FY 2000 President's Budget Estimates

EXHIBIT R-2a, RDT&E,N Project Justification DATE: February 1999

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604231N PROJECT NUMBER: X2041
PROGRAM ELEMENT TITLE: Tactical Command System PROJECT TITLE: JMCIS Ashore

2. (U) FY 1999 PLAN: JMCIS Ashore funding will transfer to the GCCS-M Program beginning with FY 99.

(U) PROGRAM CHANGE SUMMARY: FY 1998: SBIR reduction of ($-161K), DD1002: April 1998 update ($-172K), FY1998 June BTR update ($-6K), FY 98 update ($-13K). Net change was ($-352K).

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

	FY 1998 ACTUAL	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	COST TO COMPLETE	TOTAL PROGRAM
(U) OMN	13,230	10,302	10,950	10,024	11,308	12,341	12,693	13,029	CONT.	CONT.

(U) RELATED RDT&E:

(U) PE 0604231N: JMCIS OED, JMCIS Tactical/Mobile, GCCS-M Maritime Applications, and GCCS-M Common Applications

C. (U) ACQUISITION STRATEGY:

	FY 1998				FY 1999				FY 2000				FY 2001			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Program Milestones			▲ MS III													
Engineering Milestones																
T&E Milestones		▲ DT/OT						III								
Contract Milestones																

Funding Transferred to GCCS-M in FY 1999

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604231N PROJECT NUMBER: X2041
PROGRAM ELEMENT TITLE: Tactical Command System PROJECT TITLE: JMCIS Ashore

D. (U) SCHEDULE PROFILE: See paragraph C.

EXHIBIT R-2a, RDT&E,N Project Justification DATE: February 1999

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604231N PROJECT NUMBER: X0521
PROGRAM ELEMENT TITLE: Tactical Command System PROJECT TITLE: GCCS-M Intel Apps

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1998 ACTUAL	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	COST TO COMPLETE	TOTAL PROGRAM
X0521 GCCS-M I Intelligence Apps (formerly Shipboard Tactical Intelligence Processing (STIP))	5,307	6,717	6,737	7,037	6,877	7,665	7,492	7,923	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 GCCS-M, 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 98/99 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 GCCS-M initiative to capitalize on the latest Web/PC industry/commercial technology. STIP is part of the Tactical Intelligence and Related Activities (TIARA) program, managed by the Secretary of Defense through the Assistant Secretary of Defense for C4I.

EXHIBIT R-2a, RDT&E,N Project Justification DATE: February 1999

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604231N PROJECT NUMBER: X0521
PROGRAM ELEMENT TITLE: Tactical Command System PROJECT TITLE: GCCS-M Intel Apps

1. (U) FY 1998 ACCOMPLISHMENTS:

- (U) ($1,055) 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) ($961) 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) ($225) 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) ($414) 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) ($725) 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.

- (U) ($668) Continue object-oriented database exploratory development.

- (U) ($379) 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.

2. (U) FY 1999 PLAN: (JMCIS transitioned to GCCS-M in FY98)

- (U) ($1,228) 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) ($1,072) 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 GCCS-M -"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.

- (U) ($788) Continue evolving Navy-USMC Team unique intel and intel-related data base support for GCCS-M and MAGTFC4I/Expeditionary Warfare applications as required outside MIDB capability.

- (U) ($733) Continue object-oriented database 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 GCCS-M 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 GCCS-M 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.

3. (U) FY 2000 PLAN:

- (U) ($350) Continue migration of Intelligence Correlation Tools (e.g. Gale Lite, NRTI/Binocular) into GCCS-M, conforming to DII COE and to meet validated fleet requirements.

- (U) ($240) Continue migration of JDISS stand-alone intelligence system tools into a GCCS-M application, which will create an integrated afloat intelligence architecture.

- (U) ($515) Continue integration of Radiant Mercury (RM) capability into GCCS-M 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) ($788) Continue evolving Navy-USMC Team unique intelligence and intelligence-related database support for GCCS-M and MAGTFC4I/Expeditionary Warfare applications as required outside MIDB capability.

- (U) ($1,012) Continue developing, integrating and testing advanced digital imagery server and Navy-Marine Team unique client applications to keep pace with evolving CIO, DARO and NRO imagery architectures.

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604231N PROJECT NUMBER: X0521
PROGRAM ELEMENT TITLE: Tactical Command System PROJECT TITLE: GCCS-I Intel Apps

- (U) ($1,185) Continue developing, integrating and testing MIDB (v 2.0, 3.0, 4.0 etc.) based CDBS (GENSER and SCI) and associated intelligence applications in accordance with GCCS-I3 evolutionary directions and in conjunction with Cryptologic/C2W and other Warfare Commander developments.

- (U) ($500) Continue development of the Modernized Integrated Database (MIDB) replication in GCCS-M 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) ($300) Continue migration development of Intelligence and Imagery segments to meet fleet IT21 requirements (PC/NT) and DII COE.

- (U) ($400) Implement new fleet validated GCCS-I^3 Intelligence Functional Working Group and Copernicus Requirements Working Group (CRWG) requirements. Develop an automated mechanism to register and catalogue software submissions for all GCCS-I^3 development, integration and test software builds.

- (U) ($526) Develop Navy Portion for imagery access and manipulation components of the Joint Targeting Toolbox, a proposed uniform set of targeting applications validated by all Services.

- (U) ($409) Continue development and test enhancements to unit level GCCS-M Afloat intelligence capabilities including access to imagery and associated support data; e.g., C&P.

- (U) ($262) Continue testing of OBU/OED intelligence capability with GCCS-M development; provide OED-unique intelligence tools afloat.

- (U) ($250) Develop Prototype Rapid Targeting Technologies for GCCS-I^3.

(U) PROGRAM CHANGE SUMMARY: FY 1998: SBIR reduction of ($-87K), DD1002: April 1998 update ($+485K), FY 98 update ($-10K). Net change was ($+388K).

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

FY 2000 President's Budget Estimates

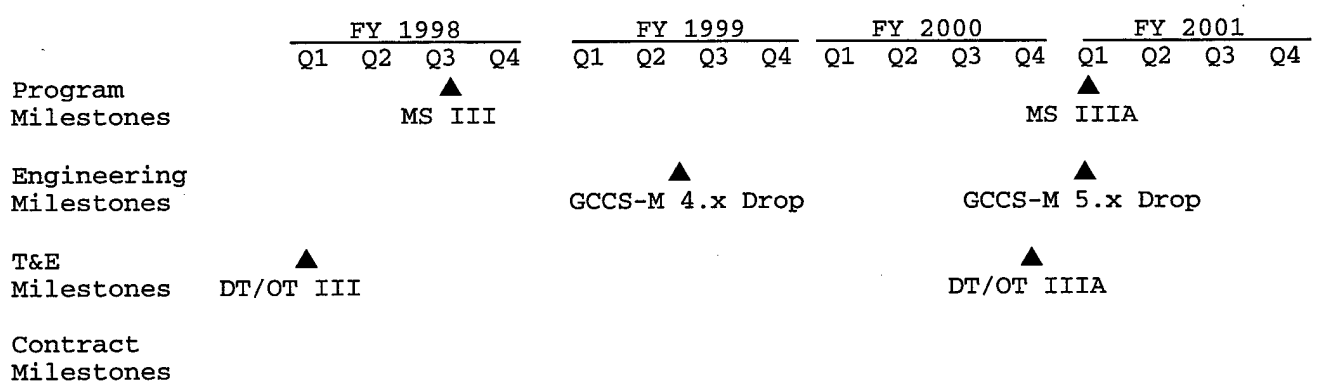
EXHIBIT R-2a, RDT&E,N Project Justification DATE: February 1999

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604231N PROJECT NUMBER: X0521
PROGRAM ELEMENT TITLE: Tactical Command System PROJECT TITLE: GCCS-I Intel Apps

	FY 1998 ACTUAL	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	COST TO COMPLETE	TOTAL PROGRAM
(U) OMN	9,562	15,542	12,839	17,435	16,515	17,297	17,823	17,896	CONT.	CONT.

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

C. (U) ACQUISITION STRATEGY:



D. (U) SCHEDULE PROFILE: See paragraph C.

FY 2000 President's Budget Estimates

EXHIBIT R-3 RDT&E,N Project Cost Analysis DATE: February 1999

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604231N PROJECT NUMBER: X0521
PROGRAM ELEMENT TITLE: Tactical Command System PROJECT TITLE: GCCS-M Intel Apps

Cost Categories	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date	FY01 Cost	FY01 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Software/Product Development	Various	Various	4,745	4,224	12/98.	3,684	12/99			CONT.	CONT.	
Subtotal Product Development	Various	Various	4,745	4,224	12/98.	3,684	12/99			CONT.	CONT.	
Remarks:												
System Engineering	Various	Various	9,810	2,368	12/98	2,923	12/99			CONT.	CONT.	
Subtotal Support	Various	Various	9,810	2,368	12/98.	2,923	12/99			CONT.	CONT.	
Remarks												

FY 2000 President's Budget Estimates

EXHIBIT R-3, RDT&E,N Project Cost Analysis DATE: February 1999

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604231N PROJECT NUMBER: X0521
PROGRAM ELEMENT TITLE: Tactical Command System PROJECT TITLE: GCCS-I Intel Apps

Cost Categories	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date	FY01 Cost	FY01 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Operational Test & Evaluation	PD	OPTEVFOR	1,981	75	12/98	75	12/99.			CONT.	CONT.	
Subtotal T&E	PD	OPTEVFOR	1,981	75	12/98	75	12/99			CONT.	CONT.	
Remarks												
Project Management	CPFF	Various	569	15	Var.	19	Var.			CONT.	CONT.	
Travel	WR	HQ	1,340	35	Var.	36	Var.			CONT.	CONT.	
Subtotal Management	Various	Various	1,909	50	Var.	55	Var.			CONT.	CONT.	
Remarks												
Total Cost	Various	Various	18,445	6,717	Var.	6,737	Var.			CONT.	CONT.	
Remarks												

FY 2000 President's Budget Estimates

EXHIBIT R-2a, RDT&E,N Project Justification DATE: February 1999

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604231N PROJECT NUMBER: X2215
PROGRAM ELEMENT TITLE: Tactical Command System PROJECT TITLE: Joint Interoperability

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1998 ACTUAL	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	COST TO COMPLETE	TOTAL PROGRAM
X2215 Joint Interoperability	0	0	0	0	0	0	0	0	0	0

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. Joint Interoperability funding will transfer to the GCCS-M Program beginning with FY 99.

EXHIBIT R-2a, RDT&E,N Project Justification DATE: February 1999

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 1998 ACCOMPLISHMENTS:

   - (U) Not Applicable.

2. (U) FY 1999 PLAN:

   - (U) Joint Interoperability funding will transfer to the GCCS-M Program beginning with FY 99.

(U) PROGRAM CHANGE SUMMARY: Not Applicable

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

C. (U) ACQUISITION STRATEGY:

	FY 1998				FY 1999				FY 2000				FY 2001			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Program Milestones			▲ MS III													
Engineering Milestones																
T&E Milestones	▲ DT/OT III															
Contract Milestones																

Funding Transferred to GCCS-M in FY 1999

D. (U) SCHEDULE PROFILE: See paragraph C.

FY 2000 President's Budget Estimates

EXHIBIT R-2a, RDT&E,N Project Justification DATE: February 1999

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604231N PROJECT NUMBER: X2216
PROGRAM ELEMENT TITLE: Tactical Command System PROJECT TITLE: C4I For Joint Littoral Warfare

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1998 ACTUAL	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	COST TO COMPLETE	TOTAL PROGRAM
X2216 C4I for Joint Littoral Warfare (JLW)	0	0	0	0	0	0	0	0	0	0

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. C4I for Joint Littoral Warfare (JLW) funding will transfer to the GCCS-M Program beginning with FY 99.

FY 2000 President's Budget Estimates

EXHIBIT R-2a, RDT&E,N Project Justification DATE: February 1999

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 1998 ACCOMPLISHMENTS:

- (U) Not Applicable.

2. (U) FY 1999 PLAN:

(U) C4I for Joint Littoral Warfare (JLW) funding will transfer to the GCCS-M Program beginning with FY 99.

(U) PROGRAM CHANGE SUMMARY: Not Applicable

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

C. (U) ACQUISITION STRATEGY:

	FY 1998				FY 1999				FY 2000				FY 2001			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Program Milestones			▲ MS III													
Engineering Milestones																
T&E Milestones	▲ DT/OT III															
Contract Milestones																

Funding Transferred to GCCS-M in FY 1999

D. (U) SCHEDULE PROFILE: See paragraph C.

FY 2000 President's Budget Estimates

EXHIBIT R-2a, RDT&E,N Project Justification DATE: February 1999

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604231N PROJECT NUMBER: X2305
PROGRAM ELEMENT TITLE: Tactical Command System PROJECT TITLE: GCCS-M Common Apps

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1998 ACTUAL	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY2005 ESTIMATE	COST TO COMPLETE	TOTAL PROGRAM
X2305 GCCS-M Common Apps (formerly Navy COE)	1,681	12,987	13,448	15,090	17,381	18,791	18,923	19,063	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: Design, develop, update, integrate, test, configuration manage, support and evolve the Navy utilization and system implementation of the Defense Information Infrastructure Common Operating Environment (DII COE), based on the Joint Defense Information Infrastructure (DII) COE, for all Naval C4I Systems. The GCCS-M Common Apps program contains the fundamental building blocks and common applications for all of our fielded Global Command and Control System (Maritime) 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.

The Navy COE program is a core function of the GCCS-M Common Apps in that it serves as the system integration point for command and control systems in the Naval services. The program has the responsibility of working with developers throughout the Navy to incorporate the requirements of their users so that they might quickly and efficiently integrate and transform present stovepipe capabilities into an interoperable C4I architecture. 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.

Beginning in FY 99 and continuing in FY 00, this line is renamed GCCS-M Common Applications and incorporates previously separate Joint Interoperability (604231N X2215), C4I for Joint Littoral Warfare (604231N X2216), JMCIS Ashore (604231N X2041) and portions of JMCIS Afloat (604231N X0709) which were common across GCCS-M variants). Under these functions, GCCS-M Common Apps expands to include all C4I applications required to fully support Navy joint interoperability in the littoral environment, and includes all common functions such as track database management, message processing, display implementation, correlation and system architecture migration in order to ensure a coherent and consistent implementation of C4I architectures in the Fleet.

BUDGET ACTIVITY: 5
PROGRAM ELEMENT: 0604231N
PROGRAM ELEMENT TITLE: Tactical Command System
PROJECT NUMBER: X2305
PROJECT TITLE: GCCS-M Common Apps

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1998 ACCOMPLISHMENTS:

- (U) ($200) Improve processes for integrating to the COE and develop supporting program documentation. Maintain the on-line software library that 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) ($1,099) 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.

2. (U) FY 1999 PLAN:

- (U) ($189) 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. Obtain and manage COTS licenses. Upgrade Application Programmer Interfaces to improve the GCCS-M 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.

BUDGET ACTIVITY: 5
PROGRAM ELEMENT: 0604231N PROJECT NUMBER: X2305
PROGRAM ELEMENT TITLE: Tactical Command System PROJECT TITLE: GCCS-M Common Apps

- (U) ($345) Support developmental testing leading to an OT IIA leading to a Milestone IIIA decision (FY00) for fleet release and installation of GCCS-M 4.X.
- (U) ($450) Continue to integrate/analyze GCCS-M 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 GCCS-M Ashore to improve system performance.
- (U) ($270) Continue development of database modules to support WAN access by GCCS-M Ashore remote users, i.e., distributed databases and data standardization.
- (U) ($225) Update GCCS-M 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 GCCS-M Ashore software.

BUDGET ACTIVITY: 5
PROGRAM ELEMENT: 0604231N PROJECT NUMBER: X2305
PROGRAM ELEMENT TITLE: Tactical Command System PROJECT TITLE: GCCS-M Common Apps

- (U) ($475) Continue extension of full GCCS-M Ashore access and functionality into PC domain consistent with FLTCINC and TYCOM requirements.
- (U) ($225) Port GCCS-M 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 GCCS-M 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) ($345) Incorporate decision aids, data elements, and message formats and reports to support Navy blockage enforcement, choke point, port evacuation Navy Control of Shipping (NCS) operations, and other Navy missions associated with Operations other than War.
- (U) ($208) Maintain compatibility with Defense Messaging System (DMS)/Automated Message Handling System software requirements.
- (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) ($250) 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 for joint interoperability.

- (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.
- (U) ($385) Perform system requirements analysis and systems design.
- (U) ($166) Develop program documentation and data for JLW.
- (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 GCCS-M C4I systems architecture and update/integrate GCCS-M 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 GCCS-M/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/GCCS-M Systems Integration.
- (U) ($300) Conduct JLW Developmental Testing.
- (U) ($200) Complete an JLW initial OA.

3. (U) FY 2000 PLAN:

- (U) ($450) Implementation of Real-time capabilities into DII COE in order to support migration of high performance systems to GCCS-M architecture.

- (U) ($100) Continue development of program documents and data.
- (U) ($400) Evolve the USN C4I messaging architecture to incorporate emerging DII-COE based messaging components (e.g. CMP, DMS, etc.)

- (U) ($750) Define and establish the PC/NT Common Operating Environment, Initiate the migration of Unix based segments and applications to the NT COE.
- (U) ($475) Define and develop the system architecture and products to evolve USN C4I systems from a FOTC/OTCIXS/BGBDM based network towards one that takes advantage of TCP/IP, LANs, and WANs (JMCOMS/ADNS, and SIPRNET)
- (U) ($200) Implement INFOSEC products into the C4I software architecture
- (U) ($350) Investigate DII-COE compliant multi-source and multi-sensor correlation and fusion software segment development to Navy, Joint, and coalition COPs
- (U) ($300) Development and implementation of integrated shipboard architectures which utilize common set of NIMA product services / servers
- (U) ($350) Development and implementation of core capabilities associated with strategic and tactical C4I management of TBM data and tools for decision making and COP fusion of TBMD data
- (U) ($175) Development and implementation of Mil-std-2525A and supplemental symbology to support COP fusion and display
- (U) ($350) Development and implementation of interoperable architectures for integration of PLI data in the COP
- (U) ($2,500) Implementation of DISA provided DII COE for Navy Customers, for each DII COE build, including rollup of operating system/kernal, application of patches/fixes, development and application of maritime extensions of SW fixes, and implementation of Navy-unique ECP's in DII COE

- (U) ($500) Develop the 3-tier architecture (Data Servers, application servers, display & presentation) to support the transition of the USN C4I from the current client/server model. This will streamline the data maintenance function to data centers, and improve timeliness and accuracy of data to the warfighter.
- (U) ($200) Enhance MTI autotrack generation capabilities for JSTARS data.
- (U) ($1,300) Complete 2-way TADIL J and incorporate Multi-tadil correlation.
- (U) ($200) Incorporate TBMCS aboard USN Flagships (LCC, AGF, CV/CVN) and develop the required interfaces, procedures to interoperate with GCCS-M.
- (U) ($100) Develop/Enhance Interface support for Mission Planning Systems
- (U) ($250) Incorporate USMC MAGTF C4I based systems aboard USN amphibious and command ships (LCC, AGF, etc.). Develop Conops/procedures and interfaces to support joint amphibious warfare for embarked/disembarked Marine Corp. elements
- (U) ($250) Develop/Enhance/Incorporate tools and functionality that supports joint and coalition C4I warfare. Develop Conops/procedures/tests/exercises that implement coalition interoperability.
- (U) ($250) Develop interfaces/Conops/procedures to take advantage of the LAN/WAN commonizations provided by JMCOMS/ADNS. Perform land and sea based testing of the integrated C4I architecture.
- (U) ($100) Develop capability for automatic interface and update with SIIP and METOC.
- (U) ($175) Investigate latest COTS H/W and S/W to implement a digital video system solution to accomplish full motion video transmission intra-ship, inter-ship, and ship to shore.
- (U) ($250) Design/Develop Security Architecture for Naval C4I systems
- (U) ($125) Continue hardware design & development, including investigation of space saving COTS available GCCS-M compatible hardware for use in confined spaces on board submarines, and investigation of latest COTS display and large screen projector technology for use in GCCS-M C3I system.

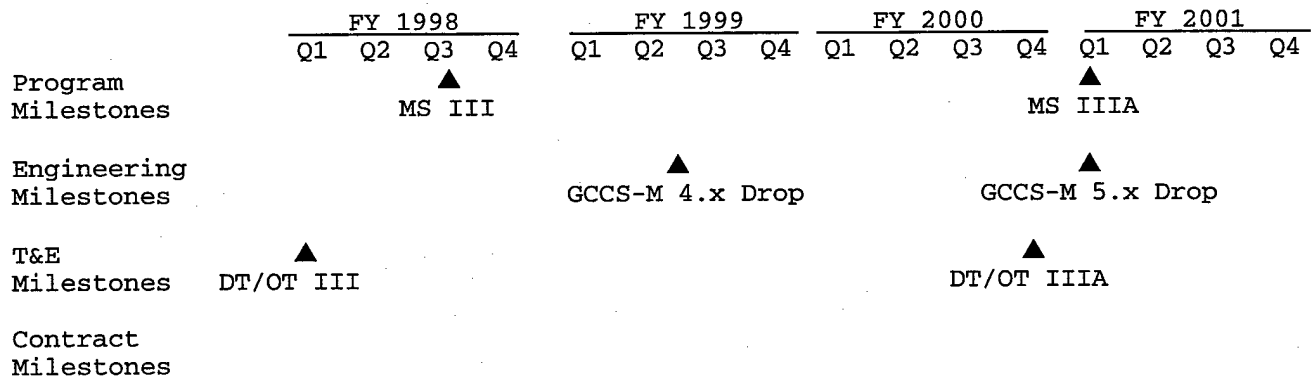
BUDGET ACTIVITY: 5
PROGRAM ELEMENT: 0604231N
PROGRAM ELEMENT TITLE: Tactical Command System
PROJECT NUMBER: X2305
PROJECT TITLE: GCCS-M Common Apps

- (U) ($1,177) Semi-annual testing of each DII COE build received from DISA, documentation and CM of required STR processes, and distribution to Navy DII COE customers
- (U) ($325) Support the proof of concept testing in exercise environments of emerging technology in the C4I arena.
- (U) ($300) Develop and Implement modeling and simulation in support of testing/exercises
- (U) ($900) Perform systems testing on the integrated components of the Naval C4I architecture
- (U) ($646) Design and develop systems documentation to support test, evaluation, and fielding of C4I systems

(U) PROGRAM CHANGE SUMMARY: FY 1998: DD1002: April 1998 update ($-22K), FY1998 June BTR update ($-200K), FY 98 update ($-22K). Net change was ($-244K).

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

C. (U) ACQUISITION STRATEGY:



BUDGET ACTIVITY: 5
PROGRAM ELEMENT: 0604231N
PROGRAM ELEMENT TITLE: Tactical Command System
PROJECT NUMBER: X2305
PROJECT TITLE: GCCS-M Common Apps

D. (U) SCHEDULE PROFILE: See paragraph C.

FY 2000 President's Budget Estimates

EXHIBIT R-3, RDT&E,N Project Cost Analysis DATE: February 1999

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604231N PROJECT NUMBER: X2305
PROGRAM ELEMENT TITLE: Tactical Command System PROJECT TITLE: GCCS-M Common Apps

Cost Categories	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date	FY01 Cost	FY01 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Software/Product Development	CPFF	INRI, Reston, VA	1,843	1,810.	10/98	3,900	10/99			CONT.	CONT	
Software/Product Development	WX	SSC-San Diego	0	0		1,116	10/99			CONT.	CONT	
Software/Product Development	CPFF	Delfin	0	0		1,400	10/99			CONT.	CONT	
Software/Product Development	Various	Various	0	9,100	10/98	2,082	10/99			CONT.	CONT	
Subtotal Product Development	Various	Various	1,865	10,910.	10/98	8,498	Var.			CONT.	CONT	
Remarks:												
System Engineering	WX	SSC-San Diego	0	0		800	10/99			CONT.	CONT	
System Engineering	CPFF	INRI, Reston, VA	0	0		670	10/99			CONT.	CONT	
System Engineering	Various	Various	0	2,027	10/98	850	10/99			CONT.	CONT	
Subtotal Support	Various	Various	0	2,027		2,320	10/99			CONT.	CONT	
Remarks												

FY 2000 President's Budget Estimates

EXHIBIT R-3, RDT&E,N Project Cost Analysis DATE: February 1999

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604231N PROJECT NUMBER: X2305
PROGRAM ELEMENT TITLE: Tactical Command System PROJECT TITLE: GCCS-M Common Apps

Cost Categories	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date	FY01 Cost	FY01 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Operational Test & Evaluation	PD	OPTEVFOR				120	10/99			CONT.	CONT	
Operational Test & Evaluation	Various	NTCSI				60	10/99			CONT.	CONT	
Developmental Test & Eval.	WX	SSC-SD				1,700	10/99			CONT.	CONT	
Developmental Test & Eval.	Various	Various				100	10/99			CONT.	CONT	
Subtotal T&E						1,980	10/99			CONT.	CONT	
Remarks												
Project Management	Various	Various	60	50	Var.	450	Var.			CONT.	CONT	
Travel	Various	Various				200	Var.			CONT.	CONT	
Subtotal Management			60	50	Var.	650	Var.			CONT.	CONT	
Remarks												
Total Cost	Various	Various	1,903	12,987	Var.	13,448	Var.			CONT.	CONT	
Remarks												

FY 2000 President's Budget Estimates

EXHIBIT R-3, RDT&E,N Project Cost Analysis DATE: February 1999

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604231N PROJECT NUMBER: X2306
PROGRAM ELEMENT TITLE: Tactical Command System PROJECT TITLE: Naval Simulation System

PROJECT NUMBER & TITLE	FY 1998 ACTUAL	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	COST TO COMPLETE	TOTAL PROGRAM
X2306 Naval Simulation System	2,342	1,741	0	0	0	0	0	0	0	4,083

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

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604231N PROJECT NUMBER: X2306
PROGRAM ELEMENT TITLE: Tactical Command System PROJECT TITLE: Naval Simulation System

Accreditation (VV&A) and Configuration Control Management. In FY 2000 - FY2005, funding was withdrawn by Sponsor during POM.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1998 ACCOMPLISHMENTS:

- (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) ($677) 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) ($220) 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.

2. (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) ($295) Support the necessary subject matter expert review to provide VV&A and Configuration Control Management.

3. (U) FY 2000 PLAN:

- (U) Not Applicable
-

A. (U) PROGRAM CHANGE SUMMARY:

FY-1998 Minor Navy program adjustment of ($-37K), FA-18 fix of ($-13K)

FY-1999 Revised Economic Assumptions ($-4K), Civilian Personnel Underexecution ($-1K)

EXHIBIT R-2a, RDT&E,N Project Justification DATE: February 1999

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604231N PROJECT NUMBER: X2306
PROGRAM ELEMENT TITLE: Tactical Command System PROJECT TITLE: Naval Simulation System

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

C. (U) ACQUISITION STRATEGY: Not Applicable

D. (U) SCHEDULE PROFILE: Not Applicable

FY 2000 President's Budget Estimates

EXHIBIT R-2a, RDT&E,N Project Justification DATE: February 1999

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604231N PROJECT NUMBER: X2307
PROGRAM ELEMENT TITLE: Tactical Command System PROJECT TITLE: Shipboard LAN/WAN

(U) COST (Dollars in thousands)

PROJECT NUMBER TITLE	FY 1998 ACTUAL	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	COST TO COMPLETE	TOTAL PROGRAM
X2307 Shipboard LAN/WAN	478	434	0	467	416	459	539	551	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.

EXHIBIT R-2a, RDT&E,N Project Justification DATE: February 1999

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604231N PROJECT NUMBER: X2307
PROGRAM ELEMENT TITLE: Tactical Command System PROJECT TITLE: Shipboard LAN/WAN

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 1998 ACCOMPLISHMENTS:

- (U) ($366) Developed proof of concept plan for NTCSS data base replication, as it would be used in a production environment. Developed implementation plan for proof of concept.

- (U) ($112) Demonstrated the tactical and tactical support applications of commercial wireless and cellular communications technology. Developed Naval strategy to utilize the opportunities offered by mobile computing.

2. (U) FY 1999 PLAN:

- (U) ($434) Continue to incorporate state-of-the-art technologies and business process improvements into interfaces with tactical systems.

3. (U) FY 2000 PLAN: Not Applicable. Funds withdrawn during NAVCOMPT review.

(U) PROGRAM CHANGE SUMMARY:

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

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604231N PROJECT NUMBER: X2307
PROGRAM ELEMENT TITLE: Tactical Command System PROJECT TITLE: Shipboard LAN/WAN

	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	COST TO COMPLETE	TOTAL PROGRAM
(U) OPN	38,440	35,228	143,769	96,998	117,450	96,907	58,198	40,903	CONT.	CONT.
(U) O&MN	382	4,661	4,805	2,915	980	687	706	723	CONT.	CONT.

C. (U) ACQUISITION STRATEGY: Not applicable.

D. (U) SCHEDULE PROFILE: See paragraph C.

FY 2000 President's Budget Estimates

EXHIBIT R-2a, RDT&E,N Project Justification DATE: February 1999

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604231N PROJECT NUMBER: X2418
PROGRAM ELEMENT TITLE: Tactical Command System PROJECT TITLE: JSTARS

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1998 ACTUAL	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	COST TO COMPLETE	TOTAL PROGRAM
X2418 Joint Surveillance Target Attack Radar System (Joint STARS)	4,663	0	0	0	0	0	0	0	0	4,663

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: 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 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.

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604231N PROJECT NUMBER: X2418
PROGRAM ELEMENT TITLE: Tactical Command System PROJECT TITLE: JSTARS

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1998 ACCOMPLISHMENTS:

- (4,663) Provide Navy and Marine Corp. units JSTARS data to support situational awareness and targeting.

2. (U) FY 1999 ACCOMPLISHMENTS:

- Not Applicable

3. (U) FY 2000 ACCOMPLISHMENTS:

- Not Applicable

4. (U) FY 2001 ACCOMPLISHMENTS:

- Not Applicable

(U) PROGRAM CHANGE SUMMARY: FY 1998: Reflects SBIR reduction of $-134K, FY 98 update ($-55K).

C. (U) ACQUISITION STRATEGY: Not Applicable

D. (U) SCHEDULE PROFILE: See paragraph C.

EXHIBIT R-2, FY 2000 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5

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

(U) COST: (Dollars in Thousands)

Project Number & Title	FY 1998 Budget	FY 1999 Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete	Total Program
H2279 4BW/4BN Upgrade	81,290	120,254	157,683	108,820	50,023	19,876	12,758	0	0	629,723
TOTAL	**81,290***	**120,254***	**157,683**	**108,820**	**50,023**	**19,876**	**12,758**	**0**	**0**	**629,723**

Quantity of (4) RDT&E Engineering and Manufacturing Development (EMD) Articles were contracted for prior to FY98 and remanufacture will commence in FY99

* (H2419) reflects a Congressional transfer of $5.6M in FY98 and a Congressional plus-up of $23.4M in FY99

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 and special operations support; supporting arms coordination and aeromedical evacuation. Major modifications for both aircraft that remanufacture AH-1W/UH-1N's into AH-1Z/UH-1Y's include: a new 4-bladed, composite rotor system with semi-automatic bladefold, new performance matched transmissions, T700 Engine Digital Electronic Control Units (DECUs), new 4-bladed tail rotors and drive systems, more effective stabilizers, upgraded landing gear, tail pylon structural modifications, and common, fully integrated cockpits and avionics systems. This remanufacture will add 10,000 flight hours to AH-1Z/UH-1Y airframes. The fully integrated cockpits will reduce operator workload and improve situational awareness, thus increasing safety and reducing the rate of aircraft attrition. They will provide considerable growth potential for future weapon systems and avionics, which will significantly increase mission effectiveness and survivability. The cockpits will also include integration of on-board mission planning, communications, digital fire control, self-navigation, night targeting, and weapon systems management in nearly identical crew stations reducing training requirements. This remanufacture maximizes commonality between the two aircraft and provides 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 RDT&E because it encompasses Engineering and Manufacturing Development of new end-items prior to a production approval decision.

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604245N** **PROGRAM ELEMENT TITLE: USMC H-1 Upgrades**

PROJECT NUMBER: H2279/H2419 **PROJECT TITLE: 4BW/4BN Upgrade/UH-1 Upgrades**

(U) COST: (Dollars in Thousands)

Project Number & Title	FY 1998 Budget	FY 1999 Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete	Total Program
H2279 4BW/4BN Upgrade	81,290	120,254	157,683	108,820	50,023	19,876	12,758	0	0	629,723
TOTAL	**81,290***	**120,254***	**157,683**	**108,820**	**50,023**	**19,876**	**12,758**	**0**	**0**	**629,723**

Quantity of (4) RDT&E Engineering and Manufacturing Development (EMD) Articles were contracted for prior to FY98 and remanufacture will commence in FY99

* (H2419) reflects a Congressional transfer of $5.6M in FY98 and a Congressional plus-up of $23.4M in FY99

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 and special operations support; supporting arms coordination and aeromedical evacuation. Major modifications for both aircraft that remanufacture AH-1W/UH-1N's into AH-1Z/UH-1Y's include: a new 4-bladed, composite rotor system with semi-automatic bladefold, new performance matched transmissions, T700 Engine Digital Electronic Control Units (DECUs), new 4-bladed tail rotors and drive systems, more effective stabilizers, upgraded landing gear, tail pylon structural modifications, and common, fully integrated cockpits and avionics systems. This remanufacture will add 10,000 flight hours to AH-1Z/UH-1Y airframes. The fully integrated cockpits will reduce operator workload and improve situational awareness, thus increasing safety and reducing the rate of aircraft attrition. They will provide considerable growth potential for future weapon systems and avionics, which will significantly increase mission effectiveness and survivability. The cockpits will also include integration of on-board mission planning, communications, digital fire control, self-navigation, night targeting, and weapon systems management in nearly identical crew stations reducing training requirements. This remanufacture maximizes commonality between the two aircraft and provides needed improvements in crew and passenger survivability, payload, power available, endurance, range, airspeed, maneuverability and supportability.

EXHIBIT R-2a, FY 2000 BUDGET RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604245N** **PROGRAM ELEMENT TITLE: USMC H-1 Upgrades**

PROJECT NUMBER: H2279/H2419 **PROJECT TITLE: 4BW/4BN Upgrade/UH-1 Upgrades**

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. FY 1998 ACCOMPLISHMENTS:

- (U) ($80,859) Conducted successful AH-1Z/UH-1Y airframe Critical Design Review (CDR). Started initial fabrication of AH-1Z/UH-1Y aircraft components. Continued avionics design and conducted successful avionics hardware and software Preliminary Design Reviews (PDRs).
- (U) ($431) Continued successful LFT&E of aircraft subassemblies.

2. FY 1999 PLAN:

- (U) ($115,987) Continue fabrication of AH-1Z/UH-1Y aircraft components and systems. Conduct avionics hardware and software CDRs. Begin avionics bench testing, drive train bench testing and airframe Structural Test Article (STA) testing. Deliver initial AH-1W/UH-1N aircraft to contractor for tear-down and remanufacture into EMD test aircraft. Commence assembly of EMD test aircraft.
- (U) ($1,400) Continue LFT&E effort of aircraft subassemblies and procure DT ordnance.
- (U) ($2,867) Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15 USC 638.

3. FY 2000 PLAN:

- (U) ($156,874) Complete AH-1Z/UH-1Y STA testing. Complete avionics bench testing. Continue transmission bench testing. Complete AH-1Z assembly of EMD test aircraft and conduct functional checks of installed aircraft systems.
- (U) ($809) Continue AH-1Z component fatigue and live fire testing.

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604245N** **PROJECT NUMBER: H2279/H2419**
PROGRAM ELEMENT TITLE: USMC H-1 Upgrades **PROJECT TITLE: 4BW/4BN Upgrade/UH-1 Upgrades**

(U) B. PROGRAM CHANGE SUMMARY

	FY 1998	FY 1999	FY 2000
(U) FY 1999 President's Budget:	83,774	98,542	155,587
(U) Appropriated Value:	86,335	121,942	
(U) Adjustments from President's Budget:	-2,484	+21,712	+2,096
(U) FY 2000/2001 President's Budget Submit:	81,290	120,254	157,683

CHANGE SUMMARY EXPLANATION:

Funding: FY98 decrease of -$2,201 for Small Business Innovative Research (SBIR) assessment, -$166 for contractor advisory services,-$47 for BTR Issue and -$70 FY1998 update. FY99 decrease of -$1,000 for Vector offset to N88, -$281 Revised Economic Assumption, -$14 Civilian Personnel Underexecuted, -$393 contractor advisory services, and $23,400 Congressional Add. FY00 increase of $4,437 for Crashworthy Troop Seats and GPWS integration, of which $2,196 was redirected from APN-1 (P.E. 017800), -$2,282 PBD-604, -$144 PBD-426 and $85 PBD-606.

(U) Technical: Not Applicable

(U) C. OTHER PROGRAM FUNDING SUMMARY

Appn	FY 1998 Budget	FY 1999 Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete
APN-1				784	85,340	228,584	307,418	386,017	1,922,629
Qty					5	17	24	36	198

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604245N** **PROGRAM ELEMENT TITLE: USMC H-1 Upgrades**

PROJECT NUMBER: H2279/H2419 **PROJECT TITLE: 4BW/4BN Upgrade/UH-1 Upgrades**

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

(U) D. ACQUISITION STRATEGY: The H-1 Upgrades is an ACAT ID program which encompasses Engineering and Manufacturing Development of new end-items prior to a production approval decision. The prime contract is sole source to Bell Helicopter Textron, Inc. and is a remanufacture of AH-1W and UH-1N 2-bladed rotor system platforms.

(U) E. SCHEDULE PROFILE

	FY 1998	FY 1999	FY 2000	To Complete
(U) Program Milestones				2Q/04 AH-1Z/UH-1Y MS III
(U) Engineering Milestones	2Q-4Q AH-1Y/UH-1Z CDR	1Q H/W CDR 2Q S/W CDR		
(U) T&E Milestones				2Q/02-4Q/02 UH-1Y TECHEVAL 1Q/03-3Q/03 UH-1Y OPEVAL 3Q/02-1Q/03 AH-1Z TECHEVAL 2Q/03-4Q/03 AH-1Z OPEVAL
(U) Contract Milestones				2Q/02 UH-1Y LRIP #1 2Q/03 UH-1Y LRIP #2 2Q/04 UH-1Y FRP 2Q/03 AH-1Z LRIP 2Q/04 AH-1Z FRP

EXHIBIT R-3, FY 2000 RDT&E,N COST ANALYSIS **DATE:** February 1999

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604245N** **PROJECT NUMBER: H2279/H2419** **PROJECT TITLE: 4BW/4BN**

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Major Contract	SS CPFF	Bell Helicopter Ft. Worth, TX	7,851	0	-	0	-	0	7,851	7,851
Award Fee *(See Remarks)			6,557						6,557	
Major Contract	SS CPAF	Bell Helicopter Ft. Worth, TX	123,693	97,057	10/98	140,787	10/99	138,834	503,238	516,400
GFE	Various	Various	2,992	6,130	Various	2,196	-	1,699	13,017	
In-House Support (Field Activities)	WX	Various	14,130	8,169	11/98-01/99	11,349	11/99-01/00	39,276	72,924	
In-House Support (Travel)	WX	Various	587	250	10/98	250	10/99	1,200	2,287	
Trainers	WX	Various	143	3,421	12/98	1,301	12/99	503	5,368	
Subtotal Project Development			**155,953**	**115,027**		**155,883**		**181,512**	**611,242**	

*Remarks: Total award fee $32,604,094. $6,557,023 has been awarded to date. Period #1 was 90%, period #2 was 87% and period #3 was 90%. The H-1 award fee clause has a provision that rolls unawarded fee into future periods to incentivize correction of problems and CAIV performance. No unawarded fee is released until the end of the program.

Technical Engineering Services	FFP	TBD	1,075	384	11/98	396	11/99	2,045	3,900	-
Subtotal Support			**1,075**	**384**		**396**		**2,045**	**3,900**	

Remarks

EXHIBIT R-3, FY 2000 RDT&E,N COST ANALYSIS **DATE:** February 1999

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604245N** **PROJECT NUMBER: H2279/H2419** **PROJECT TITLE: 4BW/4BN**

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Test and Evaluation		Various	981	1,400	11/98	809	11/99	4,785	7,975	-
Subtotal Test & Evaluation			**981**	**1,400**		**809**		**4,785**	**7,975**	
Remarks										
Program Office & Logistics Support	FFP	TBD	2,300	576	11/98	595	11/99	3,135	6,606	-
Subtotal Management			**2,300**	**576**		**595**		**3,135**	**6,606**	
SBIR Assessment				2,867						
Remarks										
Total Cost			**160,309**	**120,254**		**157,683**		**191,477**	**629,723**	

EXHIBIT R-2, FY 2000 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 05

PROGRAM ELEMENT: 0604261N
PROGRAM ELEMENT TITLE: Acoustic Search Sensors

(U) COST: (Dollars in Thousands)

Project Number & Title	FY 1998 Budget	FY 1999 Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete	Total Program
H0480 ASW SENSORS & PROCESSING *	11,958	29,364	25,953	20,031	24,135	21,028	17,550	23,434	CONT	CONT
H2000 AIR DEPLOYED ACTIVE RECEIVER (ADAR)	5,694	1,003	0	0	0	0	0	0	0	97,184
TOTAL	17,652	30,367	25,953	20,031	24,135	21,028	17,550	23,434	CONT	CONT

*** Note: FY 1998 budget includes $2,000 thousand Congressional add for development of alternative shallow water sound sources. FY 1999 budget includes $1,000 thousand Congressional add for advanced active processing prototype development. These funds will be executed under project H2420 (Advanced Ranging Source).**

Quantity of RDT&E Articles

H0480 — 200 Qualification Units (Q/U) AEER — 900 AEER

1 GASS — 2 GASS — 1 GASS

H2000 (N/A)

(U) A. 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 bistatic acoustic source and signal processing for harsh water environments in the P-3 Update III. In FY 2000, procure design qualification units for non-coherent source technology acceleration and initial GASS Engineering Development Model (EDM). Procure additional GASS EDMs in FY 2000. Procure AEER coherent source EDMs in FY 2004. 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.

(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.

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 05 **PROGRAM ELEMENT: 0604261N** **PROJECT NUMBER: H0480**
PROGRAM ELEMENT TITLE: Acoustic Search Sensors **PROJECT TITLE: ASW Sensors & Processing**

(U) COST: (Dollars in Thousands)

Project Number & Title	FY 1998 Budget	FY 1999 Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete	Total Program
H0480 ASW Sensors & Processing *	11,958	29,364	25,953	20,031	24,135	21,028	17,550	23,434	CONT	CONT
TOTAL	11,958	29,364	25,953	20,031	24,135	21,028	17,550	23,434	CONT	CONT

*** Note: FY 1998 budget includes $2,000 thousand Congressional add for development of alternative shallow water sound sources. FY 1999 budget includes $1,000 thousand Congressional add for advanced active processing prototype development. These funds will be executed under project H2420 (Advanced Ranging Source).**

Quantity of RDT&E Articles		200 Qualification Units (Q/U) AEER		900 AEER
	1 GASS	2 GASS	1 GASS	

(U) A. 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 in the P-3 Update III. In FY 2000, procure design qualification units for non-coherent source technology acceleration and initial GASS Engineering Development Model (EDM). Procure additional GASS EDMs in FY 2000. Procure AEER coherent source EDMs in FY 2004. 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. FY 1998 ACCOMPLISHMENTS:
(U) GASS

- (U) ($4,208) EMD contractor completed GASS system design review and software system architecture.
- (U) ($ 250) Continued GFE environmental software development to reduce EMD risk.

- (U) ($ 768) Provided engineering oversight of EMD contractor.
- (U) ($ 543) Provided other engineering support and contractor support services.

(U) AEER
- (U) ($ 100) Completed the AEER Analysis of Alternatives (AOA).
- (U) ($2,565) Initiated implementation of AEER baseline software in P-3C Update III.
- (U) ($1,422) Initiated systems requirements for implementation of AEER in P-3C Update III.
- (U) ($ 521) Provided other engineering support and contract support services.
- (U) ($1,581) Initiated performance specification to support acceleration of non-coherent source technology enhancements.

2. FY 1999 PLAN:
(U) GASS
- (U) ($10,160) EMD contractor complete GASS system Preliminary Design Review (PDR) and the design for the major Computer Software Configuration Items (CSCI); initiate procurement of pre-production hardware.
- (U) ($ 310) Continue GFE environmental software improvements.
- (U) ($ 707) Provide engineering oversight of EMD contractor.
- (U) ($ 1,252) Provide other engineering support and contractor support services.
- (U) ($ 503) Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15 USC 638.

(U) AEER

- (U) ($2,418) Continue AEER coherent source system design trade-offs and system analysis.
- (U) ($5,389) Initiate/complete Critical Design Review (CDR) and continue software code and test for AEER baseline in the P-3C Update III.
- (U) ($5,357) Complete PDR and award Engineering Change Proposal (ECP) qualification contract for fabrication and test of design qualification of units for acceleration of non-coherent source technology enhancements.
- (U) ($2,294) Provide other engineering support and contractor support services.
- (U) ($ 974) Procure Commercial Off The Shelf (COTS) hardware and software development tools and develop active acoustic processing prototype.

3. FY 2000 PLAN:

(U) GASS

- (U) ($15,200) EMD contractor complete GASS system CDR and initiate code and test for the major CSCIs, complete PDR for GASS Interface Module (GIM) #1 & #2, CDR for GIM #1 and initiate GIM code and test, initiate/complete procurement of pre-production hardware,and initiate/complete fabrication of GASS units #1 and #2.
- (U) ($ 335) Continue GFE environmental software improvements.
- (U) ($ 710) Provide engineering oversight to EMD contractor.
- (U) ($ 1,883) Provide other engineering support and contract support services.

(U) AEER

- (U) ($1,787) Complete software code and test for AEER baseline in the P-3C Update III.
- (U) ($4,250) Complete CDR and fabrication and test of ECP qualification units for non-coherent source technology enhancements.
- (U) ($1,788) Provide other engineering support and contract support services.

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 05 **PROGRAM ELEMENT: 0604261N** **PROJECT NUMBER: H0480**
PROGRAM ELEMENT TITLE: Acoustic Search Sensors **PROJECT TITLE: ASW Sensors & Processing**

(U) B. PROGRAM CHANGE SUMMARY

	FY 1998	FY 1999	FY 2000
(U) FY 1999 President's Budget:	12,450	28,630	37,358
(U) Appropriated Value:	12,869	28,630	
(U) Adjustments from 1999 Pres Budget:	-492	+734	-11,405
(U) FY 2000/2001 Pres Budget Submit:	11,958	29,364	25,953

CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1998 net decrease of -$492 thousand reflects -$223 thousand for an SBIR reduction and Below Threshold Reprogrammings (BTR's) of -$269 thousand. FY 1999 net increase of +$734 thousand includes a +$1,000 thousand Congressional plus-up, -$68 thousand for revised economic assumptions, -$24 thousand for minor program adjustments, and a -$174 thousand Contract Advisory adjustment. FY2000 net decrease of -$11,405 thousand reflects -$68 thousand for minor program adjustments, -$11,000 thousand for a program restructuring adjustment which delays AEER MS II by one year, a Navy Working Capital Fund (NWCF) rate adjustment of +$24 thousand, +$21 thousand for Civilian pay rate adjustments (PBD 606), -$375 thousand for Non Pay Inflation (PBD 604), and -$7 thousand for NWCF rate adjustments (PBD 426).

(U) Schedule: AEER Baseline CDR delayed from 1Q/99 to 3Q/99 to allow for further software maturity. AEER MS-II delayed from 4Q/00 to 4Q/01 and EMD contract award from 1Q/01 to 1Q/02 due to program funding restructure in FY 00/01. AEER SDR, PDR, CDR, TECHEVAL and OPEVAL have subsequently been delayed from 3Q/01 to 3Q/02 (SDR), 3Q/03 to 3Q/04 (PDR), 3Q/04 to 3Q/05 (CDR),1Q/05-2Q/05 to 1Q/06-2Q/06 (TECHEVAL) and 3Q/05-4Q/05 to 3Q/06-4Q/06 (OPEVAL). The start of SWALAS EMD is delayed to beyond the FYDP due to funding restructure. Also, 1Q GASS PDR #1 is now correctly displayed in FY 2000 vice FY 1999 as shown in a previous submission.

(U) Technical: Not applicable.

(U) C. OTHER PROGRAM FUNDING SUMMARY

Appn	FY 1998 Budget	FY 1999 Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete
(U) APN/P-3 Mod/(053800)	0	0	0	400	2,800	6,500	10,800	11,200	CONT

(U) Related RDT&E
(U) P.E. 0603254N (ASW Systems Development)

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 05 **PROGRAM ELEMENT: 0604261N** **PROJECT NUMBER: H0480**
PROGRAM ELEMENT TITLE: Acoustic Search Sensors **PROJECT TITLE: ASW Sensors & Processing**

(U) D. ACQUISITION STRATEGY: The GASS EMD contract was competitively awarded. Program development is based on a COTS open architecture hardware and software approach. AEER EMD will use a competitive contracting strategy. Supporting efforts utilize Qualified Product List (QPL) manufacturers and existing contracting vehicles where appropriate for development efficiency.

(U) E. SCHEDULE PROFILE

	FY 1998	FY 1999	FY 2000	TO COMPLETE
(U) Program Milestones				4Q/01 AEER MS-II 3Q/02 GASS MS-III
(U) Engineering Milestones		3Q AEER BASELINE CDR 1Q Q/U PDR	1Q Q/U CDR 1Q GASS PDR #1 3Q GASS CDR #1 4Q GASS PDR #2	2Q/01 GASS PDR#3/CDR#2 3Q/01 GASS PDR#4 4Q/01 GASS CDR#3 3Q/02 AEER SDR 1Q/02 GASS CDR #4 3Q/04 AEER PDR 3Q/05 AEER CDR
(U) T&E Milestones				3Q/01 Q/U DT 4Q/01 Q/U OT 1Q/02-2Q/03 GASS TTPRR 1Q/06-2Q/06 AEER TECHEVAL 3Q/06-4Q/06 AEER OPEVAL
(U) Contract Milestones		2Q Qual Units Contract Award		1Q/02 AEER EMD Contract Award

EXHIBIT R-3, FY 2000 RDT&E,N COST ANALYSIS DATE: February 1999

BUDGET ACTIVITY: 05 PROGRAM ELEMENT: 0604261N PROJECT NUMBER: H0480
PROJECT TITLE: ASW SENSORS & PROC

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Hardware Development	TBD	TBD	0	3,000	3/99	3,000	3/00	0	TBD	TBD
	C/CPFF	Misc Contracts	1,000	250	3/99	0		0	1,250	1,250
Software Development	C/CPIF	Northrop Grumman, NY	5,208	10,160	12/98	15,200	12/99	15,592	46,160	46,160
	C/CPFF	Misc GASS Con	11,417	435	11/98	460	11/99	507	12,819	12,819
	C/CPFF	Misc/P-3 Baseline Cont's	2,000	3,000	11/98	800	11/99	0	5,800	5,800
	WX	Misc In-House	0	724	3/99	0		0	724	724
Gov't & Engineering Support	WX	Misc In-House	18,378	7,223	10/98	2,515	10/99	Cont.	Cont.	Cont.
Award Fees			0	0		0		0	0	0
Subtotal Project Development			**38,003**	**24,792**		**21,975**		**Cont,**	**Cont.**	**Cont.**
Remarks										
Program Management Support	WX	Misc In-House	2,135	2,344	10/98	2,632	10/99	Cont.	Cont.	Cont.
Subtotal Support			**2,135**	**2,344**		**2,632**		**Cont.**	**Cont.**	**Cont.**
Remarks										

EXHIBIT R-3, FY 2000 RDT&E,N COST ANALYSIS DATE: February 1999

BUDGET ACTIVITY: 05 PROGRAM ELEMENT: 0604261N PROJECT NUMBER: H0480
PROJECT TITLE: ASW SENSORS & PROC

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Development Test	WX	Misc In-House	0	1,137	10/98	307	10/99	Cont.	Cont.	Cont.
Subtotal Test & Evaluation			**0**	**1,137**		**307**		**Cont.**	**Cont.**	**Cont.**
Remarks										
Contractor Support Services	C/CPFF	Misc/Contracts	3,986	588	10/98	1,039	10/99	Cont.	Cont.	Cont.
Subtotal Management			**3,986**	**588**		**1,039**		**Cont.**	**Cont.**	**Cont.**
SBIR Assessment				503						
Remarks										
Total Cost			**44,124**	**29,364**		**25,953**		**Cont.**	**Cont.**	**Cont.**

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 05 PROGRAM ELEMENT: 0604261N PROGRAM ELEMENT TITLE: Acoustic Search Sensors

PROJECT NUMBER: H2000 PROJECT TITLE: Air Deployed Active Receiver

(U) COST: (Dollars in Thousands)

Project Number & Title	FY 1998 Budget	FY 1999 Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete	Total Program
H2000 Air Deployed Active Receiver (ADAR)	5,694	1,003	0	0	0	0	0	0	0	97,184
TOTAL	5,694	1,003	0	0	0	0	0	0	0	97,184
Quantity of RDT&E Articles	0	0								

(U) A. 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.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. FY 1998 ACCOMPLISHMENTS:

- (U) ($ 654) Provided EMD contractor corrective action for Lot Acceptance Test deficiencies.
- (U) ($1,640) Provided engineering support for completion of TECHEVAL
- (U) ($1,514) Completed TECHEVAL.

- (U) ($ 740) Completed OPEVAL.
- (U) ($ 347) Initiated Generic Acoustic Stimulator System (GASS) prototype integration into S-3B Weapon System Trainer (WST) for Fleet Introduction Team (FIT) training.
- (U) ($ 153) Completed FIT training materials.
- (U) ($ 646) Provided other engineering support and contractor support services.

2. FY 1999 PLAN:

- (U) ($ 713) Provide engineering support and analysis for Milestone III decision process.
- (U) ($ 285) Provide other engineering support and contractor support services.
- (U) ($ 5) Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15 USC 638.

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 1999

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

(U) B. PROGRAM CHANGE SUMMARY

	FY 1998	FY 1999	FY 2000
(U) FY 1999 President's Budget:	5,865	1,007	
(U) Appropriated Value:	5,865	1,007	
(U) Adjustments from 1999 Pres Budget:	-171	-4	
(U) FY 2000/2001 Pres Budget Submit:	5,694	1,003	

CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1998 net decrease of -$171 thousand reflects -$96 thousand SBIR reduction and -$75 thousand for program adjustments. FY 1999 net decrease of -$4 thousand reflects -$2 thousand for Revised Economic Assumptions, and -$2 thousand for a minor program adjustment.

(U) Schedule: TECHEVAL completion delayed from 3Q/98 to 4Q/98 to allow adequate software maturity. OPEVAL and Milestone III completion delayed (4Q/98 to 1Q/99) and (1Q/99 to 2Q/99) respectively due to TECHEVAL slip.

(U) Technical: Not applicable.

(U) C. OTHER PROGRAM FUNDING SUMMARY

Appn	FY 1998 Budget	FY 1999 Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete
(U) OPN (SSQ-101) (403600)	0	16,482	12,773	10,803	13,871	11,093	13,788	14,570	CONT

(U) Related RDT&E

(U) P.E. 0603254N (ASW Systems Development)

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 1999

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

(U) D. ACQUISITION STRATEGY: ADAR EMD contract was competitively awarded to include first year production option.

(U) E. SCHEDULE PROFILE

	FY 1998	FY 1999	FY 2000	TO COMPLETE
(U) Program Milestones		2Q MS-III		
(U) Engineering Milestones				
(U) T&E Milestones	1Q-4Q TECHEVAL	1Q-1Q OPEVAL		
(U) Contract Milestones				

EXHIBIT R-3, FY 2000 RDT&E,N COST ANALYSIS DATE: February 1999

BUDGET ACTIVITY: 05 PROGRAM ELEMENT: 0604261N PROJECT NUMBER: H2000
PROJECT TITLE: AIR DEPLOYED ACTIVE REC

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Hardware Development	C/CPFF	Erapsco, Ft Wayne, IN	25,630	0		0		0	25,630	25,630
Gov't Engineering Support	WX	NAWCAD, PAX	46,090	713	11/98	0		0	46,803	46,803
	WX	Misc In-House	9,610	0		0		0	9,610	9,610
Trainer Integration	C/CPFF	Misc Contracts	347	0		0		0	347	347
Award Fees			0	0		0		0	0	0
Subtotal Project Development			**81,677**	**713**		**0**		**0**	**82,390**	**82,390**

Remarks

Program Management	WX	Misc In-House	4,657	210	11/98	0		0	4,867	4,867
Subtotal Support			**4,657**	**210**		**0**		**0**	**4,867**	**4,867**

Remarks

EXHIBIT R-3, FY 2000 RDT&E,N COST ANALYSIS DATE: February 1999

BUDGET ACTIVITY: 05 PROGRAM ELEMENT: 0604261N H2000
Air Deployed Active Receiver

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Development Test	WX	Misc In-House	4,378	0		0		0	4,378	4,378
Gov't Furnished Property	WX	NAWCAD WAR	2,296	0		0		0	2,296	2,296
Operational Test	WX	VX-1 PAX	740	0		0		0	740	740
Subtotal Test & Evaluation			**7,414**	**0**		**0**		**0**	**7,414**	**7,414**
Remarks										
Contractor Support Services	C/CPFF	Misc Contracts	2,433	75	11/98	0		0	2,508	2,508
Subtotal Management			**2,433**	**75**		**0**		**0**	**2,508**	**2,508**
SBIR Assessment				5					5	5
Remarks										
Total Cost			**96,181**	**1,003**		**0**		**0**	**97,184**	**97,184**

EXHIBIT R-2, FY 2000 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5

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

(U) COST: (Dollars in Thousands)

Project Number & Title	FY 1998 Budget	FY 1999 Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete	Total Program
H1425 V-22	487,649	345,782	182,885	151,275	98,713	43,341	19,627	10,423	0	6,929,105
TOTAL	487,649	345,782	182,885	151,275	98,713	43,341	19,627	10,423	0	6,929,105
RDT&E Articles										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. The four RDT & E test aircraft are production representative.

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 1999

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

(U) COST: (Dollars in Thousands)

Project Number & Title	FY 1998 Budget	FY 1999 Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete	Total Program
H1425 V-22	487,649	345,782	182,885	151,275	98,713	43,341	19,627	10,423	0	6,929,105
TOTAL	487,649	345,782	182,885	151,275	98,713	43,341	19,627	10,423	0	6,929,105
RDT&E Articles										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. The four RDT & E test aircraft are production representative.

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 1998 ACCOMPLISHMENTS:
   - (U) ($432,577) Continued MV-22 and CV-22 contract efforts related to the EMD program including efforts at Raytheon (formerly NAWC, Indianapolis). Continued Fatigue Test Articles (FTA) efforts. Continued LSA and training efforts. Completed Depot level LSA. Started drop test article (DTA) testing. Partially funded the EMD aircraft contract overrun.
   - (U) ($55,072) Continued in-house flight test activities, Integrated Test Teams (ITTs), Integrated Product Teams (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. Completed CV-22 PDR. Started operational test assessment (OT-IID).

2. (U) FY 1999 PLAN:
   - (U) ($283,771) Continue MV-22 and CV-22 contract development efforts, including flight test, GFE integration, logistics efforts, Power By The Hour (PBTH) support of the engine, support equipment procurements, repair of repairables, and other EMD efforts. Continue training efforts including development of the Naval Air Maintenance Trainer Suite (NAMTS). Begin CV-22 modifications for the flight simulator and NAMTS. Completed DTA testing. Continue FTA efforts. Start STA test to failure. Send two EMD aircraft to Bell, Ft. Worth; one for incorporation of CV-22 modifications, and one for remanufacture of a full up CV-22 aircraft. Continue CV-22 software development efforts. Begin Weapons Replaceable Assembly/Test Program Sets (WRA/TPS) development. Partially fund the EMD aircraft contract overrun. Completed CV-22 Critical Design Review (CDR).
   - (U) ($54,746) Continue in-house flight test activities, support of ITTs and IPTs, logistics and training activities, MV-22 and CV-22 site activation planning, the manned flight simulator and numerous other development and test efforts at government in-house activities. Completed OT-IID. Conduct flight test supportablility assessment. Conduct EW systems integration efforts, sea trials, planning for CV-22 flight test, and planning for MV-22 OPEVAL. Completed CV-22 CDR.
   - (U) ($7,265) Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15 USC 638.

3. (U) FY 2000 PLAN:
   - (U) ($137,412) Continue CV-22 remanufacture and modification efforts. Continue CV-22 software development efforts. Begin TF/TA radar development testing for the CV-22. Complete MV-22 OPEVAL. Continue NAMTS and CV-22 training development efforts. Continue CV-22 peculiar ILS supportability analysis, publications, and spares support. Continue WRA/TPS development. Continue FTA efforts. Continue PBTH support of the engine. Conduct natural icing tests. Complete STA test to failure.

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

- (U) ($45,473) Continue in-house activity's support of ITTs and IPTs, logistics and training activities, the manned flight simulator and numerous other efforts performed at over 12 activities. Participate in CV-22 radar and development testing. Participate in natural icing test. Conduct MV-22 OPEVAL and support. Continue CV-22 peculiar logistic support analysis and site activation planning.

(U) B. PROGRAM CHANGE SUMMARY

	FY 1998	FY 1999	FY 2000
(U) FY 1999 President's Budget:	512,139	355,142	186,838
(U) Appropriated Value:	487,200	355,142	
(U) Adjust. from 1999 President's Budget:	-24,490	-9,360	-3,953
(U) FY 2000/2001 President's Budget:	487,649	345,782	182,885

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

CHANGE SUMMARY EXPLANATION:

- (U) Funding: The $24,490 thousand decrease in FY 98 reflects adjustments for SBIR ($-13,401K), Federal Technology transfer ($-13K), and below threshold reprogrammings ($-11,076K). The $9,360 thousand decrease in FY 99 reflects Congressional reductions for inflation, contract and advisory assistance services, etc. ($-7,360K), and below threshold reprogrammings ($-2,000K). The FY 00 reduction of $3,953 thousand reflects various adjustments for inflation, pay rates etc..
- (U) Schedule: The CV-22 PDR completed earlier, 1Q98 vice 2Q98. The operational assessment (OT-IID) started in 4Q98 vice 3Q98 as a result of flight test program delays. TECHEVAL integrated into development test effort; there will not be a dedicated TECHEVAL period.
- (U)Technical: Not applicable.

(U) C. OTHER PROGRAM FUNDING SUMMARY

APPN	FY 1998 BUDGET	FY 1999 BUDGET	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	TO COMPLETE
APN V-22	616,615	607,861	796,392	1,096,891	1,198,277	1,549,705	1,560,390	1,537,154	12,297,856
ADV PROCUREMENT	59,971	53,862	71,044	80,531	168,977	228,657	180,537	153,367	792,054
APN SPARES	21,397	30,365	68,910	132,846	183,764	55,326	54,739	52,108	339,398
TOTAL APN	**697,983**	**692,088**	**936,346**	**1,310,268**	**1,551,018**	**1,833,688**	**1,795,666**	**1,742,629**	**13,429,308**

Related RDT&E

(U) PE 116404BB CV-22

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

(U) D. 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.

(U) E. SCHEDULE PROFILE

	FY 1998	FY 1999	FY 2000	To Complete
(U) Program Milestones				1Q01 MSIII(FRP) 2Q01 MV-22 IOC
(U) Engineering Milestones	1Q98 CV PDR	1Q99 CV CDR		
(U) T&E Milestones	4Q98-1Q99 OT-IID	2Q99 SEA TRIALS	1Q00-3Q00 OPEVAL 1Q00 START CV-22 FLIGHT TEST	
(U) Contract Milestones				

EXHIBIT R-3, FY 2000 RDT&E,N COST ANALYSIS

DATE: February 1999

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604262N

PROJECT NUMBER: H1425

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	Cost to Complete	Total Cost	Target Value of Contract
PRODUCT DEVELOPMENT										
	CPAF	Bell-Boeing, Arlington, VA	3,170,526	251,093	OCTOBER	115,873	OCTOBER	212,280	3,749,772	3,409,521
AWARD FEE		Bell-Boeing	125,319	31,952		12,876		9,872	180,019	
	CPIF	Allison Indianapolis, IN	169,368	4,409	OCTOBER	1,334	OCTOBER	CONT	CONT	
	T & M	STI Rockville, MD	17,914	1,867	OCTOBER	1,264	OCTOBER	CONT	CONT	
	T & M	VSS Alexandria, VA	4,651	493	OCTOBER	518	OCTOBER	CONT	CONT	
	CPIF	Hughes Indianapolis, IN	5,337	3,151	OCTOBER	0	OCTOBER	CONT	CONT	
	WX	NAWCADPAX*		55,765	OCTOBER	47,679	OCTOBER	CONT	CONT	
	WX	NAD CH PT		9,279	OCTOBER	8,561	OCTOBER	CONT	CONT	
	WX	NAWCADLKE		5,574	OCTOBER	3,720	OCTOBER	CONT	CONT	
	WX	NAWCWDCHL		1,181	OCTOBER	721	OCTOBER	CONT	CONT	
	WX	NATSF		1,526	OCTOBER	161	OCTOBER	CONT	CONT	
	Various	MISC Gov't		4,179	OCTOBER	3,054	OCTOBER	CONT	CONT	
Subtotal Product Development			**6,073,966**	**338,517**		**182,885**		**0**	**0**	

Remarks:
AWARD FEE IS A NON-ADDITIVE NUMBER. Fees actually awarded range from 67% to 86%. Target value of Bell-Boeing contract doesn't include anticipated overrun, ACO orders, or new efforts not already on contract (FY 99-05). Prior year costs are not available for In-House activities.
*Includes former NAWC Indianapolis efforts now privatized and contracted with Raytheon.

SUPPORT

Subtotal Support	**0**	**0**	**0**	**0**	**0**	**0**	

EXHIBIT R-3, FY 2000 RDT&E,N COST ANALYSIS

DATE: February 1999

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604262N

PROJECT NUMBER: H1425
PROJECT TITLE: V-22

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Test and Evaluation										
Subtotal Test & Evaluation			0	0		0		0	0	
Remarks:										
Management										
Subtotal Management			3,093	0		0		0	3,093	
Remarks: ASN directed studies										
SBIR Assessment				7,265						
Total Cost			6,077,059	345,782		182,885		323,379	6,929,105	

EXHIBIT R-2, FY 2000 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: FEBRUARY 1999

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604264N
PROGRAM ELEMENT TITLE: Aircrew Systems Development

(U) COST: (Dollars in Thousands)

Project Number & Title	FY 1998 Budget	FY 1999 Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete	Total Program
W0606 Aircrew Systems Development	16,985	11,322	6,801	11,198	9,138	9,376	9,625	9,854	CONT.	CONT.
TOTAL	16,985*	11,322**	6,801	11,198	9,138	9,376	9,625	9,854	CONT.	CONT.

*FY98 Budget reflects a $5,697K Congressional Add for NACES II Ejection Seat Product Improvement effort executed under Project Unit Number W2421.
**FY99 Budget reflects a $2,500K Congressional Add for AV-8B Escape Improvement effort executed under Project Unit W2421.

(U) A. 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 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, which expedite introduction of new products into Navy and Marine Corps fixed and rotary wing aircraft, reduce costs, and promote commonality.

(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.

DATE: FEBRUARY 1999

BUDGET ACTIVITY: 5 | **PROGRAM ELEMENT: 0604264N** | **PROGRAM ELEMENT TITLE: Aircrew Systems Development** | **PROJECT NUMBER: W0606** | **PROJECT TITLE: Aircrew Systems Development**

(U) COST: (Dollars in Thousands)

Project Number & Title	FY 1998 Budget	FY 1999 Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete	Total Program
W0606 Aircrew Systems Development	16,985	11,322	6,801	11,198	9,138	9,376	9,625	9,854	CONT.	CONT.
TOTAL	16,985*	11,322**	6,801	11,198	9,138	9,376	9,625	9,854	CONT.	CONT.

*FY98 Budget reflects a $5,697K Congressional Add for NACES II Ejection Seat Product Improvement effort executed under Project Unit Number W2421.
**FY99 Budget reflects a $2,500K Congressional Add for AV-8B Escape Improvement effort executed under Project Unit W2421.

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:
(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 Cockpit Air Bag System (JCABS), Crashworthy Troop Seats (CWTS), and Non-NACES and Small Occupant Escape System Improvements.
- (U) **LIFE SUPPORT/THREAT PROTECTION**: Extreme Cold Weather Improvement Program (ECWIP), Aircrew Modified Equipment Leading to Increased Accommodation (AMELIA), PRC-112P3I, Aircrew Accommodation Expansion Program (AAEP), Advanced Oxygen Delivery System (AODS), Advanced Oxygen Mask (AOM), Aircrew Cooling, and Advanced Integrated Life Support Systems (AILSS).
- (U) **HELMET, VISION AND DISPLAYS**: Joint Night Vision Systems (JNVS), Joint Helmet Mounted Cueing System (JHMCS), Navy Day/Night All Weather Helmet (NDNAWH), Joint Service Advanced Laser Eye Protection Visor (JALEPV) Program, Laser Eye Protection Improvement Program (LEPIP) EDU-5/P Spectacles, and Agile Frequency Laser Eye Protection.

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:

1. FY 1998 ACCOMPLISHMENTS:

(U) (10,052) NACESP3I: Completed Phase I CDR and initiated System DT. Started ECP preparation. Contract awarded for Phase II and started technology trade-off and integration studies. Non-NACES and Small Occupant Escape System Improvements: Conducted technology trade-off studies, conducted simulations and analysis on selected alternatives and prepared program plan for integration efforts. ACASS: Completed preliminary testing on MA-16 inertia reel and submitted to a/c platforms for successful incorporation. JCABS: Completed Joint Army/Navy integration design. CWTS: Contract awarded and successfully completed contract award protest for troop seats.

(U) (1,745) ECWIP: Continued DT/OT for cold weather clothing and survival items and prepared ECP's. AMELIA: Continued DT and OT of modified equipment and began ECP preparation. AAEP: Continued cockpit mappings. AILSS: Monitored Army EMD for rotary wing system. Aircrew Cooling: Initiated DT studies.

(U) (5,188) NVS: Monitored USAF panoramic NVG program and NVS Detachment system. JHMCS: Continued platform integration and software development. Finalized Critical Design Review (CDR)/commenced DT. NDNAWH: Developed test procedures. LEPIP EDU-5/P Spectacles: Completed DT and commenced OT. JALEPV: Held PDR and commenced DT. Delivered 55 T&E visors. Commenced compatibility, environmental and laser saturation testing. Prepared ECP.

2. FY 1999 PLAN:

(U) (5,378) NACESP3I: Conduct system qualification testing and aircraft integration efforts, and approve ECP's. Conduct Phase II technology trade-off and integration studies and conduct demonstration/DT testing on selected candidate technologies. CWTS: Complete DT and prepare H-1 platform ECP's. Continue DT H-3 & H-46.

(U) (411) ECWIP: Continue DT/OT 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 make recommendations to platforms.

(U) (5,375) NVS: Monitor and participate in JNVS testing, product improvements. JHMCS: Complete platform integration and software development, DT/OT evaluators. JALEPV: Deliver pre-production visors, MSIII, start production, commence agile frequency protection studies. LEPIP EDU-5/P Spectacles: Complete OT.

(U) (158) Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15 USC 638.

3. FY 2000 PLAN:

(U) (1,486) NACES P3I: Finalize testing and approve audit for a/c platform installation. Conduct DT/OT testing and physical configuration audit on selected candidate technologies. CWTS: Complete H-1(4BN) FSD a/c installation and a/c OT. Commence preparation of H-3/H-46 platform ECP's. Non-NACES and Small Occupant Escape System improvements: Conduct DT/OT on selected subsystems.

(U) (2,200) ECWIP: Complete DT/OT for cold weather clothing and survival items and prepare ECP's. AMELIA: Continue DT and OT of modified equipment and prepare ECP's. Aircrew Cooling: Recommence DT studies.

(U) (3,115) NVS: Monitor and participate in JNVS testing and product improvements. JHMCS: MSIII. NDNAWH: MSII.

DATE: FEBRUARY 1999

BUDGET ACTIVITY: 5 | **PROGRAM ELEMENT: 0604264N** | **PROGRAM ELEMENT TITLE: Aircrew Systems Development** | **PROJECT NUMBER: W0606** | **PROJECT TITLE: Aircrew Systems Development**

(U) B. PROGRAM CHANGE SUMMARY

	FY 1998	FY 1999	FY 2000
(U) FY 1999 President's Budget:	17,366	9,454	9,246
(U) Appropriated Value:	17,366	11,954	
(U) Adjustments from President's Budget:	-381	+1,868	-2,445
(U) FY 2000 President's Budget Submit:	16,985	11,322	6,801

CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1998 decrease reflects -$251 thousand for Small Business Innovation Research (SBIR) assessment and -$130 thousand for higher Navy priorities. FY 1999 increase reflects +$2,500 thousand for AV-8B Escape Improvement effort, -$590 thousand for Contract Advisory and Assistance Support, -$28 thousand for revised economic assumptions and -$14 thousand for minor program adjustments. FY 2000 decrease reflects a -$2,327 thousand reduction for program delays in FY-97, -$18 thousand for minor program adjustments, -$47 thousand for NWCF rate adjustments, and -$53 thousand for inflation reductions.

(U) Schedule: FY 98 - 4Q CWTS H-1, H-3 & H-46 Engineering Milestone slipped from 3Q due to a contract award protest. 3Q CWTS H-1, H-3 & H-46 Contract Award slipped from 2Q. Contract awarded Feb 98 to Skyline Industries, Inc. East-West Manufacturing, a competitive company, protested. GAO resolution has been ongoing and finalized now (3Q). 2Q PNR EMD Contract Award has been removed due to funding being shifted to higher priority efforts, JHMCS and NVS.
FY 99 - 3Q JHMCS OT T&E Milestone changed from 4Q due to program acceleration. 4Q AODS DT T&E Milestone has been removed due to funding being shifted to higher priority efforts, JALEPV, JHMCS, etc.
FY 00 – Panoramic NVG MSI has been removed because this effort will be encompassed within the Navy's Day/Night Helmet.

(U) Technical: N/A

DATE: FEBRUARY 1999

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604264N** **PROJECT NUMBER: W0606**
PROGRAM ELEMENT TITLE: Aircrew Systems Development **PROJECT TITLE: Aircrew Systems Development**

(U) C. OTHER PROGRAM FUNDING SUMMARY

Appn	FY 1998 Budget	FY 1999 Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete
AVIATION LIFE SUPPORT-OPN	**11,265**	**16,545**	**17,053**	**16,522**	**28,784**	**29,187**	**29,909**	**30,519**	**CONT.**

Related RDT&E

(U) P.E. 0603216N (Aviation Survivability), P.E. 0604706F (Life Support Equipment, related Air Force efforts), P.E. 0604713A (Combat Feeding, Clothing and Equipment, related Army efforts. Coordinated through the OSD sponsored Tri-Service Life Support RDT&E Steering Committee), P.E. 0604384BP (Chemical Biological (CB) program), P.E. 06084201F (Common Avionics related Air Force efforts).

(U) D. ACQUISITION STRATEGY: COTS/NDI where possible, cost plus award fee contracts, CAIV. Majority of programs non-ACAT programs with no specific acquisition strategies.

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604264N** **PROGRAM ELEMENT TITLE: Aircrew Systems Development** **PROJECT NUMBER: W0606** **PROJECT TITLE: Aircrew Systems Development**

(U) E. SCHEDULE PROFILE

	FY 1998	FY 1999	FY 2000	To Complete
(U) Program Milestones	4Q JCABS SH-60 ECP	2Q AOM MSII 3Q AODS MSII 3Q JALEPV MSIII 3Q LEPIP MSIII NACES P3I ECP	JHMCS MSIII NDNAWH MSII	CWTS H-3, & H-46 ECP NON-NACES ECP NACES P3I ECP'S
(U) Engineering Milestones	2Q LEPIP PDR 2Q JALEPV PDR 3Q NACES P3I CDR 4Q CWTS H-1, H-3, & H-46 4Q JHMCS CDR	2Q JALEPV ECP		
(U) T&E Milestones	1Q NDNAWH DT 3Q LEPIP DT COMP. 3Q CWTS H-1, H-3, & H-46 DT 3Q JHMCS DT 4Q LEPIP OA COMP.	1Q JALEPV OA 3Q AOM DT NACES P3I DT 3Q JHMCS OT 1Q NACES P3I DT/OT 3Q CWTS H-1, H-3, & H-46 DT	NACES P3I DT 3Q COOLING DT JHMCS P3I NDNAWH MSII	NACES P3I DT/OT NDNAWH DT
(U) Contract Milestones	3Q CWTS H-1, H-3,& H-46 AWARD 3Q NACES P3I AWARD 4Q JALEPV DT COMP.			

EXHIBIT R-3, FY 2000 RDT&E,N COST ANALYSIS

DATE: FEBRUARY 1999

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604264N

PROJECT NUMBER: W0606

PROJECT TITLE: Aircrew Systems Development

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Systems Engineering (Misc. less $1M)	WX/RX	NAWC	21669	1919	Various	2340	Various	CONT.	CONT.	
JHMCS Hardware Development	MIPR	WPAFB	3500	2350	JAN 99	500	JAN 00		6350	6350
Subtotal Product Development			**25169**	**4269**		**2840**		**CONT.**	**CONT.**	

Remarks:

ILS (Misc. less $1M)	WX/RX	NAWC	13583	1028	Various	795	Various	CONT.	CONT.	
Subtotal Support			**13583**	**1028**		**795**		**CONT.**	**CONT.**	

Remarks:

EXHIBIT R-3, FY 2000 RDT&E,N COST ANALYSIS

DATE: FEBRUARY 1999

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604264N

PROJECT NUMBER: W0606

PROJECT TITLE: Aircrew Systems Development

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Developmental T&E (Misc. less $1M)	WX/RX	NAWC	27342	4667	Various	1946	Various	CONT.	CONT.	
Operational T&E (Misc. less $1M)	WX/RX	NAWC	3037	521	Various	495	Various	CONT.	CONT.	
Subtotal Test & Evaluation			**30379**	**5188**		**2441**		**CONT.**	**CONT.**	
Remarks:										
MISC (LESS THAN $1M)	WX/RX	NAWC	4550	679	Various	725	Various	CONT.	CONT.	
Subtotal Management			**4550**	**679**		**725**		**CONT.**	**CONT.**	
Remarks:										
SBIR Assessment				**158**						
Total Cost			**73681**	**11322**		**6801**		**CONT.**	**CONT.**	

EXHIBIT R-2, FY 2000 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604270N
PROGRAM ELEMENT TITLE: Electronic Warfare Development

(U) COST: (Dollars in Thousands)

Project Number & Title	FY 1998 Budget	FY 1999 Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Complete	To Program	Total
E0556 EW Counter Response	5,278	64,964	87,319	48,574	25,383	22,951	34,844	44,694	CONT.	CONT.
E2175 Tactical Air Electronic Warfare	86,487	67,396*	73,051	32,288	7,784		0	0	0	495,844
R2260 Specific Emitter Identification	1,376	1,688	1,811	1,813	1,869	1,927	1,982	2,039	CONT.	CONT.
Z1742 EW Technical Development and Testing	656	825	896	922	949	975	1,001	1,026	CONT.	CONT.
TOTAL	$93,797	$134,873	$163,077	$83,597	$35,985	$25,853	$37,827	$47,759	CONT.	CONT.
Quantity of RDT&E Articles	481	461	8	3	0	0	0	0		

* Includes $9.3 M Congressional transfer being executed for IDECM under E2635.

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This element includes development of electronic warfare systems for the United States Navy (USN), United States Marine Corps (USMC), and United States Army (USA) tactical aircraft, USMC helicopters, surface combatants, data link vulnerability assessments, precision targeting , USMC communications and non-communications jammers , and development and testing of electronic warfare devices for emergency contingencies.

(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 full rate production approval decision.

DATE: February 1999

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604270N
PROGRAM ELEMENT TITLE: Electronic Warfare Development

PROJECT NUMBER: E0556
PROJECT TITLE: EW Counter Response

(U) COST: (Dollars in Thousands)

Project Number & Title	FY 1998 Budget	FY 1999 Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Complete	To Program	Total
E0556 EW Counter Response	5,278	64,964	87,319	48,574	25,383	22,951	34,844	44,694	CONT	CONT
TOTAL	*5,278	64,964	87,319	48,574	25,383	22,951	34,844	44,694	CONT	CONT
Quantity of RDT&E Articles	0	3	6	1	0	0	0	0		

*FY 1998 budget reflects $1,878K Congressional Add for Precision Targeting (E2422)

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The EA-6B weapon system is designed for jamming and destruction of enemy landbased, shipborne and airborne command, control and communications (C3) and radars associated with early warning, target acquisition surveillance, anti-aircraft artillery, air-to-surface, surface-to-surface, and surface-to-air missiles. In this capacity, it will support carrier based tactical aircraft, battle group operations, and joint forces, in dense radar controlled environments. The efforts under this program element (PE) provide for the electronic countermeasures response to these advanced threat weapon systems and C3 networks which are expanding in density and technical complexity. This PE funds the continuing development and integration of all EW systems for the EA-6B electronic support aircraft. The test articles being funded are; two EA-6B aircraft modified to support the Improved Capability (ICAP) III program and eight Low Band Transmitter (LBT) Engineering Development Models (EDMs). The two EA-6B aircraft modified to the ICAP III configuration are for the Engineering and Manufacturing Development (E&MD) phase of the program, (one validation aircraft will deliver in FY 2000; the other verification aircraft in FY 2001). These aircraft will be used as test articles during government test and evaluation (TECHEVAL/OPEVAL). The LBT EDMs are broken out as; three LBT Antenna Set EDMs for FY 1999 and five Amplifier Set EDMs for FY 2000. The ALQ-99 LBT Antenna Group will provide an expanded war fighting capability against the early warning/acquisition radars and communication links of modern integrated air defense systems. The LBT entered E&MD in September 1996. Approval for Low Rate Initial Production (LRIP) is anticipated in June 2001, followed by Full Rate Production (FRP) approval (Milestone III) in December 2001.

A requirement exists to begin planning and analysis of alternatives for a Command and Control Warfare (C2W) replacement to the EA-6B. This weapon system, known as the C2W follow-on, will be required after the year 2015.

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5 | **PROGRAM ELEMENT: 0604270N** | **PROGRAM ELEMENT TITLE: Electronic Warfare Development** | **PROJECT NUMBER: E0556** | **PROJECT TITLE: EW Counter Response**

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. FY 1998 ACCOMPLISHMENTS:

- (U) (1,878) (E2422) Congress zeroed all FY98 RDT&E funding due to late award of ICAP III contract. Congress later added funding to complete the demonstration of a flyable prototype for an anti-jamming Global Positioning System (GPS).
- (U) (3,400) (E0556) The LBT underwent redesign efforts required to meet key performance parameters. A Critical Design Review (CDR) was completed which showed the redesign of the LBT should successfully meet requirements. Two prototype amplifiers and antennas have been successfully tested.

2. FY 1999 PLAN:

- (U) (5,577) Continue software/techniques and test support for ongoing new threat development and testing in ICAP II. Continue Coherent Counter Measures (COCM) and Pro Forma Counter Measures (PCM) programs for the EA-6B (level of effort commensurate with available funds).
- (U) (54,683) Continue development of ICAP III system via contract awarded in March 1998. Specifically, FY99 efforts will perform laboratory testing, perform systems design, development and fabrication, and begin modification of two development aircraft with new tactical jamming and display equipment.
- (U) (3,300) Continue E&MD of the LBT and manufacture three complete Antenna Set EDM units.
- (U) (1,404) Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15 USC 638.

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5 | **PROGRAM ELEMENT: 0604270N** | **PROGRAM ELEMENT TITLE: Electronic Warfare Development** | **PROJECT NUMBER: E0556** | **PROJECT TITLE: EW Counter Response**

3. FY 2000 PLAN:

- (U) (8,700) Continue software/techniques and test support for ongoing new threat development and testing in ICAP II. Continue COCM and PCM programs for the EA-6B (level of effort commensurate with available funds).
- (U) (74,619) Continue development of ICAP III system. Specifically, FY00 efforts will perform laboratory testing, perform systems design, development and fabrication, and modification of two development aircraft with new tactical jamming and display equipment.
- (U) (4,000) Continue E&MD of the LBT. Manufacture and test five Amplifier Set EDM units.

(U) B. PROGRAM CHANGE SUMMARY

	FY 1998	FY 1999	FY 2000
(U) FY 1999 President's Budget:	1,941	65,373	70,769
(U) Appropriated Value:	2,676	65,373	
(U) Adjustments from Pres Budget:	+3,337	-409	+16,550
(U) FY2000/2001 President's Budget Submit:	5,278	64,964	87,319

DATE: February 1999

BUDGET ACTIVITY: 5 | **PROGRAM ELEMENT: 0604270N** | **PROGRAM ELEMENT TITLE: Electronic Warfare Development** | **PROJECT NUMBER: E0556** | **PROJECT TITLE: EW Counter Response**

CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY 1998 net increase of +$3,337 thousand reflects a -$63 thousand reduction for Small Business Innovative Research (SBIR) (E2422); and +$3,400 thousand increase for a Below Threshold Reprogramming (BTR) (E0556).

The FY 1999 net decrease of -$409 thousand reflects minor pricing adjustments.

The FY 2000 net increase of +$16,550 thousand reflects a +$1,000 thousand for C2W follow-on; +$4,000 thousand for LBT development; +$13,850 thousand for ICAP III development; +$37 thousand for NWCF rate adjustments; and -$2,337 thousand for minor pricing adjustments.

(U) Schedule: The ICAP III milestones have been adjusted due to the final contract award which lengthened the E&MD program. The LBT program, due to the technical problems discussed above, has slipped, and Milestone III is now in the 1st quarter of FY 2002.

(U) Technical: Not applicable.

(U) C. OTHER PROGRAM FUNDING SUMMARY

Appn	FY 1998 Budget	FY 1999 Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete
APN	**112,476**	**95,152**	**161,047**	**195,325**	**210,267**	**162,339**	**155,634**	**137,904**	**957,481**

Related RDT&E

DATE: February 1999

BUDGET ACTIVITY: 5 | **PROGRAM ELEMENT: 0604270N** | **PROGRAM ELEMENT TITLE: Electronic Warfare Development** | **PROJECT NUMBER: E0556** | **PROJECT TITLE: EW Counter Response**

(U) P.E. Not applicable.

(U) D. ACQUISITION STRATEGY:

- The LBT development contract occurred following a full and open competition and was awarded to Tracor-AEL. Following development and successful DT/OT, sole source production contracts will be awarded for LRIP in FY 2001 and FRP in FY 2002.
- The ICAP III contract, an E&MD CPFF/AF basic contract with two Fixed Price Incentive (FPI) production options, was awarded to a Northrop Grumman team in March 1998 following a full and open competition and Milestone II. Completion of these two events establishes formal milestones and changes in schedule. An LRIP decision will occur in FY 2002 following an operational assessment. Formal technical and operational evaluations (DT/OT) will occur in FY 2002 and FY 2003. Milestone III and FRP are scheduled for FY 2003.

(U) E. SCHEDULE PROFILE

	FY 1998	FY 1999	FY 2000	TO COMPLETE
(U) Program Milestones	2Q ICAPIII Milestone II			3Q/01 Low Band TX Program Review 2Q/03 ICAP III Milestone III 1Q/02 Low Band TX Milestone III
(U) Engineering Milestones		3Q ICAP III PDR	2Q ICAP III CDR	
(U) T&E Milestones				2Q/01 to 1Q/02 Low Band TX DT/OT 2Q/02 to 1Q/03 ICAP III DT/OT
(U) Contract Milestones	2Q ICAPIII Contract Awarded			3Q Low Band TX LRIP 1Q/02 Low Band TX FRP

EXHIBIT R-3, FY 2000 RDT&E,N COST ANALYSIS

DATE: February 1999

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604270N

PROJECT NUMBER: E0556

PROJECT TITLE: EW Counter Response

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Systems Engineering	WX	NRL, Wash. DC	5,816	650	Oct 98	900	Oct 99	CONT	CONT	
Systems Engineering	WX	NADEP, JAX	3,099	330	Oct 98	450	Oct 99	CONT	CONT	
Systems Engineering	WX	NSWC, Crane	4,592	1,280	Oct 98	1,800	Oct 99	CONT	CONT	
Systems Engineering	WX	NAWCAD, PAX	5,585	1,813	Oct 98	3,400	Oct 99	CONT	CONT	
Systems Engineering	WX	NAWCAD, LKE	1,864	100	Oct 98	150	Oct 99	CONT	CONT	
Systems Engineering	WX	NAWCWD, PT MUGU	8,489	3,590	Oct 98	4,785	Oct 99	CONT	CONT	
Primary Hardware Development	CPIF	AIL, Deer Park, NY	52,025	0	Nov 98	0	Nov 99	0	52,025	52,025
Primary Hardware Development	CPFF	Tracor/AEL, Lansdale, PA	15,227	3,300	Nov 98	4,000	Nov 99	4,000	26,527	23,000
Primary Hardware Development	CPAF/IF	Northrop Grumman, Bethpage, NY	19,500	47,765	Nov 98	64,937	Nov 99	38,344	170,546	132,335
Award Fees	CPAF	Northrop Grumman, Bethpage, NY	0	2,235	Apr 99	2,682	Apr 00	7,856	12,773	12,773
Primary Hardware Development	CPFF	Falon, Inc, San Diego, CA	3,246	0	Nov 98	0	Nov 99	0	3,246	3,246
Systems Engineering	Various	MISC	41,440	767	Nov 98	1,550	Nov 99	CONT	CONT	
Subtotal Product Development			**161,383**	**61,830**		**84,654**		**CONT**	**CONT**	

Remarks: The total cost figure for the TRACOR/AEL and the Northrop Grumman contracts are the Independent Government Estimate figures for total contract efforts less award fees, which are listed separately. The target value of contract figures are the total estimated cost of the awarded contracts less the award fees. To date no award fees have been paid to the contractor.

Development Support	SS/FP	JHU/APL, Columbia, MD	0	1,540	Nov 98	1,715	Nov 99	CONT	CONT	
Development Support	FP	Anaden Corp., Arlington, VA	0	40	Nov 98	0	Nov 99	0	40	
Development Support	Various	MISC	12,009	0	0	0	0	0	0	
Subtotal Support			**12,009**	**1,580**		**1,715**		**CONT**	**CONT**	

Remarks:

EXHIBIT R-3, FY 2000 RDT&E,N COST ANALYSIS

DATE: February 1999

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604270N

PROJECT NUMBER: E0556
PROJECT TITLE: EW Counter Response

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Operational Test and Evaluation	WX	OPTEVFOR, Norfolk, VA	1,459	150	Nov 98	950	Nov 99	CONT	CONT	
Subtotal Test & Evaluation			**1,459**	**150**		**950**		**CONT**	**CONT**	

Remarks: Funding is required to conduct ICAP III and LBT operational assessment planning, execution, and reporting.

Subtotal Management			**0**	**0**		**0**		**0**	**0**	
SBIR Assessment			**0**	**1,404**		**0**		**0**	**0**	
Remarks:										
Total Cost			**174,851**	**64,964**		**87,319**		**CONT**	**CONT**	

DATE: FEBRUARY 1999

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604270N** **PROJECT NUMBER: E2175**
PROGRAM ELEMENT TITLE: Electronic Warfare Development **PROJECT TITLE: TACAIR EW**

(U) COST: (Dollars in Thousands)

Project Number & Title	FY 1998 Budget	FY 1999 Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete	Total Program
E2175 Tactical Air Electronic Warfare										
	86,487	**67,396***	**73,051**	**32,288**	**7,784**	**0**	**0**	**0**	**0**	**495,844**
TOTAL										
Quantity of RDT&E Articles	481	458	2	2	0	0	0	0	0	0

* Includes $9.3 M Congressional Transfer being executed for IDECM under E2635.

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: INTEGRATED DEFENSIVE ELECTRONIC COUNTERMEASURES (IDECM): This joint service subproject develops the new techniques generator and fiber optic towed decoy of the Radio Frequency Countermeasures (RFCM) Subsystem as well as the Navy-unique portions of the Common Missile Warning System (CMWS) and Advanced Strategic and Tactical Expendables (ASTE). It also integrates RFCM, CMWS and ASTE with Radar Warning Receiver (RWR), Countermeasures Dispensing Set (CMDS) and associated cockpit controls and displays to provide the lead aircraft (F/A-18E/F) with increased survivability against Infrared/Radio Frequency (IR/RF) threats.

(U) AN/ALR-67(V)3&4 RADAR WARNING RECEIVER: This subproject is developing the system which provides enhanced situational awareness by providing accurate azimuth display of all programmed threats, independent of aircraft attitude. This also acts as Electronic Warfare (EW) Bus Controller.

(U) AN/ALE-50 ADVANCED AIRBORNE EXPENDABLE DECOY (AAED): This Joint Service (with Air Force) subproject is developing the system which will decoy enemy radio frequency homing missiles away from friendly aircraft.

(U) FLEET ELECTRONIC WARFARE SUPPORT GROUP (FEWSG): This subproject develops new EW equipment and technology which is used to provide realistic hostile EW threat environment, and support the evaluation and development of tactics and training.

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: FEBRUARY 1999

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604270N** **PROJECT NUMBER: E2175**
PROGRAM ELEMENT TITLE: Electronic Warfare Development **PROJECT TITLE: TACAIR EW**

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. FY 1998 ACCOMPLISHMENTS:
   - (U) ($56,661) IDECM: Continued funding E&MD contract for IDECM RFCM subsystem. Continued A-Kit design contract efforts for integration of the RFCM subsystem onto the F/A-18E/F and integration of CMWS/ASTE subsystems onto the AV-8B and F/A-18E/F. Provided funding to support Navy unique efforts in the Joint Service CMWS/ASTE programs. Initiated RFCM subsystem testing on the F/A-18 and CMWS/ASTE subsystems testing on the AV-8B. Continue Multiplatform Launcher Controller (MPLC) modifications for IDECM.
   - (U) ($15,608) ALR-67(V)3: Completed Technical Operational Assessment (OA) to support low rate initial production (LRIP). Begin Operational Evaluation (OPEVAL) to support full rate production. Continue test and integration support contract.
   - (U) ($11,366) AN/ALE-50/AAED: Completed OA on F/A-18E/F. Continued logistics development of Consolidated Automated Support System (CASS), Depot, and I-Level Test Program Set (TPS) and patch panels to conduct Shop Replaceable Assembly (SRA) maintenance. Completed Operational Test (OT) on B-1B.
   - (U) ($2,852) FEWSG: Completed FY98 prioritized equipment exploitations by performing technique upgrade studies and developing simulation expansion prototypes for AN/AST-6 and ALQ-167. Closed out AN/ALQ-170 Performance Enhancement Program (PEP) development efforts. Examined, cataloged, stored and disposed of PEP hardware, software and documentation developed through FY 1997.
2. FY 1999 PLAN:
   - (U) *($58,056) IDECM: Continue funding E&MD contract for IDECM RFCM subsystem. Perform IDECM RFCM subsystem operational assessment (OA) on F/A-18. Continue A-Kit design contract efforts for integration of the RFCM subsystem onto the F/A-18E/F and integration of CMWS/ASTE subsystems onto the AV-8B and F/A-18E/F. Provide funding to support Navy unique efforts in the Joint Service CMWS/ASTE programs. Continue RFCM subsystem testing on the F/A-18. Complete MPLC transition to IDECM configurations. *Includes the $9.3M (Project E2635) Congressional reappropriation of funding from APN line 48 at the Navy's request for continuation of the IDECM RFCM program.
   - (U) ($2,376) ALR-67(V)3: Complete all RDT&E,N efforts. Complete OPEVAL. Correct deficiencies after OPEVAL report.

2. FY 1999 PLAN: continued

- (U) ($3,164) AN/ALE-50/AAED: Complete logistics development of CASS, Depot, and 1-Level TPS and patch panels to conduct SRA maintenance. Complete OPEVAL on F/A-18E/F.

- (U) ($2,187) FEWSG: Prototype and test multi-threat frequency agile AST-6 Hi-J Band. Research I-Band ALQ-167 DRFM frequency extension . Test and prototype AST-6(V)X5 Airborne intercept Radars Simulator. Test and evaluate ALQ-167(V)62 techniques. Perform and test prototype conversion of ALQ-167(V)40 to (V)43. Research universal control box night vision goggles filter and research 200KW Travelling Wave Tube Amplifier (TWTA) for ALQ-167. Continue equipment exploitation.

- (U) *($1,613) Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15 USC 638. * Includes assessment for Project E2635.

3. FY 2000 PLAN:

- (U) ($73,051) IDECM: Continue funding Engineering and Manufacturing (E&MD) contract for IDECM RFCM subsystem. Continue A-Kit design contract efforts for integration of the RF subsystem onto the F/A-18E/F and integration of CMWS/ASTE subsystems onto the AV-8B and F/A-18E/F. Provide funding to Navy unique efforts in the Joint Service CMWS and ASTE programs. Conduct RFCM subsystem TECHEVAL and OPEVAL testing on the F/A-18E/F and CMWS and ASTE subsystems testing on the AV-8B.

- (U) ($0) FEWSG: Funds deleted due to Program Budget Decision (PBD) 604: Non pay inflation adjustment. The impact of this adjustment is that the FEWSG requirements will not be executable.

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: FEBRUARY 1999

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604270N** **PROJECT NUMBER: E2175**
PROGRAM ELEMENT TITLE: Electronic Warfare Development **PROJECT TITLE: TACAIR EW**

(U) B. PROGRAM CHANGE SUMMARY

	FY 1998	FY 1999	FY 2000
(U) FY 1999 President's Budget:	91,666	60,687	30,305
(U) Appropriated Value:	95,027	*69,987	
(U) Adjustments from Pres Budget:	-5,179	-2,591	+42,746
(U) FY 2000 President's Budget Submit:	86,487	*67,396	73,051

*FY 1999 Appropriated value includes $9.3 thousand for Project E2635 Congressional transfer.

CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1998 net decrease of -$5,179 thousand reflects -$3,250 thousand for a Small Business Innovation Research adjustment and $1,929 thousand for below threshold reprogrammings.

The FY 1999 net decrease of -$2,591 thousand reflects -$1,000 VECTOR offsets to N88, -$149 thousand for minor pricing adjustments and -$1,421 thousand for a contract advisory and assistance adjustment. Project E2635 decrease equals -$21 thousand for a Revised Economic Assumption adjustment.

FY 2000 net increase of +$42,746 thousand reflects +$16,933 thousand to restructure Tactical Aircraft Electronic Warfare systems for optimal funding, +$26,753 thousand for IDECM from the Acquisition Stability Reserve fund, +$10,600 thousand for ship depot maintenance adjustment, -$346 thousand for termination of Joint Emitter Targeting System (JETS), -$10,000 thousand for Tactical EW restructure, and -$1194 thousand for minor pricing adjustments.

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: FEBRUARY 1999

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604270N** **PROJECT NUMBER: E2175**
PROGRAM ELEMENT TITLE: Electronic Warfare Development **PROJECT TITLE: TACAIR EW**

(U) Schedule ALR-67(V)3 LRIP moved from 2Q/98 to 3Q/98. ALR-67(V)3 OPEVAL completion from 1Q/99 to 2Q/99. ALR-67(V)3 FRP moved from 2Q/99 to 3Q/99. IDECM DT IIB moved from 4Q/98-3Q/99 to 2Q/99-3Q/99. IDECM DT IIA moved from 3Q/98-2Q/99 to 1Q/99-4Q/99. IDECM RFCM LRIP moved from 2Q/99 to 4Q/99. RFCM OT-IIA Operational Assessment (OA) 3Q/99-4Q/99. IDECM DT IIC moved from 3Q/99-2Q/00 to 1Q/00-3Q/00. RFCM OPEVAL OT-IIA moved from 2Q/00-2Q/01 to 3Q/00-4Q/00.

(U) Technical Not applicable.

(U) C. OTHER PROGRAM FUNDING SUMMARY

Appn	FY 1998 Budget	FY 1999 Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete
APN Line 48 - AN/ALR-67(V)3 (Prior to FY96 - $130,105)	0	11,207	17,097	18,447	17,094	21,427	21,353	23,592	194,700
APN Line 41 - FEWSG	521	555	600	612	679	654	670	684	5,342
APN Line 48 - IDECM	0	0	0	5,579	10,967	12,908	22,322	13,022	142,600

Related RDT&E

(U) P.E. 0604270N (Advanced EW Technology)
(U) P.E 0604256N (Threat Simulator Development)

DATE: FEBRUARY 1999

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604270N** **PROJECT NUMBER: E2175**
PROGRAM ELEMENT TITLE: Electronic Warfare Development **PROJECT TITLE: TACAIR EW**

(U) C. ACQUISITION STRATEGY:

IDECM- Sole source LRIP contract (FY99), sole source FRP (FY01) contract with one option (FY02); full and open competition FRP contract with options (FY03 and beyond) AN/ALR-67(V)3-Sole source fixed price for LRIP with one fixed price option for production.

(U) D. SCHEDULE PROFILE

	FY 1998	FY 1999	FY 2000	To Complete
(U) Program Milestones	3Q/98 ALR-67(V)3 LRIP	3Q/99 ALR-67(V)3 FRP		
		4Q/99 RFCM LRIP		2Q/01 RFCM MS III
(U) Engineering Milestones				3Q/02 IDECM MS III
(U) T&E Milestones	3Q/98-2Q/99 ALR-67(V)3 OPEVAL			
		3Q-4Q/99 AAED SYS OPEVAL (F-18)		
		1Q/99-4Q/99 IDECM DT IIA	1Q/00-3Q/01 IDECM DT-IIC 3Q/00-4Q/00 OT-IIA RFCM OPEVAL	
		2Q/99-3Q/99 IDECM DT IIB 3Q/99-4Q/99 RFCM OT-IIA(OA)		1Q/01-4Q/01 IDECM DT-IID 1Q/02-2Q/02 OT-IIB IDECM OPEVAL RFCM FOT&E
(U) Contract Milestones				

EXHIBIT R-3, FY 2000 RDT&E,N COST ANALYSIS **DATE** FEBRUARY 1999

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604270N** **PROJECT NUMBER: E2175**
PROJECT TITLE: TACAIR EW

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Primary HDWR DEV(AN/ALR-67(V)3)	SS-CPFF	RAYTHEON/CA EL SEGUNDO	15789	1,554	2/99	0		0	17,343	17,343
Primary HDWR DEV (AN/ALE-50)	CPFF	RAYTHEON/CA GOLETA	8,697	1,175	12/98	0		0	9,872	9,872
ntegrated Logistics SPT (AN/ALE-50)	CPFF	RAYTHEON/ GOLETA,CA	16,637	1,250	12/98	0		0	17,887	17,887
Ancillary Hardware Development(IMPLC)		RAYTHEON/CA GOLETA,CA	17,828	1,218	12/98	1,626	12/99	701	21,373	21,373
Software Development (IDECM)	CPFF	RAYTHEON/CA EL SEGUND0	3,673	109	12/98	250	12/99	250	4,532	4,282
Primary Hardware Development (CMWS)	CPAF	SANDERS/NH	10,033	0		3,100	12/99	1,365	14,498	116,000
Primary Hardware Development (IDECM)	C-CPIF	SANDERS/NH	50,468	*31,492	01/99	30,775	12/99	16,664	129,399	176,700
Primary Hardware Develop (Award Fee)	AWARD	SANDERS/NH	1,350	0		0			1,350	
Software Development (IDECM)	TBD	TRACOR/TX	2,285	0		0		0	2,285	2,394
Primary Hardware Development (ASTE)	TBD	TRACOR/TX	3,102	1,740	12/98	1,100	12/99	458	6,400	22,000
Software Development (IDECM)	CPFF	LITTON/CA	4,350	0		0		0	4,350	4,959
Aircraft Platform Integration (IDECM)	TBD	BOEING, MO	56,919	6,889	12/98	8,700	12/99	2,245	74,753	74,753
Government Engineering Support	WX/RX	CHINA L/CA	29,916	6,187	10/98	8,640	10/99	CONT.	CONT.	
Government Engineering Support	WX/RX	PMTC,CA	36,882	1,863	12/98	0		0	38,745	38,745
MISCELLANEOUS (efforts < $1M each)		VARIOUS	10,805	*1,572	12/98	1,799	12/99	CONT.	CONT.	
Subtotal Project Development			**268,734**	**55,049**		**55,990**		**CONT**	**CONT**	

Remarks: For Sanders contract 74% of the planned FY96 award fee was awarded during first award period ($995k of $1,350k) Sanders (IDECM) target contract value includes Air Force funding and contractor nvestments. Navy portion of Sanders (IDECM) contract is only $129.4M. Sanders(CMWS) target contract value includes Army and Air Force funding and contractor investments. Navy portion of Sanders(CMWS) contract is $14.5M. TRACOR(ASTE) target contract value includes Air Force funding and contractor investments. Navy portion of TRACOR contract is $6.4 M.
*Includes $8M of Congressional transfer (Project E2635) for Sanders contract and balance of $1.3M is in the Miscellaneous column for support less than a million.

EXHIBIT R-3, FY 2000 RDT&E,N COST ANALYSIS **DATE FEBRUARY 1999**

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604270N** **PROJECT NUMBER: E2175**
PROJECT TITLE: TACAIR EW

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Program Management Support		NAWC-PAX	18,002	3,393	10/98	1,962	10/99	CONT.	CONT.	
MISCELLANEOUS (efforts < $1m each)		Various	5,614	193	10/98	869				
Subtotal Support			**23,616**	**3,586**		**2,831**				
Remarks										
ENGINEER/LOGISTIC/TECH SPT	WX	NAWC-AD/PAX	18,268	1,198	10/98	2,079	10/99	CONT.	CONT.	
ENGINEERING/TECH SPT	WX	NAWC-WD,CA	12,882	5,650	10/98	12,151	10/99	CONT.	CONT.	
MISCELLANEOUS (EFFORTS <$1M EACH)				300		0		CONT.	CONT.	
Subtotal Test & Evaluation			**31,150**	**7,148**		**14,230**		**CONT**	**CONT**	
Remarks										
Subtotal Management			**0**	**0**		**0**		**0**	**0**	
SBIR Assessment				*1,613						
Remarks: *Includes Proj E2635 SBIR assessment										
Total Cost			**323,500**	**67,396**		**73,051**		**32,288**		

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604270N** **PROJECT NUMBER: R2260**
PROGRAM ELEMENT TITLE: Electronic Warfare Development **PROJECT TITLE: Specific Emitter Indentification**

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1998 BUDGET	FY 1999 BUDGET	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
R2260 Specific Emitter Identification	1,376	1,688	1,811	1,813	1,869	1,927	1,982	2,039	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project supports systems development and collection of Specific Emitter Identification (SEI) information from National Technical Means (NTM) to track commercial ships over 200 gross registered tons world-wide. Research and development will cover improvements and enhancements to Electronic Intelligence technology. This will include improved/next generation SEI technology for miniaturization and automation of hardware, national collection systems, signal processing and analysis, and de-interleaving of signals. Propagation in a multi-path signal environment will also be assessed. All work on this project will be undertaken in pursuit of goals stated by the Office of Naval Intelligence and the National Security Agency in support of the Worldwide Ship Tracking Program.

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604270N** **PROJECT NUMBER: R2260**
PROGRAM ELEMENT TITLE: Electronic Warfare Development **PROJECT TITLE: Specific Emitter Indentification**

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1998	FY 1999	FY 2000
(U) FY 1999 President's Budget	1,381	1,697	1,976
(U) Appropriated Value	1,381	1,697	
(U) Adjustments from FY 1999 PRESBUDG	-5	-9	-165
(U) FY 2000 DoN Budget Submission	1,376	1,688	1,811

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY 1998 adjustment reflects an Actual Update adjustment (-$5). The FY 1999 adjustment reflects Revised Economic Assumptions (-$4) and Civilian Personnel Underexecution (-$5). The FY 2000 adjustment reflects a reduction for realignment of SEI to Training (-$200) and a net Navy Working Capital Fund Rate adjustment (+$35).

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5 | **PROGRAM ELEMENT: 0604270N** | **PROGRAM ELEMENT TITLE: Electronic Warfare Development** | **PROJECT NUMBER: R2260** | **PROJECT TITLE: Specific Emitter Indentification**

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

(U) FY 1998 Accomplishments:

(U) ($1,376) Work successfully demonstrated interoperability of SEI data in support of worldwide efforts. Data formats and connectivity was demonstrated through Joint Maritime Command Information Center (JMCIS) to address fleet requirements. New techniques for automation and data compression were evaluated for SEI application, including polynomials and wavelets.

(U) FY 1999 PLAN:

(U) ($1,688) Next generation SEI technology will be developed to provide miniaturized, automated, high fidelity operation. SEI hardware and enhanced windows-based software will be fielded at operational sites overseas and tested for acceptable operation. Extended signal processing technology will be developed to optically process data for increased throughput and reduced size.

(U) FY 2000 PLAN:

(U) ($1,811) Work will address the need for more noise-robust algorithms for increased SEI resolution and precision. Application of the new algorithms will permit de-interleaving and identification of modern complex wide-band signals.

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604270N** **PROJECT NUMBER: R2260**
PROGRAM ELEMENT TITLE: Electronic Warfare Development **PROJECT TITLE: Specific Emitter Indentification**

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

(U) RELATED RDT&E:

(U) PE 0602270N Electronic Warfare Technology
(U) PE 0603270N Advanced Electronic Warfare Technology

D. SCHEDULE PROFILE: Not applicable.

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604270N** **PROJECT NUMBER: R2260**
PROGRAM ELEMENT TITLE: Electronic Warfare Development **PROJECT TITLE: Specific Emitter Indentification**

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

Project Cost Categories	FY 1998	FY 1999	FY 2000
a. Software Development	445	391	394
b. Government Engineering Support	155	160	207
c. Developmental Test & Evaluation	162	330	360
d. Primary Hardware Development	380	467	510
e. Contractor Engineering Support	204	300	300
f. Program Management	30	40	40
Total	1,376	1,688	1,811

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604270N** **PROJECT NUMBER: R2260**
PROGRAM ELEMENT TITLE: Electronic Warfare Development **PROJECT TITLE: Specific Emitter Indentification**

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

PERFORMING ORGANIZATIONS

Contractor/Contract Government Performing Activity	Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1998 & Prior	FY 1999 Budget	FY 2000 Budget	FY 2001 Budget	To Complete	Total Program
Product Development										
TRW	FFP	10/98	2,500	2,500	400	541	568	576	405	2,500
NRL	WX	10/98	N/A	N/A	562	607	630	630	cont.	cont.
Support and Management										
NRL	WX	10/98	N/A	N/A	60	70	90	90	cont.	cont.
Test and Evaluation										
KAMAN		10/98	1,900	1,900	204	300	326	321	749	1,900
NRL	WX	10/98	5,649	5,649	150	170	197	196	4,936	5,649

EXHIBIT R-3, FY 2000 RDT&E,N COST ANALYSIS

DATE: February 1999

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604270N** **PROJECT NUMBER: R2260**

PROGRAM ELEMENT TITLE: Electronic Warfare Development **PROJECT TITLE: Specific Emitter Indentification**

GOVERNMENT FURNISHED PROPERTY

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Project Office EAC	Total FY 1998 & Prior	FY 1999 Budget	FY 2000 Budget	FY 2001 Budget	To Complete	Total Program
No Government Furnished Equipment									

	Total FY 1998 & Prior	FY 1999 Budget	FY 2000 Budget	FY 2001 Budget	To Complete	Total Program
Subtotal Product Development	962	1,148	1,198	1,206	cont.	cont.
Subtotal Support and Management	60	70	90	90	cont.	cont.
Subtotal Test and Evaluation	354	470	523	517	cont.	cont.
Total Project	1,376	1,688	1,811	1,813	cont.	cont.

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604270N**
PROGRAM ELEMENT TITLE: Electronic Warfare Development

PROJECT NUMBER: Z1742
PROJECT TITLE: Electronic Warfare Technical Development and Testing

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1998 BUDGET	FY 1999 BUDGET	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
Z1742 Electronic Warfare Technical Development and Testing	656	825	896	922	949	975	1,001	1,026	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: THIS program, referred to as "Skunkworks", establishes a standing research group for developing and testing low cost, high payoff Electronic Warfare (EW) systems to meet warfighting requirements during crisis situations. The program typically produces a new product at the end of each 12 month period. This unique characteristic ensures that the team continually functions in a quick reaction mode, and is therefore well trained in all aspects of rapid response systems engineering and fabrication. Each year, in the absence of a critical situation, the team develops, demonstrates and tests a prototype EW system which meets a specific Navy requirement.

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604270N
PROGRAM ELEMENT TITLE: Electronic Warfare Development

PROJECT NUMBER: Z1742
PROJECT TITLE: Electronic Warfare Technical Development and Testing

(U) Program Accomplishments and Plans:

1. FY 1998 Accomplishments:
   (U) ($200) Continued development of Advanced Support Pod (ASP) system. Integrated Naval Research Laboratory hardware with contractor software.
   (U) ($300) Conducted laboratory and field demonstration of ASP. Conducted flight testing for P-3 aircraft fleet clearance.
   (U) ($156) Continued to investigate ASP transition to rotary-wing platforms.

2. FY 1999 Plan:
   (U) ($290) Perform systems engineering and analysis for a tactical deception system.
   (U) ($445) Design and fabricate a deception unit.
   (U) ($ 90) Conduct field testing of the deception unit

3. FY 2000 Plan:
   (U) ($317) Perform systems engineering analysis for a system to provide localized protection from GPS-guided munitions.
   (U) ($460) Design and fabricate system to provide localized protection from GPS-guided munitions.
   (U) ($119) Conduct field testing on system to provide localized protection from GPS-guided munitions.

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604270N
PROGRAM ELEMENT TITLE: Electronic Warfare Development

PROJECT NUMBER: Z1742
PROJECT TITLE: Electronic Warfare Technical Development and Testing

(U) B. PROGRAM CHANGE SUMMARY

	FY 1998	FY 1999	FY 2000
(U) FY 1999 President's Budget:	656	829	879
(U) Appropriated Value:	656	829	
(U) Adjustments from Pres Budget:	0	-4	+17
(U) FY2000/2001 President's Budget Submit:	656	825	896

C. Other Program Funding Summary: Not Applicable.

D. Acquisiton Strategy: Not Applicable.

Exhibit R-2, RDT&E Budget Item Justification									Date: February 1999	
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/Budget Activity 5					R-1 ITEM NOMENCLATURE: SC-21 Total Ship Systems Engineering/PE 0604300N					
COST ($ in Millions)	**FY 1998**	**FY 1999**	**FY 2000**	**FY 2001**	**FY 2002**	**FY 2003**	**FY 2004**	**FY 2005**	**Cost to Complete**	**Total Cost**
Total PE Cost	58.548	125.964	162.056	250.719	259.629	255.326	283.413	271.857	Continuing	Continuing
Design/32464	52.763(1)	84.291(1)	112.087	174.380	176.102	193.515	247.240	252.190	Continuing	Continuing
DC/Survivability/32465	5.785(2)	6.182(2)	3.153	3.314	3.154	6.722	6.870	7.022	Continuing	Continuing
Multi Function Radar (MFR)/32466	0	35.491(3)	46.816	73.025	80.373	55.089	29.303	12.645	Continuing	Continuing
Quantity of RDT&E Articles & Cost			0	0	0	*1/TBD	0	0	Continuing	Continuing

Notes: (1) (U) FY 1998 and FY 1999 funds were budgeted and executed under PE 0604567N/Project S1803 and Project S2198 as displayed in the FY 99 President's Budget exhibits. Funds from PE 0604567N/Project S1803 and Project S2198 transitioned into PE 0604300N/Project 32464 in FY 2000 and out.

(2) (U) FY 1998 and FY 1999 funds were budgeted and executed under PE 0604516N/Project S1828 and Project S2054 as displayed in the FY 99 President's Budget exhibits. Funds from PE 0604516N/Project S1828 and Project S2054 transitioned into PE 0604300N/Project 32465 in FY 2000 and out.

(3) (U) FY 1999 funds were budgeted and executed under PE 0604755N/Project U2348 as displayed in the FY 99 President's Budget exhibits. Funds from PE 0604755N/Project U2348 transitioned into PE 0604300N/Project 32466 in FY 2000 and out.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This is a new Program Element (PE) that provides funds for development of the DD 21 Class of U. S. Navy surface combatants and advanced development R&D which is integral to DD 21. The mission of the DD 21 class is to provide affordable credible independent forward presence/deterrence and operate as an integral part of Naval, Joint or Combined Maritime Forces. DD 21 will provide an advanced level of land attack in support of the ground campaign and contribute to Naval, Joint or Combined battlespace dominance in littoral operations. DD 21 will establish and maintain surface and sub-surface superiority, provide local air defense, and will incorporate signature reduction to operate in all threat environments. DD 21 will have seamless Joint Interoperability to integrate all source information for battlespace awareness and weapons direction.

* (U) For explanation of Test Articles, see Project 32466.

Exhibit R-2, RDT&E Budget Item Justification	Date: February 1999
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/Budget Activity 5	R-1 ITEM NOMENCLATURE: SC-21 Total Ship Systems Engineering/PE 0604300N

B. (U) PROGRAM CHANGE SUMMARY:

	FY1998	FY 1999	FY 2000
(U) FY 1999 President's Budget	0	0	0
(U) Appropriated Value	N/A	N/A	N/A
(U) Adjustments to FY 1998 Appropriated Value/FY 1999 President's Budget	58.548	125.964	162.065
(U) FY 2000 President's Budget Submit	58.548	125.964	162.056

(U) Funding: The FY 2000 net increase of $162.056M is due to the realignment of programs. The FY 98/99 net increases of $58.548M and $125.964M respectively are due to Comparability Adjustments.

(U) Schedule: N/A

(U) Technical Parameters: Technical parameters are contained in the DD 21 Operational Requirements Document (ORD) approved by JROC on 16 October 1997.

Exhibit R-2a, RDT&E Project Justification									Date: February 1999	
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/Budget Activity 5			PROGRAM ELEMENT NAME AND NUMBER SC-21 Total Ship Systems Engineering/PE 0604300N					PROJECT NAME AND NUMBER: Design/32464		
COST ($ in Millions)	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Project Cost	52.763(1)	84.291(1)	112.087	174.380	176.102	193.515	247.240	252.190	Continuing	Continuing
RDT&E Articles Qty.	0	0	0	0	0	0	0	0	Continuing	Continuing

Notes: (1) (U) FY 1998 and FY 1999 funds were budgeted and executed under PE 0604567N/Project S1803 and Project S2198 as displayed in the FY 99 President's Budget exhibits. Funds from PE 0604567N/Project S1803 and Project S2198 transitioned into PE 0604300N/Project 32464 in FY 2000 and out.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project encompasses efforts for the total ship system engineering development and integration of Hull, Mechanical and Electrical (HM&E), communications, electronics, command and control, combat, weapons and shipboard systems into the DD 21 class. These engineering development and integration efforts include systems engineering, analysis, computer program development, interface design, technical documentation, and system testing to ensure fully functional systems integration. These systems engineering development efforts are required to ensure that DD 21 is a totally integrated ship system, delivering required warfighting technologies to the fleet within the reduced manning and cost goals.

1. (U) FY 1998 ACCOMPLISHMENTS
   - (U) ($16.500) Began DD 21 System Concept Development (Contract Phase I). Awarded 845/804 Agreement to begin DD 21 Initial Concept Development.
   - (U) ($20.690) Began implementation of a government engineering development team responsible for participation, oversight and monitoring of the industry team effort for DD 21. Began implementation of the DD 21 source selection and evaluation team that will be used to transition to Phase II of the acquisition strategy. Began development of the DD 21 Collaborative Engineering Data Center (CEDC) and Integrated Data Environment (IDE).
   - (U) ($3.431) Began DD 21 Test and Evaluation program. FY 1998 DD 21 Live Fire Test and Evaluation (LFT&E) efforts focused on advanced threat weapons effects including a demonstration of static anti-ship missile warhead damage.
   - (U) ($12.142) Began development of the operational context in which DD 21 will operate. This included development of the DD 21 Design Reference Mission (DRM) and Concept of Operations (CONOPS). Began implementation of DD 21 Manning/Human Systems Interface (HSI) and Integrated Logistics Support (ILS) Integrated Product Teams (IPTs) to address how industry-developed concepts will impact the future Navy support infrastructure in these functional areas. Began identification and risk reduction efforts in high risk areas such as manning, ILS, Total Ship Computing and certification.

Exhibit R-2a, RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/Budget Activity 5	PROGRAM ELEMENT NAME AND NUMBER SC-21 Total Ship Systems Engineering/PE 0604300N	PROJECT NAME AND NUMBER: Design/32464

2. (U) FY 1999 PLAN

- (U) ($38.300) Complete DD 21 System Concept Development (Phase I). System Concept Development includes a top level DD 21 concept, an initial DD 21 Performance Specification, top level cost estimates, and Integrated Logistics Support (ILS) and test plans to support the concept. Begin development of a Smart Product Model virtual prototype, which constitutes a complete representation of the ship's requirements, design and capabilities.
- (U) ($21.500) Continue implementation of the DD 21 Technical Team responsible for the participation, oversight and monitoring of the DD 21 Industry team's contract Phase I concepts. The team will provide the engineering expertise to evaluate/support the industry-developed concepts in the Combat Systems; HM&E; Signatures; C4ISR; Modeling and Simulation; Total Ship Computing; and Test and Evaluation; Manning and ILS. Complete development of CEDC and IDE.
- (U) ($8.495) Continue DD 21 LFT&E Program. FY 99 DD 21 LFT&E efforts will be focused in the following areas: mission recoverability (including damage control with reduced manning), magazine vulnerability (improved capability to assess munitions magazine vulnerability to current and future threats), advanced threat weapons effects (improved weapons effects predictive capabilities to address the advanced threats identified in the DD 21 STAR), damaged seaway survivability, and selected equipment vulnerability.
- (U) ($5.400) Complete development of the operational context in which DD 21 will operate. This includes development of the DD 21 DRM and CONOPS. Develop and brief results of DRM Operational Situations (OPSITs) to Navy fleet representatives.
- (U) ($9.321) Continue identification and risk mitigation efforts in high risk areas such as manning, Life Cycle Support and Engineering (LCS&E), Total Ship Computing and certification. Continue Manning/HIS and ILS IPTs to address the impact of how industry-developed concepts will impact the future Navy support infrastructure in these functional areas. Review and develop proposed policy changes as a result of DD 21 industry concepts that impact Navy manning and life cycle support structure as a result of Full Service Contractor (FSC) proposals.
- (U) ($1.275) Portion of extramural program is reserved for Small Innovative Research assessment in accordance with 15 USC 638.

3. (U) FY 2000 PLAN

- (U) ($77.967) Begin Contract Phase II for the development of two competitive initial system designs for DD 21. DD 21 industry teams will continue development of the system functional baseline, continue refinement of the performance specification, continue to develop and validate cost estimates, and continue to develop a detailed total ship design leading to a Preliminary Design Review (PDR). Continue development of the Smart Product Model virtual prototype, which constitutes a representation of the ship's requirements, design and capabilities at the preliminary design level.
- (U) ($22.805) Continue implementation of the DD 21 Technical Team responsible for the participation, oversight and monitoring of the two industry designs in Contract Phase II. The Engineering team consists of Government Labs, Universities and selected technical support contractors. This technical team provides the expertise to evaluate/support the DD 21 industry design in the areas of Combat Systems; HM&E; Signatures; C4ISR; Modeling and Simulation; Total Ship Computing; Test and Evaluation; Manning and ILS.

Exhibit R-2a, RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/Budget Activity 5	PROGRAM ELEMENT NAME AND NUMBER SC-21 Total Ship Systems Engineering/PE 0604300N	PROJECT NAME AND NUMBER: Design/32464

- (U) ($6.030) Development of DD 21 Live Fire Test & Evaluation (LFT&E) plan. The DD 21 LFT&E program will focus on the following areas: Mission Recoverability, Magazine Protection, Damaged Seaway Survival, Selected Equipment Vulnerability, Advanced Weapon Threat Effects, and required documentation. These areas address critical elements of DD 21 survivability as defined in the Test and Evaluation Master Plan (TEMP) and the Operational Requirements Document (ORD). Test results will be used to improve modeling and simulation capability and will support DD 21 design evaluations.
- (U) ($5.285) Continue identification and risk mitigation efforts in high risk areas such as manning, Life Cycle Support and Engineering (LCS&E), Total Ship Computing and certification. Continue Manning/HIS and ILS IPTs to address the impact of how industry-developed concepts will impact the future Navy support infrastructure in these functional areas. Review and develop proposed policy changes as a result of DD 21 industry concepts that impact Navy manning and life cycle support structure as a result of Full Service Contractor (FSC) proposals.

B. (U) OTHER PROGRAM FUNDING SUMMARY:

COST ($ in Millions)	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Complete	Total Cost
Shipboard System Component Development/PE 0603513N	56.961	100.748	108.334	114.643	135.178	110.292	101.859	93.316	Continuing	Continuing

C. (U) ACQUISITION STRATEGY:

(U) The DD 21 acquisition strategy encompasses five contract phases: Phase I – System Concepts, Phase II – Initial System Design, Phase III – System Design, Phase IV – Detail Design and Construction, and Phase V – Engineering and Logistics Life Cycle Support. The Navy will award section 845/804 agreements for Phases I and II for two DD 21 Industry teams. Downselection to a single DD 21 Full Service Contractor will occur in mid FY 2001 to begin Contract Phase III.

Exhibit R-2a, RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/Budget Activity 5	PROGRAM ELEMENT NAME AND NUMBER SC-21 Total Ship Systems Engineering/PE 0604300N	PROJECT NAME AND NUMBER: Design/32464

D. (U) SCHEDULE PROFILE:

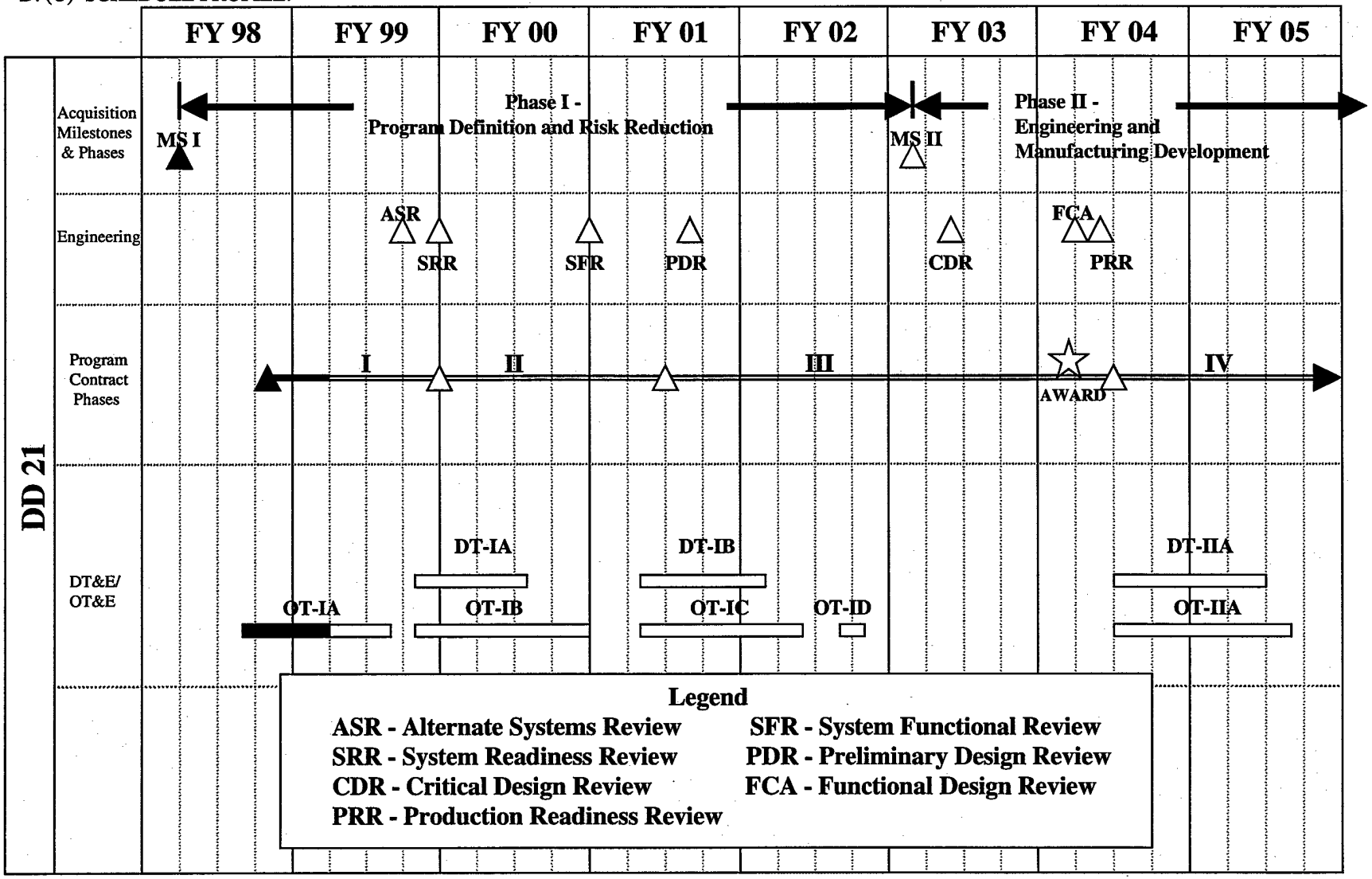


Exhibit R-3, Cost Analysis (page 1)								Date: February 1999		
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/ Budget Activity 5			PROGRAM ELEMENT NAME AND NUMBER: SC-21 Total Ship Systems Engineering/PE0604300N					PROJECT NAME AND NUMBER: Design/32464		
Cost Categories (Tailor to WBS, or System / Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Initial System Design	Sect 845/804	DD 21 Industry Teams	16.500	35.500	11/98	77.967	10/99	Continuing	Continuing	
Subtotal Product Development			**16.500**	**35.500**		**77.967**		**Continuing**	**Continuing**	
Remarks										
Subtotal Support			**0**	**0**		**0**		**Continuing**	**Continuing**	
Remarks: (U) Support costs during this period will be rolled up in development contracts cost.										
Live Fire Test & Evaluation (LFT&E)	Sect 845/804	DD 21 Industry Teams	0	2.425	2QFY99	1.750	10/99	Continuing	Continuing	
	WR	NSWC CD Bethesda, MD	2.320	4.512	2QFY99	3.280	1QFY00	Continuing	Continuing	
	WR	NSWC DD Dahlgren, VA	0.200	0	N/A	0	N/A	Continuing	Continuing	
	TBD	Various	0.911	1.558	TBD	1.000	TBD	Continuing	Continuing	
Subtotal T&E			**3.431**	**8.495**		**6.030**		**Continuing**	**Continuing**	
Remarks:										

Exhibit R-3, Cost Analysis (page 2)								Date: February 1999		
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/ Budget Activity 5			PROGRAM ELEMENT NAME AND NUMBER: SC-21 Total Ship Systems Engineering/PE0604300N					PROJECT NAME AND NUMBER: Design/32464		
Cost Categories (Tailor to WBS or System / Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Contracting Engineering Support	GSA	Techmatics Arlington, VA	1.800	1.500	1QFY99	1.200	1QFY00	Continuing	Continuing	
	GSA	Vitro Arlington, VA	1.000	1.000	1QFY99	1.000	1QFY00	Continuing	Continuing	
	Misc.	Various	1.300	0.500	1QFY99	0.362	1QFY00	Continuing	Continuing	
Government Engineering Support	WR	NSWC DD Dahlgren, VA	12.490	12.300	1QFY99	12.318	1QFY00	Continuing	Continuing	
	WR	NSWC CD Bethesda, MD	3.660	3.975	1QFY99	1.959	1QFY00	Continuing	Continuing	
	WR	NSWC CR Crane, IN	0.665	2.492	1QFY99	0.530	1QFY00	Continuing	Continuing	
	WR	NSWC PHD Pt Hueneme, CA	0.370	1.920	1QFY99	0.815	1QFY00	Continuing	Continuing	
	WR	SSCSD San Diego, CA	0.970	1.670	1QFY99	1.670	1QFY00	Continuing	Continuing	
	WR	NUWC/N Newport, RI	0.846	1.159	1QFY99	1.206	1QFY00	Continuing	Continuing	
	WR	NAWC TSD Orlando, FL	0.150	0.150	1QFY99	0.150	1QFY00	Continuing	Continuing	
	WR	NAWC AD(LKE) Lakehurst, NJ	0	0	N/A	0.075	1QFY00	Continuing	Continuing	
	Various	Various	4.370	4.600	1QFY99	0.405	1QFY00	Continuing	Continuing	
University Research	CPFF	APL/JHU Laurel, MD	0.940	3.730	1QFY99	1.722	1QFY00	Continuing	Continuing	
Program Management Support	Various	Various	4.071	4.300	1QFY99	3.278	1QFY00	Continuing	Continuing	
Travel	Various	Various	0.200	1.000	Various	1.400	Various	Continuing	Continuing	
Subtotal Management			**32.832**	**40.296**		**28.090**		**Continuing**	**Continuing**	
Remarks:										
Total Cost			**52.763**	**84.291**		**112.087**		**Continuing**	**Continuing**	
Remarks:										

Exhibit R-2a, RDT&E Project Justification								Date: February 1999	
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/Budget Activity 5		PROGRAM ELEMENT NAME AND NUMBER SC-21 Total Ship Systems Engineering/PE 0604300N					PROJECT NAME AND NUMBER: DC/Survivability/32465		
COST ($ in Millions)	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Project Cost	5.785(1)	6.182(1)	3.153	3.314	3.154	6.722	6.870	7.022	Continuing	Continuing
RDT&E Articles Qty	0	0	0	0	0	0	0	0	Continuing	Continuing

Notes: (1) (U) FY 1998 and FY 1999 funds were budgeted and executed under PE 0604516N/Project S1828 and Project S2054 as displayed in the FY 99 President's Budget exhibits. Funds from PE 0604516N/Project S1828 and Project S2054 transitioned into PE 0604300N/Project 32465 in FY 2000 and out.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project funds the engineering development of DD 21 ship protection and damage control/firefighting systems and features that reduce vulnerability against conventional weapons (e.g., missiles, mines, torpedoes) and peacetime accidents that enable an effective recovery of mission capability. The requirements for this project are based on the need to develop affordable, balanced DD 21 survivability designs that address recent wartime lessons learned and meet established DD 21 survivability goals. Additionally, this project addresses survivability requirements applicable to the existing fleet and other ship acquisition programs (e.g., LPD 17, CVX, LHX).

(U) Development areas include: 1) computer-based damage control systems that enable reduced manning through systems automation, minimizing the need for manual Damage Control (DC) actions; 2) personnel protection systems/devices that increase endurance and reduce stress on DC personnel during sustained operations; 3) tactics and doctrine for attacking major threat, ship threatening conflagration; 4) damage tolerant structures that increase hull girder survival against underwater explosions; and 5) system protection devices that enable continued system operation after damage.

1. (U) FY 1998 ACCOMPLISHMENTS
   - (U) ($0.744) Completed design and construction set-up for conducting full-scale weapon effects Test and Evaluation (T&E) of electrical fault clearing device that provides for uninterruptable power after damage.
   - (U) ($1.300) Continued firefighting experiments aboard the ex-USS SHADWELL in support of developing tactics and doctrine for the water mist fire extinguishing and smoke ejection systems
   - (U) ($1.573) Continued development of the pre-hit configuration management module.
   - (U) ($2.168) Initiated development of damage tolerant structural fabrication techniques and 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. Initiated design of configurations that limit holing and flooding. Continued Real Time Damage Tracking (RTDT) fire/smoke sensor evaluations aboard the USS RUSHMORE. Completed Damage Control System (DCS) Human Computer Interface guidelines. Provided software support for DCS T&E ships. Initiated 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. Initiated evaluation of conditioned firefighting clothing (Integrated Firefighter's Protective Ensemble). Initiated evaluation of personnel monitoring systems.

Exhibit R-2a, RDT&E Project Justification		Date: February1999
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/Budget Activity 5	PROGRAM ELEMENT NAME AND NUMBER SC-21 Total Ship Systems Engineering/PE 0604300N	PROJECT NAME AND NUMBER: DC/Survivability/32465

2. (U) FY 1999 PLAN

- (U) ($0.343) Conduct full-scale weapons effects T&E of the electrical fault clearing device.
- (U) ($1.170) Complete firefighting experiments aboard the ex-USS SHADWELL in support of developing tactics and doctrine for the water mist and smoke ejection systems.
- (U) ($2.427) Continue development of the pre-hit configuration module. Complete software coding for moderately fast missile hit point prediction utilizing CIWS data. Initiate system automation designs for the electrical, fluid and total ship computing plant systems. Initiate DD 21 combat/damage control systems integration for monitoring advanced projected DD 21 threats.
- (U) ($1.937) Continue design of damage tolerant hull girder configurations that limit holing and flooding and prevent ship sinking from close-in UNDEX; develop designs. Complete RTDT fire/smoke sensor evaluations aboard the USS RUSHMORE. Complete shipboard evaluations of cold water/weather and anti-exposure suits with body heat retention systems. Complete evaluation of conditioned firefighting clothing that increases the time firefighters can remain on-station during extreme environments. Continue evaluation of personnel monitoring systems. Initiate development of a lightweight firefighter/boundary suit ensemble. Initiate evaluation of hands-free communication devices that enable direct, clear communication between on-scene firefighters.
- (U) ($0.200) Initiate development of a shipboard electrical fault simulation and coordination 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) ($0.105) Portion of extramural program is reserved for Small Business Innovative Research assessment in accordance with 15 USC 638.

3. (U) FY 2000 PLAN

- (U) ($2.175) Continue development of the pre-hit Configuration Management capability. Continue DD 21 combat/damage control systems integration for monitoring advanced, projected DD 21 threats. Continue system automation designs for the electrical, fluid and total ship computing plant systems.
- (U) ($0.678) Continue development and evaluation of specific elements of damage control and survivability and continuation of design of damage tolerant structural fabrication details that limit holing and flooding and prevent ship sinking from close-in underwater explosions.
- (U) ($0.300) Continue development of a shipboard electrical fault simulation and coordination model that generates weapon-induced fault conditions for use in supporting electrical system design diagnostics and for training to restore electrical systems; prepare software development plan and initial coding.

B. (U) OTHER PROGRAM FUNDING SUMMARY:

COST ($ in Millions)	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Complete	Total Cost
Shipboard System Component Development/PE 0603513N	56.961	100.748	108.334	114.643	135.178	110.292	101.859	93.316	Continuing	Continuing

C. (U) ACQUISITION STRATEGY:

(U) These development efforts were realigned into this project in an effort to consolidate related DD 21 RDT&E efforts and will be transitioned into the DD 21 acquisition strategy in FY 2000 and out.

Exhibit R-2a, RDT&E Project Justification		Date: February1999
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/Budget Activity 5	PROGRAM ELEMENT NAME AND NUMBER SC-21 Total Ship Systems Engineering/PE 0604300N	PROJECT NAME AND NUMBER: DC/Survivability/32465

D. (U) SCHEDULE PROFILE:

PROGRAM MILESTONES

FY 1998	FY 1999	FY 2000
1Q Electrical Fault Clearing Device T&E		
2Q DCS HCI Guidelines		
4Q Pre-Hit Configuration Management Software Requirements	4Q Pre-Hit Configuration Management Software Code	
	4Q UNDEX Designs	3Q Damage Tolerant Structural Configurations
	4Q Shipboard Fault Simulation Modeling Approaches	
	3Q Water Mist/ Smoke Ejection Systems Evaluations	
	4Q Cold Water/ Weather Evaluations	
	4Q Conditioned Firefighting Clothing Evaluations	
	4Q Personnel Monitoring System Evaluations	4Q Personnel Protection Monitor System Specification

Exhibit R-3, Cost Analysis (page 1)								Date: February 1999		
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/ Budget Activity 5			PROGRAM ELEMENT NAME AND NUMBER: SC-21 Total Ship Systems Engineering/PE0604300N				PROJECT NAME AND NUMBER: DC/Survivability/32465			
Cost Categories (Tailor to WBS, or System / Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Product Development	Sect 845/804	DD 21 Industry Teams	0	2.180	11/98	2.427	10/99	Continuing	Continuing	
	WR	NSWC CD Bethesda, MD	2.249	1.397	11/98	0.400	10/99	Continuing	Continuing	
	Various	Other Govt. Activities	2.911	2.150	Various	0.226	Various	Continuing	Continuing	
	Various	Other Contractors	0.625	0.455	Various	0.100	Various	Continuing	Continuing	
Subtotal Product Development			**5.785**	**6.182**		**3.153**		**Continuing**	**Continuing**	
Remarks: Notes:										
Subtotal Support			**0**	**0**		**0**				
Remarks: Notes:										

Exhibit R-3, Cost Analysis (page 2)								Date: February 1999		
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/ Budget Activity 5			PROGRAM ELEMENT NAME AND NUMBER: SC-21 Total Ship Systems Engineeringt/PE0604300N					PROJECT NAME AND NUMBER: DC/Survivability/32465		
Cost Categories (Tailor to WBS or System / Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Subtotal T&E			**0**	**0**		**0**				
Remarks:										
Subtotal Management			**0**	**0**		**0**				
Remarks:										
Total Cost			**5.785**	**6.182**		**3.153**		**Continuing**	**Continuing**	
Remarks:										

Exhibit R-2a, RDT&E Project Justification									Date: February 1999	
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/Budget Activity 5		PROGRAM ELEMENT NAME AND NUMBER SC-21 Total Ship Systems Engineering/PE 0604300N					PROJECT NAME AND NUMBER: Multi Function Radar (MFR)/32466			
COST ($ in Millions)	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Project Cost	0	35.491(1)	46.816	73.025	80.373	55.089	29.303	12.645	Continuing	Continuing
RDT&E Articles Qty	0	0	0	0	0	1	0	0	Continuing	Continuing

Notes: (1) (U) FY 1999 funds were budgeted and executed under PE 0604755N/Project U2348 as displayed in the FY 99 President's Budget exhibits. Funds from PE 0604755N/Project U2348 transitioned into PE 0604300N/Project 32466 in FY 2000 and out.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project provides funds for the development of the Multi-Function Radar (MFR) in association with DD 21 as the lead ship development effort. The MFR will provide DD 21 and other applicable surface ships with an affordable, high performance radar system for ship's defense well into the next century. The MFR system is based on solid state, active array radar technology and will provide search, detect, track, and weapon control functions while dramatically reducing manning and life-cycle costs associated with multiple systems that perform these functions today. The MFR will achieve a level of force protection that greatly enhances ship defense capability against all threats envisioned in the littoral environment. The Test Article will be available in FY 03 to support DT/OT land-based and at-sea testing.

1. (U) FY 1998 ACCOMPLISHMENTS
   - N/A

2. (U) FY 1999 PLAN
   - (U) ($27.205) Complete MFR Concept Definition (Contract Phase II). Continue MFR development program (Contract Phase III). Conduct source selection of Engineering and Manufacturing Development (E&MD) development contractor. Award E&MD contract and conduct Preliminary Design Review (PDR).
   - (U) ($7.500) Government Engineering and support services. Monitor Phase II contract effort. Conduct source selection for E&MD development contractor. Monitor Phase III E&MD contract effort.
   - (U) ($0.786) Portion of extramural program is reserved for Small Business Innovation Research assessment in accordance with 15 USC 638.

3. (U) FY 2000 PLAN
   - (U) ($38.766) Continue E&MD phase of MFR. Conduct Critical Design Review (CDR) and procure Engineering Development Model (EDM) material.
   - (U) ($7.050) Government Engineering Services for E&MD including systems engineering analysis.
   - (U) ($1.000) Government Engineering and logistics support.

B. (U) OTHER PROGRAM FUNDING SUMMARY:

COST ($ in Millions)	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Complete	Total Cost
Shipboard System Component Development/PE 0603513N	56.961	100.748	108.334	114.643	135.178	110.292	101.859	93.316	Continuing	Continuing

Exhibit R-2a, RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/Budget Activity 5	PROGRAM ELEMENT NAME AND NUMBER SC-21 Total Ship Systems Engineering/PE 0604300N	PROJECT NAME AND NUMBER: Multi Function Radar (MFR)/32466

C. (U) ACQUISITION STRATEGY:

(U) Currently in competitive Concept Refinement Phase II with three industry teams. In FY 1999, the Government will downselect to a single industry team to conduct Phase III E&MD. DT/OT anticipated in FY 2003/04. After MFR downselect, the Government will consider incorporating these efforts into the DD 21 Acquisition Strategy.

Exhibit R-2a, RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/Budget Activity 5	PROGRAM ELEMENT NAME AND NUMBER SC-21 Total Ship Systems Engineering/PE 0604300N	PROJECT NAME AND NUMBER: Multi Function Radar (MFR)/32466

D. (U) SCHEDULE PROFILE:

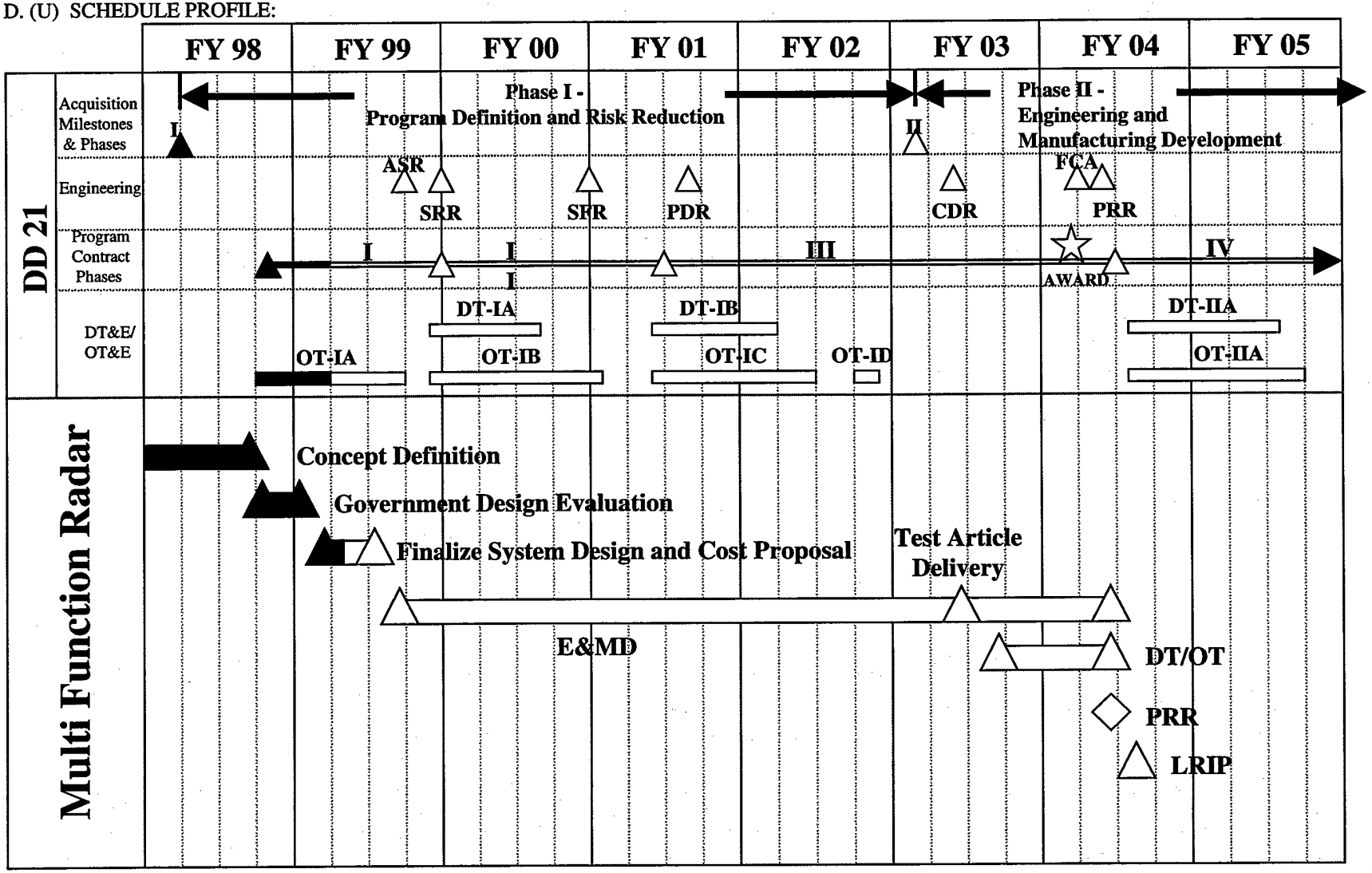


Exhibit R-3, Cost Analysis (page 1)									Date: February 1999		
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/ Budget Activity 5			PROGRAM ELEMENT NAME AND NUMBER: SC-21 Total Ship Systems Engineering/PE0604300N						PROJECT NAME AND NUMBER: Multi Function Radar (MFR)/32466		
Cost Categories (Tailor to WBS, or System / Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date	Cost To Complete	Total Cost	Target Value of Contract	
	CPAF/IF	Prime E&MD TBD	0	27.205	5/99	38.766	11/99	154.411	220.382	220.392	
Subtotal Product Development			**0**	**27.205**		**38.766**		**154.411**	**220.382**	**220.392**	
Remarks:											
Subtotal Support			**0**			**0**		**Continuing**	**Continuing**		
Remarks:											
(U) FY 1999 and FY 2000 support costs will be rolled up into the E&MD contract.											

Exhibit R-3, Cost Analysis (page 2)								Date: February 1999		
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/ Budget Activity 5			PROGRAM ELEMENT NAME AND NUMBER: SC-21 Total Ship Systems Engineering/PE0604300N					PROJECT NAME AND NUMBER: Multi Function Radar/32466		
Cost Categories (Tailor to WBS or System / Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Subtotal T&E			**0**	**0**		**0**		**Continuing**	**Continuing**	
Remarks:										
(U) No Developmental or Operational Test and Evaluation will be conducted during FY 1999 through FY 2001.										
Government Engineering Support	WR	NSWC-DD Dahlgren, VA	0	2.000	1QFY99	2.000	1QFY00	Continuing	Continuing	
	WR	NSWC-PHD Pt Hueneme, CA	0	1.000	1QFY99	1.000	1QFY00	Continuing	Continuing	
	SS/CPFF	JHU/APL Laurel, MD	0	1.000	1QFY99	1.100	1QFY00	Continuing	Continuing	
	WR	Miscellaneous	0	2.600	1QFY99	2.950	1QFY00	Continuing	Continuing	
Program Management Support	C/CPFF	Various	0	1.686	1QFY99	1.000	1QFY00	Continuing	Continuing	
Subtotal Management			**0**	**8.286**		**8.050**		**Continuing**	**Continuing**	
Remarks:										
Total Cost			**0**	**35.491**		**46.816**		**Continuing**	**Continuing**	
Remarks:										

Exhibit R-2, RDT&E Budget Item Justification	Date: FEBRUARY 1999
RDT&E 1319/Budget Activity 5	AEGIS Combat System Engineering, PE0604307

COST ($ in Millions)	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Total P.E. Cost	110.14	178.43*	204.48	192.27	178.69	142.84	114.45	95.83	CONT.	CONT.
Surf Combatant Combat Sys/K1447	72.97	129.40	193.01	187.02	174.35	138.42	109.93	91.22	CONT.	CONT.
Surf Combatant Weapon Sys Mod/K1776	5.43	7.19	4.21	4.26	4.32	4.40	4.49	4.58	CONT.	CONT.
Surf Combatant Weapons Dev/K1937	0.00	6.86	7.24	0.97	0.01	0.01	0.02	0.02	CONT.	CONT.
Smart Ship Project/K2308	0.90	0.56	0.02	0.02	0.01	0.01	0.01	0.01	CONT.	CONT.
TBMD/UYQ-70 Architecture Dev/K2424	30.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	CONT.	CONT.
CEC Integration on DDG-51 Ships/K2636	0.00	9.48	0.00	0.00	0.00	0.00	0.00	0.00	CONT.	CONT.
AEGIS Baseline Software Development/K2637	0.00	19.95	0.00	0.00	0.00	0.00	0.00	0.00	CONT.	CONT.
DDG-51 Composite Director Room/K2638	0.00	4.99	0.00	0.00	0.00	0.00	0.00	0.00	CONT.	CONT.
Quantity of RDT&E Articles & cost	Not applicable.									

A. 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.

* This includes an intended FY 1999 reprogramming (DD1415) for $15.20.

Exhibit R-2, RDT&E Budget Item Justification	Date: FEBRUARY 1999
RDT&E 1319/Budget Activity 5	AEGIS Combat System Engineering, PE0604307

B. Program Change Summary:

	FY 1998	FY 1999	FY 2000
FY 1999 President's Budget:	118.54	132.57	175.95
Appropriated Value:	148.13	164.07	
Adjustment to FY 1998 Appropriated Value/			
FY 1999 President's Budget:	-37.99	+14.36	+28.53
FY 2000 PRES Budget Submit:	110.14	178.43	204.48

Funding: FY 1998 change due to SBIR Reduction, Federal Technology Transfer, Navy wide adjustment, and transfer of High Power Discriminator (HPD) money to BMDO. FY99-00 funding changes are due to two factors: 1) To resolve recently identified interoperability issues and integration requirements for Aegis (ADS Mk6)/CEC, and 2) Subsequent extension of Cooperative Engagement Capability (CEC) OPEVAL.

Schedule: Baseline 6 Phase III development will be extended one year and Baseline 7 Phase I will be extended 10 months to: 1) Complete necessary testing to ensure that those baselines will meet all functional requirements and 2) Incorporate lessons learned from the Baseline 6 Phase I AEGIS Weapon System (AWS)/CEC integration effort. All baselines will still be delivered to shipbuilders within contractual dates.

Technical: Not applicable.

Exhibit R-2a, RDT&E Project Justification			Date: FEBRUARY 1999
RDT&E 1319, Budget Activity 5	AEGIS Combat System Engineering, PE0604307	Surface Combatants Combat System Improvements, K1447 CEC Integration on DDG-51 Ships, K2636 AEGIS Baseline Software Development, K2637	

Cost ($ in Millions)	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
K1447	72.97	129.40	193.01	187.02	174.35	138.42	109.93	91.22	CONT.	CONT.
K2636	0.00	9.48	0.00	0.00	0.00	0.00	0.00	0.00	CONT.	CONT.
K2637	0.00	19.95	0.00	0.00	0.00	0.00	0.00	0.00	CONT.	CONT.
Total	72.97	158.83	193.01	187.02	174.35	138.42	109.93	91.22	CONT.	CONT.
RDT&E Articles Qty	Not applicable.									
Note: Projects K2636 and K2637 are FY1999 Congressional plus-ups. These projects fund efforts that are an integral part of the core Surface Combatant Combat Systems Improvements program. For consistency across the FYDP, these projects are grouped together in FY1999.										

A. Mission Description and Budget Item Justification: This program provides AEGIS Cruiser and Destroyer Combat System upgrades and integrates new equipment 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 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 supported 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 Phase I supports OPEVAL of CEC in CGs 66 and 69 and will be introduced in the DDG 51 class beginning with the last ship in FY94, DDG 79. Baseline 6 Phase III is planned for the first ship in FY 1997. Baseline 6 Phase III is the designation for the combat system upgrade resulting from consolidation of the previous Baseline 6 Phase II with functions designed to introduce Theater Ballistic Missile Defense (TBMD) to in-service ships. Baseline 6 upgrades will also include embarked helicopters, Fiber Optics as applied to Data Multiplexing (FODMS), 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 System (ATWCS) Phase II, Fire Control System Upgrades, and the Joint Maritime Command Information System (JMCIS). Baseline 7 Phase I is planned for the third MYP DDG-51 Class ship in FY 1998. Major Baseline 7 upgrades include but are not limited to: AN/SPY-1D(V) Radar upgrade, COTS-based advanced computer processing, and Advanced Integrated Electronic Warfare System (AIEWS). There is a follow-on baseline planned for integrated land attack and fully distributed computer architecture. The Cruiser Conversion program will upgrade cruisers with Theater Ballistic Missile Defense, land attack, and Area Air Defense Commander (AADC) capabilities, along with "Smart Ship" like Integrated Control Systems.

FY 1998 ACCOMPLISHMENTS:

Exhibit R-2a, RDT&E Project Justification		Date: FEBRUARY 1999
RDT&E 1319, Budget Activity 5	AEGIS Combat System Engineering, PE0604307	Surface Combatants Combat System Improvements, K1447 CEC Integration on DDG-51 Ships, K2636 AEGIS Baseline Software Development, K2637

- ($13.61) Conducted element test and evaluation (ET&E) and multi-element integration testing (MEIT) for Baseline 6 Ph I, focusing on achieving AWS stability in preparation for CEC OPEVAL and forward-fit baseline development.
- ($23.10) Conducted Baseline 6 Phase III consolidated Preliminary Design Review (PDR)/Critical Design Review (CDR) in accordance with the Baseline Consolidation Plan. Began computer program coding, debugging, and testing. Completed RSCES EDM Development.
- ($15.41) Completed system definition/design for full integration of SPY-1D(V) into new construction AEGIS Combat System in Baseline 7 Phase I and started system design. Conducted Baseline 7 Phase I System Design Review (SDR) for integration of upgrades into the AEGIS Combat System engineering.
- ($6.10) 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.
- ($14.75) Provided funds for labs and field activities to support forward fit baseline upgrade in order to conduct engineering and scientific studies and analysis to minimize the risk in the introduction of increased warfighting capability including TBMD, CEC, ESSM, and AIEWS into the AEGIS Combat System. Studies produced by the Applied Physics Lab and the Naval Surface Warfare Center, Dahlgren Division (NSWC, DD) ensure effective introduction of Commercial Off the Shelf Technology (COTS). NSWC, DD personnel also provided on site technical support at contractor facilities during development, testing, and evaluation of upgrades to the AEGIS Combat System.

FY 1999 PLAN:

- ($1.00) Begin modifications to the AWS computer program to allow incorporation of AAW capability into the SM2 BLK IVA missile.
- ($42.20) Continue with ET&E and MEIT for Baseline 6 Ph I. Deliver program to shipyard for first level testing on new construction destroyers. Continue with integration of CEC Baseline 2 functionality into this baseline. Provide support for CEC DT/OT. Continue preparation for CEC OPEVAL.
- ($29.70) Continue Baseline 6 Phase III computer program code, debugging, and testing. Conduct Critical Design Review (CDR) II. Begin extensive ET&E and MEIT at the Combat System Engineering Development Site (CSEDS).
- ($34.75) Continue system engineering 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.
- ($17.00) Start system definition and engineering for the AEGIS Cruiser Conversion Program to incorporate warfighting capabilities including TBMD, AADC, and land attack into Baseline 2, 3, and 4 Cruisers. This includes computer program modifications.
- ($8.00) Field an AADC User Operational Evaluation System.
- ($7.20) 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.

FY 1999 PLAN (Continued)

- ($15.52) Provides funds for labs and field activities to support forward fit baseline upgrade in order to conduct engineering and scientific studies and analysis to minimize the risk in the introduction of increased warfighting capability including TBMD, CEC, ESSM, and AIEWS into the AEGIS Combat System. Studies produced by the Applied Physics Lab and the Naval Surface Warfare Center, Dahlgren Division (NSWC, DD) ensure effective introduction of

Exhibit R-2a, RDT&E Project Justification		Date: FEBRUARY 1999
RDT&E 1319, Budget Activity 5	AEGIS Combat System Engineering, PE0604307	Surface Combatants Combat System Improvements, K1447 CEC Integration on DDG-51 Ships, K2636 AEGIS Baseline Software Development, K2637

Commercial Off the Shelf Technology (COTS). NSWC, DD personnel also provide on site technical support at contractor facilities during development, testing, and evaluation of upgrades to the AEGIS Combat System.

- ($3.46) Portion of extramural program is reserved for Small Business Innovation Research assessment in accordance with 15 USC 638.

FY 2000 PLAN:

- ($1.20) Continue modifications to the AWS computer program to allow incorporation of AAW capability into the SM2 BLK IVA missile.
- ($32.50) Complete ET&E and MEIT and conduct demonstration of Baseline 6 Phase I. Deliver program to shipyards for final testing in new construction destroyers. Continue with system testing of program for certification for fleet-wide use for destroyers. Support CEC OPEVAL on CGs 66 and 69.
- ($62.20) Continue with extensive Baseline 6 Phase III ET&E and MEIT at CSEDS and the Production Test Center (PTC). Deliver program to shipyards for AWS testing in new construction ships.
- ($43.35) Conduct Critical Design Review (CDR) and begin code, debug and test (CDT) for 7 Phase I computer program. Develop radar handbook and technical manuals associated with introduction of SPY-1D(V) radar.
- ($28.40) Begin System Design Review for the Cruiser Conversion Program to incorporate warfighting capabilities including TBMD, AADC, and land attack into Baseline 2, 3, and 4 Cruisers. This includes computer program modifications.
- ($1.00) Finish integrating modifications to the AADC User Operational Evaluation System (UOES).
- ($8.00) 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.
- ($16.36) Provides funds for labs and field activities to support forward fit baseline upgrade in order to conduct engineering and scientific studies and analysis to minimize the risk in the introduction of increased warfighting capability including TBMD, CEC, ESSM, and AIEWS into the AEGIS Combat System. Studies produced by the Applied Physics Lab and the Naval Surface Warfare Center, Dahlgren Division (NSWC, DD) ensure effective introduction of Commercial Off the Shelf Technology (COTS). NSWC, DD personnel also provide on site technical support at contractor facilities during development, testing, and evaluation of upgrades to the AEGIS Combat System.

- B. Other Program Funding Summary:

	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Complete	Total Cost
SCN LI2122 DDG-51	3,355.00	2,659.00	2,681.70	2,843.70	2,619.70	3,081.10	0.00	0.00	CONT.	CONT.
OPN LI5246	23.00	93.80	86.70	71.70	167.60	303.30	386.50	458.70	N/A.	1,591.30

Exhibit R-2a, RDT&E Project Justification			Date: FEBRUARY 1999
RDT&E 1319, Budget Activity 5	AEGIS Combat System Engineering, PE0604307	Surface Combatants Combat System Improvements, K1447 CEC Integration on DDG-51 Ships, K2636 AEGIS Baseline Software Development, K2637	

AEGIS Supt Eqp

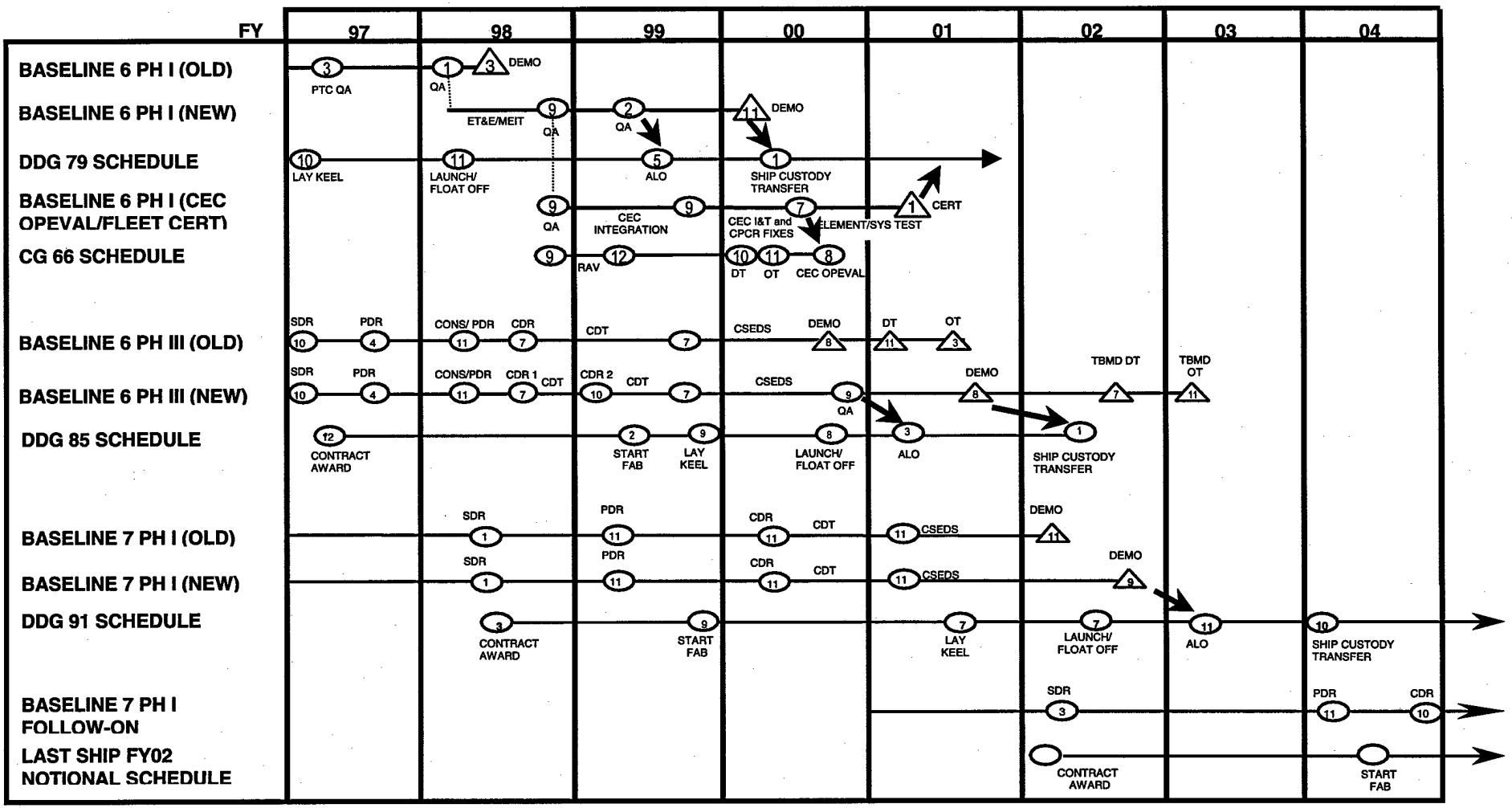
Related RDT&E:

PE 0604867C (Navy Area Missile Defense-EMD)
PE 0603382N (Advanced Combat System Technology)
PE 0603868C (Navy Theater Wide Missile Defense)
PE 0603658N (Cooperative Engagement Capability)
PE 0604755N (Ship Self Defense)
PE 0604366N (Standard Missile Improvements)

C. Acquisition Strategy: Combat System Improvements are implemented in Baselines as described in the project mission statement. In FY 1998, Lockheed Martin was awarded a five year omnibus contract (sole source) to develop and integrate combat system improvements, which will fund all remaining AEGIS Baseline Upgrade Development efforts. After the baseline has been completed and tested, the computer program and associated equipment are delivered to the new construction shipbuilders where the program and equipment are installed and tested along with all other elements of the shipboard combat system and associated combat support systems. The computer program is a GFE deliverable to the Production Test Center for equipment test and check out.

D. Schedule Profile: See following page.

Exhibit R-2a, RDT&E Project Justification		Date: FEBRUARY 1999
RDT&E 1319, Budget Activity 5	AEGIS Combat System Engineering, PE0604307	Surface Combatants Combat System Improvements, K1447 CEC Integration on DDG-51 Ships, K2636 AEGIS Baseline Software Development, K2637



NOTE: IOC = SHIP CUSTODY TRANSFER (SCT)

Exhibit R-3 Cost Analysis		Date: FEBRUARY 1999
RDT&E 1319, Budget Activity 5	AEGIS Combat System Engineering, PE0604307	Surface Combatants Combat System Improvements, K1447 CEC Integration on DDG-51 Ships, K2636 AEGIS Baseline Software Development, K2637

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date			Cost To Complete	Total Cost	Target Value of Contract
Ancillary Hardware Development	SS/CPAF	Lockheed Martin, Moorestown, NJ	0.00	0.59		1.70				CONT.	CONT.	CONT.
Systems Engineering	SS/CPAF	Lockheed Martin, Moorestown, NJ	295.68	75.94	3/95	119.57	3/95			CONT.	CONT.	CONT.
	SS/CPFF	Applied Physics Lab, Baltimore, MD	19.62	17.42	10/96	3.40	10/96			CONT.	CONT.	CONT.
	WR	Naval Surface Warfare Ctr, Dahlgren, VA	33.59	39.58	12/98	38.41	12/99			CONT.	CONT.	CONT.
	WR	Naval Surface Warfare Ctr, Port Hueneme, CA	0.00	4.40	N/A	5.15	12/99			CONT.	CONT.	CONT.
	SS/CPAF	Planning Consultants, Inc., VA Beach, VA	0.00	2.34	3/97	1.97	3/97			CONT.	CONT.	CONT.
	SS/CPAF	Tracor, Rockville, MD	20.12	1.71	3/97	1.72	3/97			CONT.	CONT.	CONT.
	SS/CPAF	Ingalls Planning Yard, Pascagoula, MS	0.00	2.53	3/99	0.00	N/A			CONT.	CONT.	CONT.
Miscellaneous			30.54	0.00		1.00				CONT.	CONT.	CONT
Tooling Miscellaneous			0.00	0.05		0.11				CONT.	CONT.	CONT.

Exhibit R-3 Cost Analysis		Date: FEBRUARY 1999
RDT&E 1319, Budget Activity 5	AEGIS Combat System Engineering, PE0604307	Surface Combatants Combat System Improvements, K1447 CEC Integration on DDG-51 Ships, K2636 AEGIS Baseline Software Development, K2637

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date			Cost To Complete	Total Cost	Target Value of Contract
Award Fees	SS/CPAF	Lockheed Martin, Moorestown, NJ	41.14	10.17		15.63				CONT.	CONT.	CONT.
Miscellaneous			2.79	0.45		0.51				CONT.	CONT.	CONT.
Configuration Management Miscellaneous				0.40		0.00				CONT.	CONT.	CONT.
Subtotal Product Development			443.95	155.58		189.17				CONT.	CONT.	CONT.
Software Development Miscellaneous			0.47	0.27		0.30				CONT.	CONT.	CONT.
Travel Miscellaneous			0.61	0.35		0.36				CONT.	CONT.	CONT.
Integrated Logistics Support Miscellaneous			0.70	0.40		0.40				CONT.	CONT.	CONT.
Configuration Management Miscellaneous			0.65	0.38		0.18				CONT.	CONT.	CONT.
Technical Data	SS/CPAF	Lockheed Martin, Moorestown, NJ		0.73		1.23				CONT.	CONT.	CONT.
Miscellaneous			1.45	0.00		0.06				CONT.	CONT.	CONT.
Award Fees Miscellaneous			0.00	0.10		0.17				CONT.	CONT.	CONT.
Subtotal Support			3.88	2.23		2.70				CONT.	CONT.	CONT.

Exhibit R-3 Cost Analysis		Date: FEBRUARY 1999
RDT&E 1319, Budget Activity 5	AEGIS Combat System Engineering, PE0604307	Surface Combatants Combat System Improvements, K1447 CEC Integration on DDG-51 Ships, K2636 AEGIS Baseline Software Development, K2637

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date			Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation Miscellaneous			1.05	0.14		0.00				CONT.	CONT.	CONT.
Operational Test & Evaluation Miscellaneous			4.41	0.59		0.90				CONT.	CONT.	CONT.
Subtotal T&E			5.46	0.73		0.90				CONT.	CONT.	CONT.
Program Management Support Miscellaneous			3.90	0.29		0.24				CONT.	CONT.	CONT.
Subtotal Management			3.90	0.29		0.24				CONT.	CONT.	CONT.
Total Cost			431.22	158.83		193.01				CONT.	CONT.	CONT.

Exhibit R-2a, RDT&E Project Justification			Date: FEBRUARY 1999
RDT&E 1319/Budget Activity 5	AEGIS Combat System Engineering, PE0604307N	Surface Combatant Weapon System Mod, K1776	

Cost ($ in Millions)	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Project Cost	5.43	7.19	4.21	4.26	4.32	4.40	4.49	4.58	CONT.	CONT.
RDT&E Articles Qty	Not applicable.									

A. 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.

FY 1998 ACCOMPLISHMENTS:

- ($1.45) Continued AN/SPY-1 Signal Processor upgrade efforts (Tactical Environmental Processor (TEP), Signal Processor Over Temperature, and Qualification test improvements). Began to design and develop changes to the Electronic Counter Measures Analysis (ECMA) function to enhance AN/SPY-1B/D Signal Processor performance.
- ($1.60) Continued SPY-1 mods. Began system studies and analysis for TEP enhancements.
- ($0.40) Continued Operational Readiness Test System (ORTS) Upgrade for Baseline 3, 4, and 5 design, development, and engineering.
- ($1.98) Provided 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 on one-time basis.

FY 1999 PLAN:

- ($1.81) Continue AN/SPY-1 Signal Processor upgrade efforts (TEP, Signal Processor Over Temperature, and Qualification test improvements). Continue to design and develop changes to the Electronic Counter Measures Analysis (ECMA) function to enhance AN/SPY-1B/D Signal Processor performance.
- ($3.15) Continue SPY-1 mods and TIP enhancements.
- ($1.37) Continue Operational Readiness Test System (ORTS) Upgrade for Baseline 3, 4, and 5 design, development, and engineering.
- ($0.71) Initiate requirements definition for Common Moving Target Indicator (MTI)/TBMD processor
- ($0.15) Portion of extramural program is reserved for Small Business Innovation Research assessment in accordance with 15 USC 638.

FY 2000 PLAN:

Exhibit R-2a, RDT&E Project Justification		Date: FEBRUARY 1999
RDT&E 1319/Budget Activity 5	AEGIS Combat System Engineering, PE0604307N	Surface Combatant Weapon System Mod, K1776

- ($1.69) Continue SPY-1 mods and TEP enhancements.
- ($0.40) Continue Operational Readiness Test System (ORTS) Upgrade for Baseline 3, 4, and 5 design, development, and engineering.
- ($2.12) Continue requirements definition for Common MTI/TBMD processor.

B. Other Program Funding Summary:

	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Complete	Cost
OPN LI5246 AEGIS Supt Eqp	23.00	93.80	86.70	71.70	167.60	303.30	386.50	458.70	CONT.	1,591.13

Related RDT&E: Not applicable.

C. Acquisition Strategy: Lockheed Martin is the sole producer of the AEGIS Weapon System (AWS) except for the AN/SPY-1 Radar transmitter and the MK 99 CWI transmitter and illuminator which are produced by Raytheon. It is anticipated that all AWS modifications will be procured from the original equipment manufacturer.

Exhibit R-2a, RDT&E Project Justification			Date: FEBRUARY 1999
RDT&E 1319/Budget Activity 5	AEGIS Combat System Engineering, PE0604307N	Surface Combatant Weapon System Mod, K1776	

D. Schedule Profile

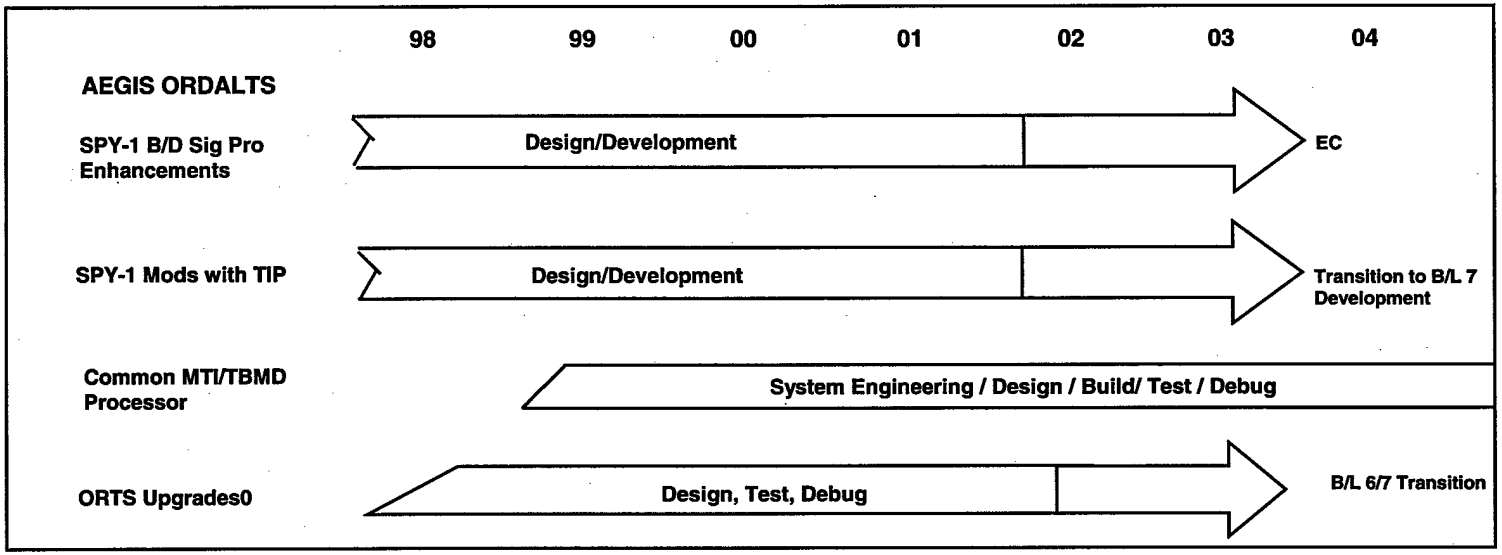


Exhibit R-3 Cost Analysis		Date: FEBRUARY 1999
RDT&E 1319, Budget Activity 5	AEGIS Combat System Engineering, PE0604307	Surface Combatant Weapon System Mod, K1776

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date			Cost To Complete	Total Cost	Target Value of Contract
Ancillary Hardware Development												
Miscellaneous			0.00	0.60		0.00				CONT.	CONT.	CONT.
Systems Engineering	SS/CPAF	Lockheed Martin/ Moorestown, NJ	16.80	1.83	3/95	2.46	3/95			CONT.	CONT.	CONT.
Miscellaneous			3.76	1.69		0.83				CONT.	CONT.	CONT.
Configuration Management												
Miscellaneous			0.00	0.00		0.40				CONT.	CONT.	CONT.
Software Development												
Miscellaneous			0.00	0.35		0.00				CONT.	CONT.	CONT.
Technical Data												
Miscellaneous			0.00	0.30		0.00				CONT.	CONT.	CONT.
Award Fees												
Miscellaneous			2.34	0.30		0.39				CONT.	CONT.	CONT.
Subtotal Product Development			22.90	5.07		4.08				CONT.	CONT.	CONT.
Training Development												
Miscellaneous			0.20	0.32		0.00				CONT.	CONT.	CONT.
Configuration Management												
Miscellaneous			0.22	0.35		0.00				CONT.	CONT.	CONT.
Technical Data												
Miscellaneous			0.56	0.88		0.13				CONT.	CONT.	CONT.
Award Fee												
Miscellaneous			0.08	0.12		0.00				CONT.	CONT.	CONT.
Subtotal Support			1.06	1.67		0.13				CONT.	CONT.	CONT.

Exhibit R-3 Cost Analysis		Date: FEBRUARY 1999
RDT&E 1319, Budget Activity 5	AEGIS Combat System Engineering, PE0604307	Surface Combatant Weapon System Mod, K1776

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date			Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation Micellaneous			0.00	0.45		0.00				CONT.	CONT.	CONT.
Subtotal T&E			0.00	0.45		0.00				CONT.	CONT.	CONT.
Subtotal Management	Not applicable.											
Total Cost			23.96	7.19		4.21				CONT.	CONT.	CONT.

Exhibit R-2a, RDT&E Project Justification			Date: FEBRUARY 1999
RDT&E 1319/Budget Activity 5	AEGIS Combat System Engineering PE0604307N	Surface Combatant Weapons Development, K1937	

Cost ($ in Millions)	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Project Cost	0.00	6.86	7.24	0.97	0.01	0.01	0.02	0.02	CONT.	CONT.
RDT&E Articles Qty	Not applicable.									

A. 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. The changes are in the transmitter, signal processor, and radar control computer. Two new efforts will start in FY 1999:

- Development of the AAW requirements and design for a common signal processor (CSP) which builds upon the risk reduction test beds being developed for Navy Theater Wide (NTW) defense under BMDO funding. This NTW CSP is required to provide exo-atmospheric discrimination capability. The common signal processor effort will incorporate AAW functions into the signal processor functions being developed for NTW.
- Integration of the AN/SPQ-9B radar into the AEGIS Weapon System to improve capability against the advanced low-altitude threat.

FY 1998 ACCOMPLISHMENTS: Not applicable.

FY 1999 PLAN:

- ($2.94) 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 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 Electronic counter-countermeasures (ECCM) capabilities.
- ($3.76) Initiate the design for the integration of the AN/SPQ-9B Radar (or its advanced variant) in the AEGIS Weapon System. The design will include both AAW and Gun Weapons System (GWS) integration schemes and will seek to free-up AN/SPY-1 horizon search resources for above horizon search (i.e. TBMD).
- ($0.16) Portion of extramural program is reserved for Small Business Innovation Research assessment in accordance with 15 USC 638.

FY 2000 PLAN:

- ($3.74) Continue the design of the expanded common signal processor for the AN/SPY-1 Radar to include advanced AAW functionality which will improve low altitude clutter rejection and ECCM performance.
- ($3.50) Complete the design for the integration of the AN/SPQ-9B into the AEGIS Weapon System.

Exhibit R-2a, RDT&E Project Justification			Date: FEBRUARY 1999
RDT&E 1319/Budget Activity 5	AEGIS Combat System Engineering PE0604307N	Surface Combatant Weapons Development, K1937	

B. Other Program Funding Summary:

	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Complete	Total Cost
SCN LI2122 DDG-51	3,355.00	2,672.08	2,729.43	2,714.85	2,691.12	3,164.99	0.00	0.00	CONT.	CONT.

Related RDT&E: Not applicable.

C. Acquisition Strategy:

- AN/SPQ-9B Integration: Lockheed Martin (LM) is the AEGIS Combat System Engineering Agent and is the sole producer of AEGIS Weapon System (AWS) modifications. It is anticipated that all modifications needed to fully integrate the AN/SPQ-9B into the AWS will be procured from LM.
- Common Signal Processor: As the sole producer of the AN/SPY-1 Radar, LM is taking the lead in AN/SPY-1 signal processor TBMD test bed efforts. LM will be the prime for the development of the common signal processor with advanced AAW functionality, which will be built off of TBMD common signal processor efforts. Some of the portions of the development may be assigned to laboratories. Procurement of the common signal processor will be with LM.

Exhibit R-2a, RDT&E Project Justification			Date: FEBRUARY 1999
RDT&E 1319/Budget Activity 5	AEGIS Combat System Engineering PE0604307N	Surface Combatant Weapons Development, K1937	

D. Schedule Profile:

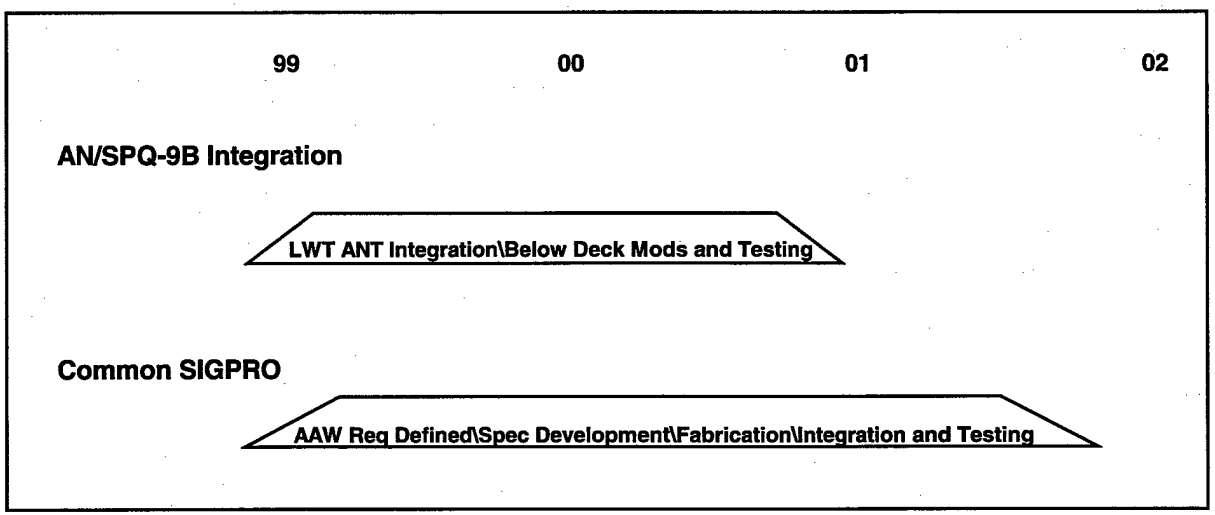


Exhibit R-3 Cost Analysis		Date: FEBRUARY 1999
RDT&E 1319/Budget Activity 5	AEGIS Combat System Engineering PE0604307N	Surface Combatant Weapons Development, K1937

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date			Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	SS/CPAF	Lockheed Martin/Moorestown, NJ	157.93	2.24	3/95	4.33	3/95			CONT.	CONT.	CONT.
	WR	Naval Surface Warfare Ctr, Dahlgren, VA	0.00	1.50	12/98	1.50	12/99			CONT.	CONT.	CONT.
Miscellaneous			0.00	0.77		0.77				CONT.	CONT.	CONT.
Award Fees Miscellaneous			21.94	0.35		0.64				CONT.	CONT.	CONT.
Subtotal Product Development			179.87	4.86		7.24				CONT.	CONT.	CONT.
Technical Data	SS/CPAF	Lockheed Martin, Moorestown, NJ	0.00	2.00	3/95	0.00	3/95			CONT.	CONT.	CONT.
Subtotal Support			0.00	2.00		0.00				CONT.	CONT.	CONT.
Subtotal T&E	Not applicable.											
Subtotal Management	Not applicable.											
Total Cost			179.87	6.86		7.24				CONT.	CONT.	CONT.

FY 2000 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: FEBRUARY 1999

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604310N PROJECT NUMBER: S2294
PROGRAM ELEMENT TITLE: Arsenal Ship PROJECT TITLE: Arsenal Ship Development

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
S2294 Arsenal Ship Development	13,020	0	0	0	0	0	0	13,020

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Arsenal Ship project has two major phases: (1) development of a Demonstrator Ship using R&D funds and (2) a subsequent SCN-funded program. The Demonstrator Ship is a prototype used to establish the "proof-of-principle" for high fire-power, low manning strike mission ships. The Chief of Naval Operations has directed that the Demonstrator Ship start at-sea testing prior to award of the first SCN ship. The schedule requires a Functional Design phase in FY 1997. Detail Design and Construction starting in FY 1998, and at-sea tests and trials starting in FY 2000. Initial concept development was funded in PE 0603563N, S2196 in FY 96. Congress appropriated the FY 97 funding under BA 4, PE 0603852N. Funding for FY98 and later are designated BA 5, PE 0604310N.

(U) JUSTIFICATION FOR BUDGET ACTIVITY. This program is funded under ENGINEERING & MANUFACTURING DEVELOPMENT because it will develop and integrate hardware for experimental test related to specific ship or aircraft applications. The program will test the ship's readiness for transition to full production.

FY 2000 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: FEBRUARY 1999

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604310N PROJECT NUMBER: S2294
PROGRAM ELEMENT TITLE: Arsenal Ship PROJECT TITLE: Arsenal Ship Development

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1998 Accomplishments:
(U) ($13,020) Close-out of contracts and development of lessons learned.

3. (U) FY 1999 PLAN:
PROGRAM TERMINATED NOV 97

FY 2000 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: FEBRUARY 1999

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604310N PROJECT NUMBER: S2294
PROGRAM ELEMENT TITLE: Arsenal Ship PROJECT TITLE: Arsenal Ship Development

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1998
(U) FY 1998 President's Budget:	13,462
(U) Appropriated Value	13,462
(U) Adjustments to Appropriated Value/ FY 1998 President's Budget:	-442
a. Minor Pricing Adjustments	
(U) FY 2000 PRES Budget Submit:	13,020

(U) CHANGE SUMMARY EXPLANATION:
(U) Funding: FY 1998 reductions due to minor pricing adjustments.
(U) Schedule: Not applicable.
(U) Technical: Not applicable

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

FY 2000 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: FEBRUARY 1999

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604310N PROJECT NUMBER: S2294
PROGRAM ELEMENT TITLE: Arsenal Ship PROJECT TITLE: Arsenal Ship Development

D. (U) SCHEDULE PROFILE:

	FY 1998
Program Milestones	(Not Applicable - Non-Acquisition Program)
Engineering Milestones	Complete Func Designs - 1Q
T&E Milestones	TBD
Contract Milestones	Award Detail Design and Ship Construction - 2Q

Exhibit R-2, RDT&E Project Justification		Date February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E, BA5	Program Element Name and Number: LPD 17 Class Systems Integration - 0604311N	Project Name and Number: LPD 17 Class Systems Integration 22283/22425

COST ($ in Millions)	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Total P.E. Cost	13.743	1.340	2.608	0.283	1.023	10.330	10.543	10.762	CONT.	CONT.
LPD 17 Class Systems Integration/22283	1.483	1.340	2.608	0.283	1.023	10.330	10.543	10.762	CONT.	CONT.
LPD 17 Class Systems Integration/22425	12.260	0	0	0	0	0	0	0	0	12.260
Quantity of RDT&E Articles & cost	0	0	0	0	0	0	0	0	0	0

A. 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 that began in FY 1997 developed further reductions in life cycle costs and integrated 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 reductions 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 system integration design packages that provide technical baselines for follow-on ship procurements. In addition, these efforts include the Live Fire Test & Evaluation (LFT&E) and Operational Evaluation (OPEVAL) tests required for the lead ship. 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:

FY 1998 Accomplishments:

• (U) (13.743) Continued naval expeditionary warfare systems engineering efforts. Reviewed latest operational requirements. Continued live fire test and operational evaluation efforts. Began update of ship specifications for 1Q/FY00 follow ship contract award. Completed development of total ownership cost reduction initiatives.

FY 1999 Plan:

• (U) (1.0) Continue naval expeditionary warfare systems engineering efforts. Continue live fire test and operational evaluation efforts. Finalize update to the ship specifications for 1Q/FY00 follow ship contract award.

(U) (.34) Portion of extramural program is reserved for Small Business Innovation Research assessment in accordance with 15 USC 638.

FY 2000 Plan:

• (U) (2.608) Continue naval expeditionary warfare systems engineering efforts. Continue live fire test and operational evaluation efforts.

Exhibit R-2, RDT&E Project Justification		Date February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E, BA5	Program Element Name and Number: LPD 17 Class Systems Integration - 0604311N	Project Name and Number: LPD 17 Class Systems Integration 22283/22425

B. Program Change Summary:

	FY 1998	FY 1999	FY 2000
FY 1999 President's Budget:	13.944	1.343	2.651
Appropriated Value:	13.471	1.343	2.651
Adjustment to FY 1998 Appropriated Value/ Adjustment to FY 1999 President's Budget:	+ .272	- .003	- .043
FY 2000 PRES Budget Submit:	13.743	1.340	2.608

Funding: FY98, FY99 and FY2000 changes due to minor pricing adjustments.
Schedule: Not applicable.

Technical: Not applicable.

C. Other Program Funding Summary ($ in millions)

	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Complete	Total Cost
SCN Line 3036	96	681	1,508	1,509	1,500	1,578	1,886	1,538	0	10,296

RELATED RDT&E:
PE 0604567N Ship Contract Design/Live Fire T&E

D. Acquisition Strategy: Competitive

E. Schedule Profile:

Exhibit R-2, RDT&E Project Justification			Date February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E, BA5	Program Element Name and Number: LPD 17 Class Systems Integration - 0604311N	Project Name and Number: LPD 17 Class Systems Integration 22283/22425	

	FY 1998	FY 1999	FY 2000
Program Milestones		4Q Program Review	
Engineering Milestones	4Q Continue Detail Design	3Q Complete Specifications Update	
T&E Milestones	4Q DT-IIA	2Q OT-IC	
Contract Milestones			1Q Second Contract Award

Exhibit R-3 Cost Analysis		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E, BA5	PROGRAM ELEMENT NAME AND NUMBER LPD 17 Class Systems Integration - 0604311N	PROJECT NAME AND NUMBER LPD 17 Class Systems Integration 22283/22425

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date	FY01 Cost	FY01 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering & Integration	Various	Various	16.954	0.540	Nov 98	1.008	Nov 99			CONT.	CONT.	
Subtotal Product Development			16.954	0.540		1.008				CONT.	CONT.	
Remarks:												
Development Support Equipment												
Software Development												
Training Development												
Integrated Logistics Support												
Configuration Management												
Technical Data												
GFE												
Subtotal Support												
Remarks: Not Applicable.												

Exhibit R-3 Cost Analysis		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E, BA5	PROGRAM ELEMENT NAME AND NUMBER LPD 17 Class Systems Integration - 0604311N	PROJECT NAME AND NUMBER LPD 17 Class Systems Integration 22283/22425

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date	FY01 Cost	FY01 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Test & Evaluation	Various	Various	0.850	0.800	Nov 98	1.600	Nov 99			CONT.	CONT.	
Subtotal T&E			0.850	0.800		1.600				CONT.	CONT.	
Remarks:												
Contractor Engineering Support												
Government Engineering Support												
Program Management Support												
Program Management Personnel												
Travel												
Labor (Research Personnel)												
Overhead												
Subtotal Management												
Remarks: Not Applicable												
Total Cost	Various	Miscellaneous	17.804	1.340		2.608				CONT.	CONT.	
Remarks:												

DATE: February 1999

BUDGET ACTIVITY: 05

PROGRAM ELEMENT: 0604312N
PROGRAM ELEMENT TITLE: Tri-Service Standoff Attack Missile (TSSAM)

(U) COST: (Dollars in Thousands)

Project Number & Title	FY 1998 Actuals	FY 1999 Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete	Total Program
E2242 Joint Air to Surface Standoff Missile (JASSM)										
TOTAL	**5,251**	**2,055**	**2,020**	**2,036**	**2,037**	**2,027**	**2,084**	**2,136**	**Cont**	**Cont**
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. 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, C/D, F-14, S-3, and P-3 are currently designated as Navy objective platforms for JASSM. Carrier Operability is one of the Key Performance Parameters (KPP) for JASSM. The FY98-05 Navy budget covers only the cost of Navy unique testing required to meet the Carrier Operability KPP.

*Note Project number has changed from A2242 to E2242.

DATE: February 1999

BUDGET ACTIVITY: 05 **PROGRAM ELEMENT: 0604312N** **PROGRAM ELEMENT TITLE: TSSAM** **PROJECT NUMBER: E2242** **PROJECT TITLE: JASSM**

(U) COST: (Dollars in Thousands)

Project Number & Title	FY 1998 Budget	FY 1999 Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete	Total Program
TOTAL	**5,251**	**2,055**	**2,020**	**2,036**	**2,037**	**2,027**	**2,084**	**2,136**	**Cont**	**Cont**
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. 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 (TASSM). 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 E/F, C/D, F-14, S-3, and P-3 are currently designated as Navy objective platforms for JASSM. Carrier Operability is one of the Key Performance Parameters (KPP) for JASSM. The FY98-05 Navy budget covers only the cost of Navy unique testing required to meet the Carrier Operability KPP.

*Note Project number has changed from A2242 to E2242.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. FY 1998 ACCOMPLISHMENTS:

- (U) ($0 - Air Force funded) Downselect to single JASSM contractor—Lockheed Martin (9 Apr 98). Complete PDRR.
- (U) ($1,900) SLAM-ER CARD development and efforts for SLAM-ER participation in JASSM Analysis of Alternatives (AOA).
- (U) ($3,351) Carrier operability and ship suitability testing and AOA participation.

DATE: February 1999

BUDGET ACTIVITY: 05 **PROGRAM ELEMENT: 0604312N** **PROJECT NUMBER: E2242**
PROGRAM ELEMENT TITLE: TSSAM **PROJECT TITLE: JASSM**

2. (U) FY 1999 PLAN:

- (U) ($2,038) Continue carrier operability and ship suitability testing requirements.
  (U) ($ 17) Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15 USC 638.

3. (U) FY 2000 PLAN:

- (U) ($2,020) Continue carrier operability and ship suitability testing requirements.

DATE: February 1999

BUDGET ACTIVITY: 05 **PROGRAM ELEMENT: 0604312N** **PROGRAM ELEMENT TITLE: TSSAM** **PROJECT NUMBER: E2242** **PROJECT TITLE: JASSM**

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1998	FY 1999	FY 2000
(U) FY 1999 President's Budget:	+3,794	+2,064	+2,056
(U) Appropriated Value:	5,456	2,064	
(U) Adjustments from 1999 Pres Budget:	+1,457	-9	-36
(U) FY 2000/2001 President's Budget Submit:	5,251	2,055	2,020

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY 1998 net increase of $1,457 reflects an increase of $1,500 for Catapult and Trap testing to satisfy the Carrier Operability KPP and a decrease of $43 reflects a reprioritization of requirements. The FY 1999 and FY 2000 adjustment reflects minor inflation adjustments.

(U) Schedule: All schedules are JASSM program, not Navy specific. EMD began in Nov 1998 as scheduled; however, the Milestone II decision extends the EMD program by six months. EMD is now 40 months (was 34 months); Low Rate Initial Production (LRIP) decision now Jan 2001 (was July 2000); Milestone III now July 2002 (was January 2002).

(U) Technical: All technical changes are JASSM program, not Navy specific. Risk reduction activities resulting from the six-month extension to EMD include additional ground test, captive flight test, modeling, and simulation. In addition, JASSM mission planning software will migrate from the Combat Intelligence System (CIS) to Theater Battle Management Core System (TBMCS) which is replacing CIS.

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

Appn	FY 1998 Actual	FY 1999 Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	TO Complete	TOTAL Program
USAF,PAAF	0	0	0	52,290	52,564	106,582	145,451	152,044	688,654	1,197,585

USAF, RDT&E: U.S. Air Force P.E. 0207325F (Joint Air to Surface Standoff Missile (JASSM))

FY 1998 Actual	FY 1999 Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete	Total Program
163,801	125,839	166,408	71,022	53,578	21,057	9,224	6,052	0	805,273

DATE: February 1999

BUDGET ACTIVITY: 05 **PROGRAM ELEMENT: 0604312N** **PROGRAM ELEMENT TITLE: TSSAM** **PROJECT NUMBER: E2242** **PROJECT TITLE: JASSM**

(U) D. ACQUISITION STRATEGY:

(U) E. SCHEDULE PROFILE

	FY 1998	FY 1999	FY 2000	TO COMPLETE
Program Milestones		1Q/MSII		2Q/LRIP
Engineering Milestones				
T&E Milestones				
Contract Milestones		1Q/EMD		

All milestone activities reflect JASSM programatic milestones, not Navy specific events.
*LRIP quantities funded by USAF.

EXHIBIT R-3, FY 2000/2001 RDT&E,N COST ANALYSIS DATE: February 1999

BUDGET ACTIVITY: 05 PROGRAM ELEMENT: 0604321N PROJECT NUMBER: E2242
PROJECT TITLE: JASSM

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	Cost to Complete	Total Cost	Target Value of Contract
a) Product Development										
JASSM ANALYSIS OF ALTERNATIVES (AoA)/CARRIER OPERABILITY-SHIP SUITABILITY	WX	NAWC-WD	1,193	1,136	10/01/98	425	10/01/99	CONT	CONT	
SLAM-ER CARD DEV TO SUPT JASSM AoA	WX	NAWC-WD	300	0	N/A	0	N/A	0	300	
SLAM-ER/JASSM AoA SUPT.	SS/CPFF	BOEING	1,600	0	N/A	0	N/A	0	1,600	1600
CARRIER OPERABILITY/SHIP SUITABILITY TESTING	Misc	JASSM	2,158	919	Misc	1,595	Misc	CONT	CONT	
Subtotal Product Development			5,251	2,055		2,020		CONT	CONT	

Remarks: Work performed by PMA-258 was a one-time resource sponsor directed action for increased Navy participation in the JASSM Analysis of Alternatives process. PMA-258 conducted comparative anaylsis between JASSM and SLAM-ER. All efforts reflected in Product Development are in support of Carrier Operability development. This effort is Navy unique. All other JASSM efforts are being funded by the Air Force as the executive service. No aircraft integration efforts are funded in this line.

b. Support	None						
Subtotal Support		0	0	0	0	0	
Remarks:							
c. Test & Evaluation	None						
Subtotal Test & Evaluation		0	0	0	0	0	
Remarks:							
d. Management	None						
Subtotal Management		0	0	0	0	0	
Remarks:							
Total Cost		5,251	2,055	2,020	CONT	CONT	

Exhibit R-2, RDT&E Budget Item Justification								Date: February 1999		
APPROPRIATION/BUDGET ACTIVITY RDT&E,N /B.A.-5					R-1 ITEM NOMENCLATURE Program Element (PE) Name and No. VERTICAL LAUNCH ASROC/0604355N					
COST ($ in Millions)	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Total P.E. Cost	8.488	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	8.488
Vertical Launch ASROC /V1504	8.488	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	8.488
Quantity of RDT&E Articles & cost										

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

The funding is to complete engineering design changes to the Vertical Launch Anti-Submarine Rocket (VLA) missile and existing fire control and vertical launching systems on the design platforms to accommodate the Lightweight Hybrid Torpedo as a VLA payload variant. Integration of the VLA and Lightweight Hybrid Torpedo will provide additional stand-off capability in littoral, shallow-water, countermeasure filled environments. The engineering design technical initiative was awarded to Lockheed Martin Tactical Defense Systems in July 1998.

1. (U) FY 1998 ACCOMPLISMENTS:

   - (U) ($3.910) Completed the engineering change design development and component confidence and qualification testing to verify design changes. Completed Preliminary Drawing Review (PDR), Comprehensive Design Review (CDR) and Final Design Review.
   - (U) ($0.631) Completed the software development efforts for existing fire control systems that will provide interface capability with the VLA Lightweight Hybrid Torpedo payload variant.
   - (U) ($2.297) Completed the engineering change designs to existing Vertical Launching Systems canisters and test sets to accommodate the VLA Lightweight Hybrid Torpedo payload variant.
   - (U) ($1.650) Completed test and analysis of VLA engineering design and component performance data in support of program requirements.

2. (U) FY 1999 PLAN: Not Applicable.

3. (U) FY 2000 PLAN: Not Applicable

Exhibit R-2, RDT&E Budget Item Justification	Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E,N /B.A.-5	R-1 ITEM NOMENCLATURE Program Element (PE) Name and No. VERTICAL LAUNCH ASROC/0604355N

B. (U) Program Change Summary: ($ in millions)

	FY 1998	FY 1999	FY 2000
(U) FY 1999 President's Budget:	8.733		
(U) Appropriated Value:	9.000		
Adjustments to FY 1998 Appropriated Value/FY 1999 President's Budget:	-0.512		
(U) FY 2000 PRES Budget Submit:	8.488		

(U) Funding: FY98: $0.512M reduction due to $0.267 in general R&D and economic assumptions reductions and $0.245M Small Business Innovation Research (SBIR) reduction.
FY99: Not Applicable
FY00: Not Applicable.

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

C. (U) Other Program Funding Summary ($ in millions)

	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Complete	Total Cost
Vertical Launch ASROC (WPN / PE 0204228N/ BA3 / BL Item 314500)	0.000	0.000	0.000	0.000	0.000	1.764	1.498	1.526	0.000	4.788
Torpedo MK46 MODS (WPN / PE 0204228N/ BA3 / BL Item 321500)	0.000	0.000	28.699	25.204	29.610	35.534	37.833	38.809	296.192	491.881

Note: FY 2000 includes $3.000M for VLA Lightweight Hybrid Torpedo flight integration test efforts.

(U) RELATED RDT&E:

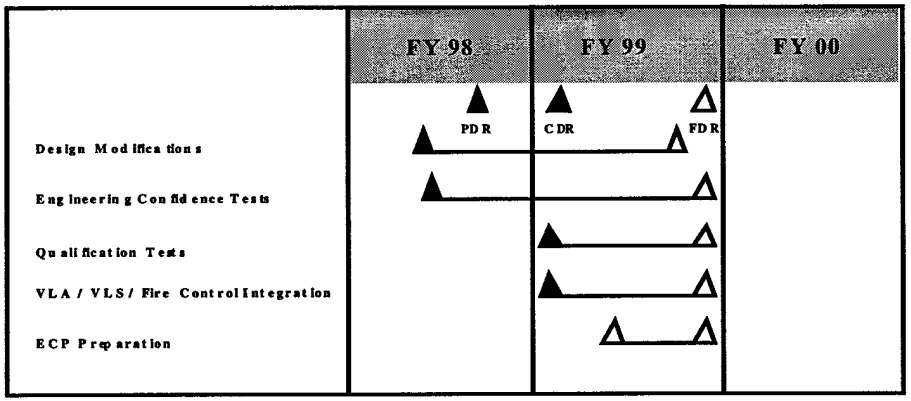
UNCLASSIFIED

Lightweight Torpedo Development (RDT&E,N / PE 0604610N / BA5)									
15.773	7.929	9.297	8.684	7.966	2.895	2.996	1.747	CONT.	CONT.

D. (U) Acquisition Strategy: The engineering design contract is currently held by Lockheed Martin Tactical Defense Systems. In July 1998 the design effort was funded utilizing an engineering services and VLA Lightweight Hybrid Torpedo integration technical instruction.

E. Schedule Profile:

Vertical ASROC Planning Schedule



UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification	Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E,N / BA5	R-1 ITEM NOMENCLATURE STANDARD Missile Improvements / PE 0604366N

COST ($ in Millions)	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Total P.E. Cost	.501	11.291	1.140	1.205	1.329	1.399	1.428	1.458	Continuing	Continuing
STANDARD Missile Improvements/K0439/U0439	.501	1.314	1.140	1.205	1.329	1.399	1.428	1.458	Continuing	Continuing
ADSAM Demonstration /K2639/ U2639	0	4.989	0	0	0	0	0	0	0	4989
Optical Correlators/K2640/U2640	0	4.988	0	0	0	0	0	0	0	4988
Quantity of RDT&E Articles & cost										

A. Mission Description and Budget Item Justification:

(Project U0439) STANDARD Missile fuze and guidance performance degrades when the target is in close proximity to the sea surface. The low altitude improvement program will improve performance against low and very low altitude targets. It will be implemented in two phases: Phase I added a fuze altimeter and trajectory shaping enabling improved target detection to a very low altitude and reduced the effect of multipath on radar returns on guidance performance. Phase II added a moving target indicator (MTI), azimuth sensing fuze, and one other item which greatly improves lethality throughout the SM-2 Block III/IIIA/IIIB engagement envelope and will also improve lethality throughout the SM-2 Block IV engagement envelope. This capability is currently being developed for AEGIS ships. Additionally, an effort will be started to improve performance of the Mk 45 Target Detecting Device (TDD) against advanced threats.

FY 1998 ACCOMPLISHMENTS:

- ($.501) Transition/leverage off the MK45 Mod12 TDD Overland Cruise Missile Defense development.

FY 1999 PLAN:

- ($1.280) Initiate development of TDD Land Attack Cruise Missile Defense Capability. This will improve target clutter discrimination for overland scenarios by implementing changes to MK45 MOD 12 TDD Design.
- ($4.863) Continue development and build a miniturized, ruggedized, STANDARD Missile Optical Correlator Co-Processor.
- ($4.862) Initiate development of the Air Directed Surface–to-Air Missile (ADSAM)
- ($0.286) Portion of extramural program is reserved for Small Business Innovation Research assessment in accordance with 15 USC 638.

FY 2000 PLAN:

- ($1.140) Continue development of Overland Cruise Missile Defense Capability for the MK45 TDD. Begin build-up of integration hardware and planning for flight test.

Exhibit R-2, RDT&E Budget Item Justification	Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E,N / BA5	R-1 ITEM NOMENCLATURE STANDARD Missile Improvements / PE 0604366N

B. Program Change Summary:

	FY 1998	FY 1999	FY 2000
FY 1999 President's Budget:	0.523	1.320	1.276
Appropriated Value	0.549	11.320	
Adjustments to FY 1998 Appropriated Value/ FY 1999 President's Budget			
a. SBIR reduction	-0.015		
b. Congressional undistributed reductions	-0.015		
c. Minor pricing adjustments	-0.018	-0.029	-0.136
d. Congressional program increase		10.000	
FY 2000/01 President's Budget Submit:	0.501	11.291	1.140

Schedule: Not Applicable.
Technical: Not Applicable.

C. Other Program Funding Summary: Not applicable.

FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Complete	Total Cost

D. Acquisition Strategy: Not applicable.

E. Schedule Profile: Not applicable.

Exhibit R-3 Cost Analysis		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E,N/BA 5	PROGRAM ELEMENT NAME AND NUMBER STANDARD Missile Improvements 0604366N	PROJECT NAME AND NUMBER STANDARD Missile Improvements K0439/U0439

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date			Cost To Complete	Total Cost	Target Value of Contract
Design and Analysis	WR	NAWC/China Lake	781.0	1.314	11/98	1.140	11/99			Continuing	Cont.	
	WR	NSWC/Dahlgren		1.500	3/99							
		Raytheon		.500	3/99							
		AOS Inc.		1.000	3/99							
		Litton Inc.		1.988	3/99							
		Cruise Missile Defense Program Office		4.989	3/99							
Subtotal Product Development			781.0	11.291		1.140						
Total Cost				11.291		1.140						
Remarks:												
Development Support Equipment												
Software Development												
Training Development												
Integrated Logistics Support												

Exhibit R-3 Cost Analysis		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E,N/BA 5	PROGRAM ELEMENT NAME AND NUMBER STANDARD Missile Improvements 0604366N	PROJECT NAME AND NUMBER STANDARD Missile Improvements K0439/U0439

Configuration Management												
Technical Data												
GFE												
Subtotal Support (Not applicable)												

	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	Fy00 Cost	FY00 Award Date			Cost To Complete	Total Cost	Target Value of Contract
Development Test and Evaluation												
Operational Test and Evaluation												
Tooling												
GFE												
Subtotal T&E (Not applicable)												
Contractor Engineering Support												
Government Engineering Support												
Program Management Support												
Program Management Personnel												
Travel												
Labor (Research Personnel)												
Overhead												
Subtotal Management (Not applicable)												

Exhibit R-2, RDT&E Budget Item Justification	Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RESEARCH, DEVELOPMENT, TEST& EVALUATION, NAVY/BA-5	R-1 ITEM NOMENCLATURE. Airborne Mine Countermeasures/0604373N

COST ($ in Millions)	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Total P.E. Cost	17.297	30.877	50.642	51.279	56.582	53.293	9.824	0	0	366.780
Airborne Mine Hunt Systems Q0529	15.411	19.844	15.599	17.064	10.011	0	0	0	0	174.915
ALMDS Q2047	0	4.897	19.904	18.272	15.083	21.636	0	0	0	79.792
SWIMS Q2427	1.886	2.146	4.830	7.873	12.792	15.042	0	0	0	44.569
AMNS Q2473	0	1.995	10.309	8.070	18.696	16.615	9.824	0	0	65.509
SWMS Acoustic Projector Q2642	0	1.995	0	0	0	0	0	0	0	1.995
Quantity of RDT&E Articles & Cost										

A. 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. 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. Program Change Summary:

	FY 1998	FY 1999	FY 2000
FY 1999 President's Budget:	17.905	24.967	23.644
Appropriated Value:	17.905	30.877	
Adjustment to FY 1998 Appropriated Value/			
FY 1999 President's Budget:	-.608	+5.910	+26.998
FY 2000/01 PRES Budget Submit:	17.297	30.877	50.642

Funding: FY98 reflects SBIR reduction (-$284 thousand) and below threshhold reprogrammings (-$324 thousand). FY99 reflects acceleration of C4I Upgrade Development (+$2,146 thousand), and Congressional adds for CH-60 integration (+$2,000 thousand) and SWIMS acoustic projector development (+$2,000 thousand), and minor program reductions (-$21 thousand) amd Congressional undistributed reductions (-$215 thousand). FY00 reflects acceleration of development efforts for SWIMS (+$5,000 thousand), AQS-20/X (+$3,300 thousand) and ALMDS (+$14,300 thousand), inflation adjustments (-$602 thousand), and initiation of E&MD for the Rapid Airbore Mine Clearing System (RAMICS (+$5.000 thousand)).

Schedule: See individual project sheets.

Technical: See individual project sheets.

Exhibit R-2a, RDT&E,N Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N , BA-5	PROGRAM ELEMENT NAME AND NUMBER:Airborne Mine Countermeasures/0604373N	PROJECT NAME AND NUMBER: Airborne Mine Hunt Systems/Q0529

Cost ($ in Millions)	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Project Cost	15.411	19.844	15.599	17.064	10.011	0	0	0	0	174.915
RDT&E Articles Qty										

A Mission Description and Budget Item Justification

This project includes a sonar for mine detection, classification and identification; a system for mine neutralization by explosive charge, equipment to provide shallow water mine sweeping. 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 for mine identification and to integrate AMCM systems with an CH-60S platform. The sonar will be developed to meet the capabilities inherent with the new tow platform.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS

1. (U) FY 1998 ACCOMPLISHMENT:

- (U) ($3.056) Q-20 – Completed contractor demonstration. Accepted delivery of Engineering Development Model.
- (U) ($4.519) Q-20 – Conducted final AQS-20 Developmental Testing and transition to the Advanced Sonar system.
- (U) ($2.771) AMNS – Delivered NDI prototype model.
- (U) ($2.558) AMNS – Conducted fly-off testing.
- (U) ($2.507) AMNS – Procured and test the test equipment, and perform data analysis.

2. (U) FY 1999 PLAN:

- (U) ($7.390) AN/AQS-20/X – Completing EDM 2 and conducting the DT assist.
- (U) ($.200) HORIGAN – Configuration Theory Tactical Decision Aid.
- (U) ($3.192) Laser Line Scan System (LLSS) – Initiate integration of the LLSS into the AN/AQS-14A.
- (U) ($6.321) AMNS - Award EMD contract for integration into the helicopter.
- (U) ($2.383) AMNS - Perform system integration, data analysis, TECHEVAL preparations.
- (U) ($.358) Portion of extramural program is reserved for Small Business Innovation Research assessment in accordance with 15 USC 638.

3. (U) FY 2000 PLAN:

- (U) ($2.506) LLSS – Continue integration into the AN/AQS-14A and demonstrate the LLSS.
- (U) ($5.269) AN/AQS-20/X – Continue integration of ID Sensor and H-60 conversion.

Exhibit R-2a, RDT&E,N Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N , BA-5	PROGRAM ELEMENT NAME AND NUMBER:Airborne Mine Countermeasures/0604373N	PROJECT NAME AND NUMBER: Airborne Mine Hunt Systems/Q0529

- (U) ($7.824) AN/AQS-20/X – Design identification system and initiate modification of EDMs.
- (U) AMNS – Transferred to project Q2473 P.E. 0604373N

B. Other Program Funding Summary

	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Complete	Total Cost
OPN 424800										
AQS-20/X	0	0	18.200	12.000	18.773	32.145	25.944	21.000	0	128.062
AN/AQS-14A LLSS	0	0	0	4.448	0	0	0	0	0	4.448

C. Acquisition Strategy: Continue AN/AQS-20 to OPEVAL and Milestone III, procuring three (3) LRIP systems starting in FY 01. This gives the fleet an MH-53E interim capability. P^3I the AQS-20 with ID capability and integrate it to the H-60 platform, thus creating the AN/AQS-20X. FY 99 funds the interim capability of design, integration, and testing of an ID capability on the AN/AQS-14A Laser Line Scan (LLS). Limited production of four (4) systems in FY 01.

D. Schedule Profile: See attached.

Exhibit R-2a, RDT&E,N Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N , BA-5	PROGRAM ELEMENT NAME AND NUMBER:Airborne Mine Countermeasures/0604373N	PROJECT NAME AND NUMBER: Airborne Mine Hunt Systems/Q0529

AN/AQS-20/X SONAR MINE DETECTING SET

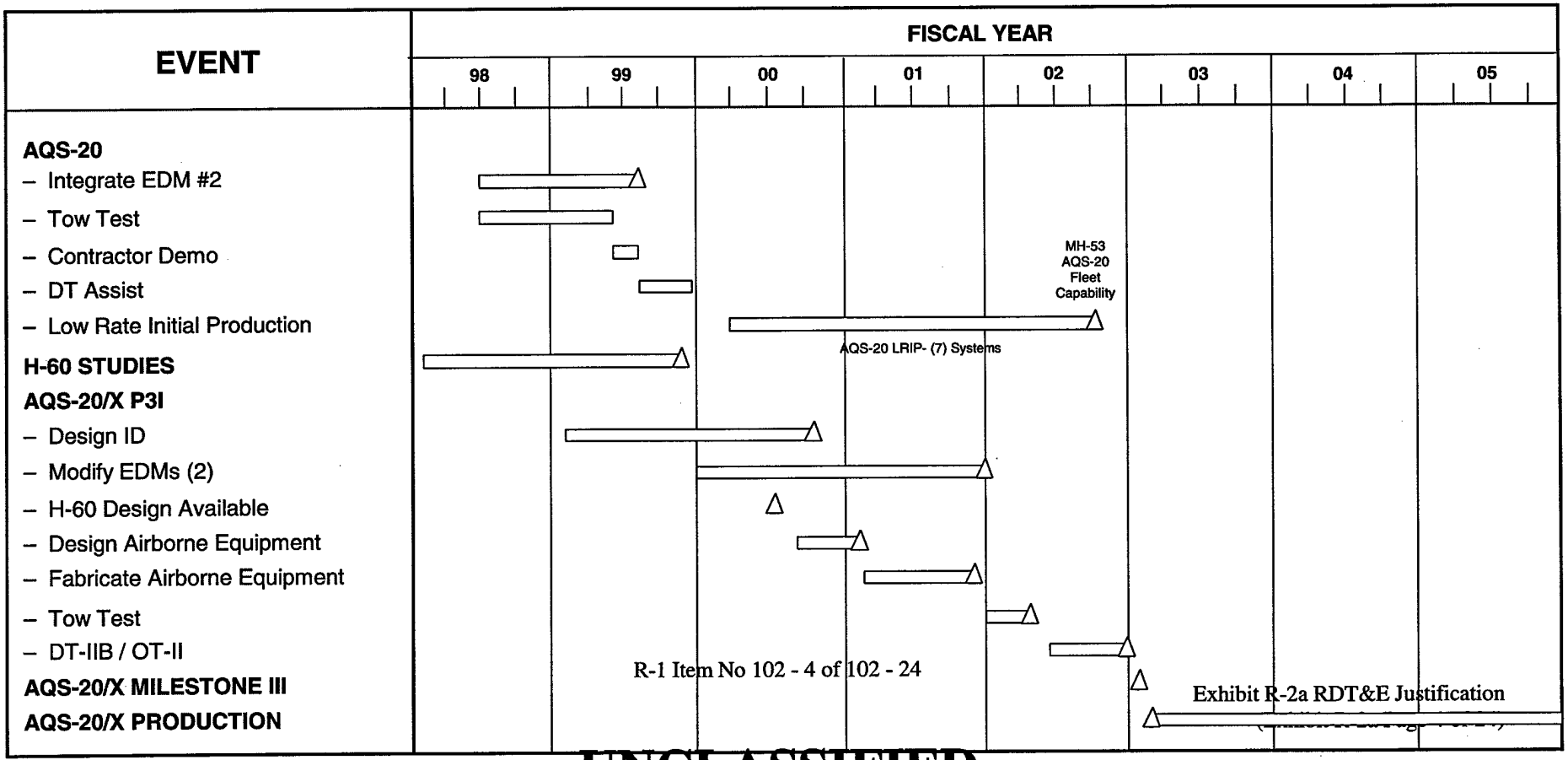


Exhibit R-2a, RDT&E,N Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N , BA-5	PROGRAM ELEMENT NAME AND NUMBER:Airborne Mine Countermeasures/0604373N	PROJECT NAME AND NUMBER: Airborne Mine Hunt Systems/Q0529

AN/AQS-14A SONAR DETECTING SET

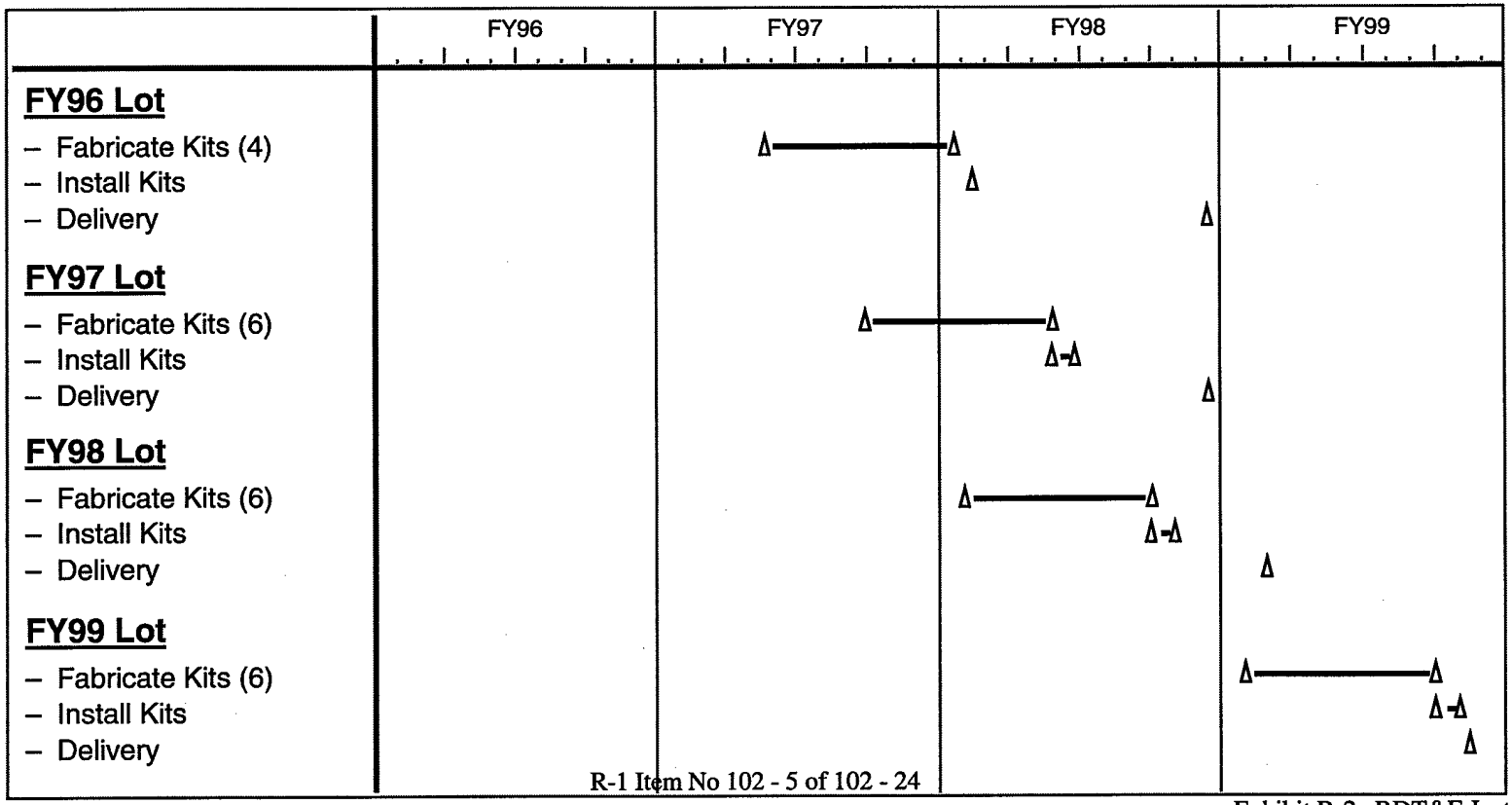


Exhibit R-2a, RDT&E,N Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N , BA-5	PROGRAM ELEMENT NAME AND NUMBER:Airborne Mine Countermeasures/0604373N	PROJECT NAME AND NUMBER: Airborne Mine Hunt Systems/Q0529

AIRBORNE MINE NEUTRALIZATION SYSTEM (AMNS)

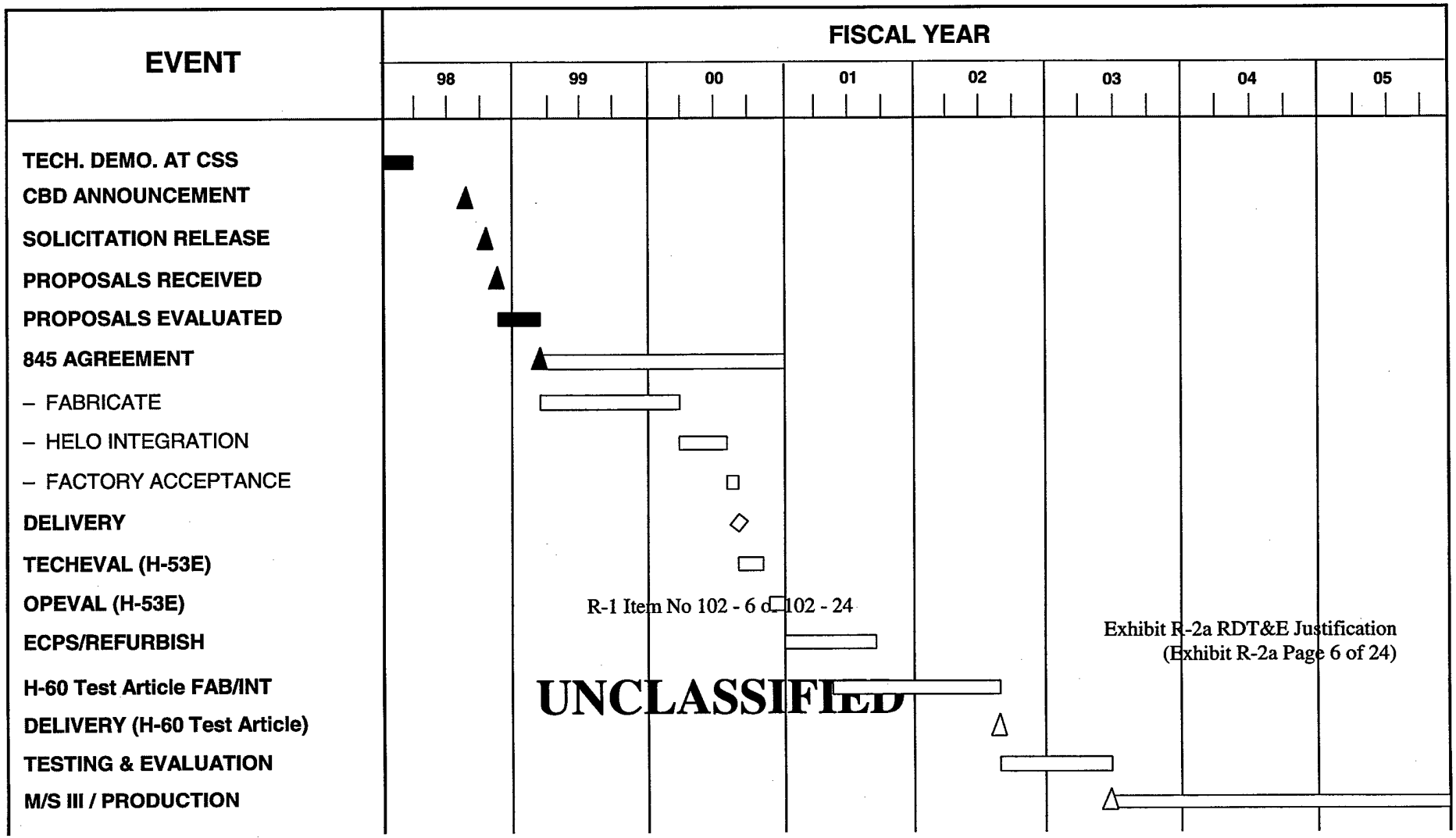


Exhibit R-3 Cost Analysis		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E,N/BA-5	Program Element Name & No: Airborne Mine Countermeasures 0604373N.	Project Name and Number: Airborne Mine Hunt Systems/Q0529

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date			Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development AQS-20/X AQS-14A LLS AMNS	 C/CPFF C/FF C/FP	 Raytheon, RI TBD TBD	54.631	 4.536 2.624 4.750	 01/99 10/98 12/98	 1.238 1.678	 11/99 10/99			17.902 1.134	78.307 5.436 4.750	
Ancillary Engineering AQS-20/X	C/CPFF	Raytheon, RI				5.700	11/99				5.700	
Systems Engineering		VARIOUS	33.535	.933	10/98						34.468	
Licenses												
Tooling												
GFE												
Award Fees												
Subtotal Product Development			88.166	12.843		8.616				19.036	128.661	
Remarks:												
Development Support Equipment	WR	VARIOUS		.910	10/98	.506	10/99	.		.592	2.008	
Software Development												
Training Development		VARIOUS	2.000								2.000	
Integrated Logistics Support		VARIOUS	3.852	.929	10/98						4.781	
Configuration Management		VARIOUS	2.000								2.000	
Technical Data												
GFE												
Subtotal Support			7.852	1.839		.506		.		.592	10.789	
Remarks:												

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	Fy00 Cost	FY00 Award Date			Cost To Complete	Total Cost	Target Value of Contract

Exhibit R-3 Cost Analysis		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E,N/BA-5	Program Element Name & No: Airborne Mine Countermeasures 0604373N.	Project Name and Number: Airborne Mine Hunt Systems/Q0529

Developmental Test & Evaluation	WR	CSS, Panama City		3.700	10/98					2.406	6.106	
Operational Test & Evaluation	WR	CSS, Panama City				4.500	10/99			3.511	8.011	
Tooling												
GFE												
Subtotal T&E				3.700		4.500				5.917	14.117	
Remarks:												
Contractor Engineering Support												
Government Engineering Support		VARIOUS	8.237								8.237	
Program Management Support		VARIOUS	8.142	1.402	11/98	1.957	11/99			1.510	13.011	
Program Management Personnel												
Travel				.060		.020		.		.020	.100	
Labor (Research Personnel)												
Overhead												
Subtotal Management			16.379	1.462		1.977				1.530	21.348	
Remarks:												
Total Cost			112.397	19.844		15.599				27.075	174.915	
Remarks: : AN/AQS-20/X Project Only (FY99=$7.590, FY00=$5.269, FY01=$15.072); AQS-14A LLS Project Only (FY99=$3.192, FY00=$2.506, FY01=$1.992); AMNS Project Only (FY99=$8.883)												

Exhibit R-2a, RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E,N/BA-5	Program Element Name & No: Airborne Mine Countermeasures 0604373N.	Project Name and Number: Shallow Water Influence Minesweep System/Q2427

Cost ($ in Millions)	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Project Cost	1.886	2.146	4.830	7.873	12.792	15.042	0	0	0	44.569
RDT&E Articles Qty										

A. Mission Description and Budget Item Justification

The SWIMS will provide a self-contained, high tow speed, shallow water influence minesweep capability.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS

1. (U) FY 1998 ACCOMPLISHMENTS:

- (U) ($1.886) Awarded contract for design development of the demonstration system. Procured material required for fabrication.

2. (U) FY 1999 PLAN:

- (U) ($2.146) Conduct Analysis of Alternatives. Prepare RFP and conduct proposal evaluation.

3. (U) FY 2000 PLAN:

- (U) ($4.830) Award contract and begin engineering/design efforts.

B. Other Program Funding Summary

	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Complete	Total Cost
OPN 424800										
SWIMS	9.581	0	0	0	0	3.600	15.700	6.300	17.000	52.181

C.Acquisition Strategy: Following an Analysis of Alternatives in FY99, a CPFF contract will be awarded using full and open competition. The program will be managed by PMS210.

D. Schedule Profile

Exhibit R-2a, RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E,N/BA-5	Program Element Name & No: Airborne Mine Countermeasures 0604373N.	Project Name and Number: Shallow Water Influence Minesweep System/Q2427

SHALLOW WATER INFLUENCE MINESWEEP SYSTEM (SWIMS)

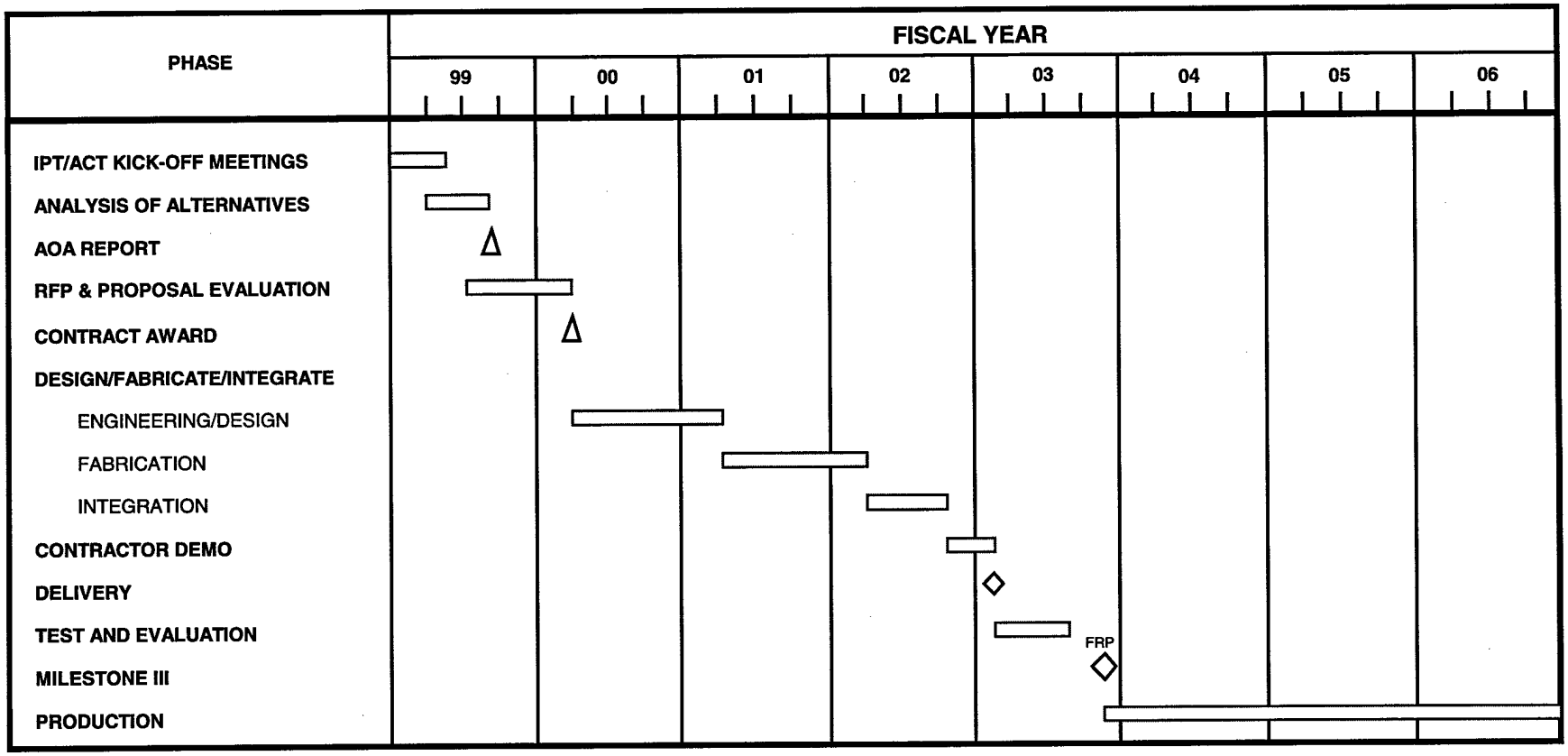


Exhibit R-2a, RDT&E Project Justification			Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E,N/BA-5	Program Element Name & No: Airborne Mine Countermeasures 0604373N.	Project Name and Number: Shallow Water Influence Minesweep System/Q2427	

SWIMS ACOUSTIC PROJECTOR

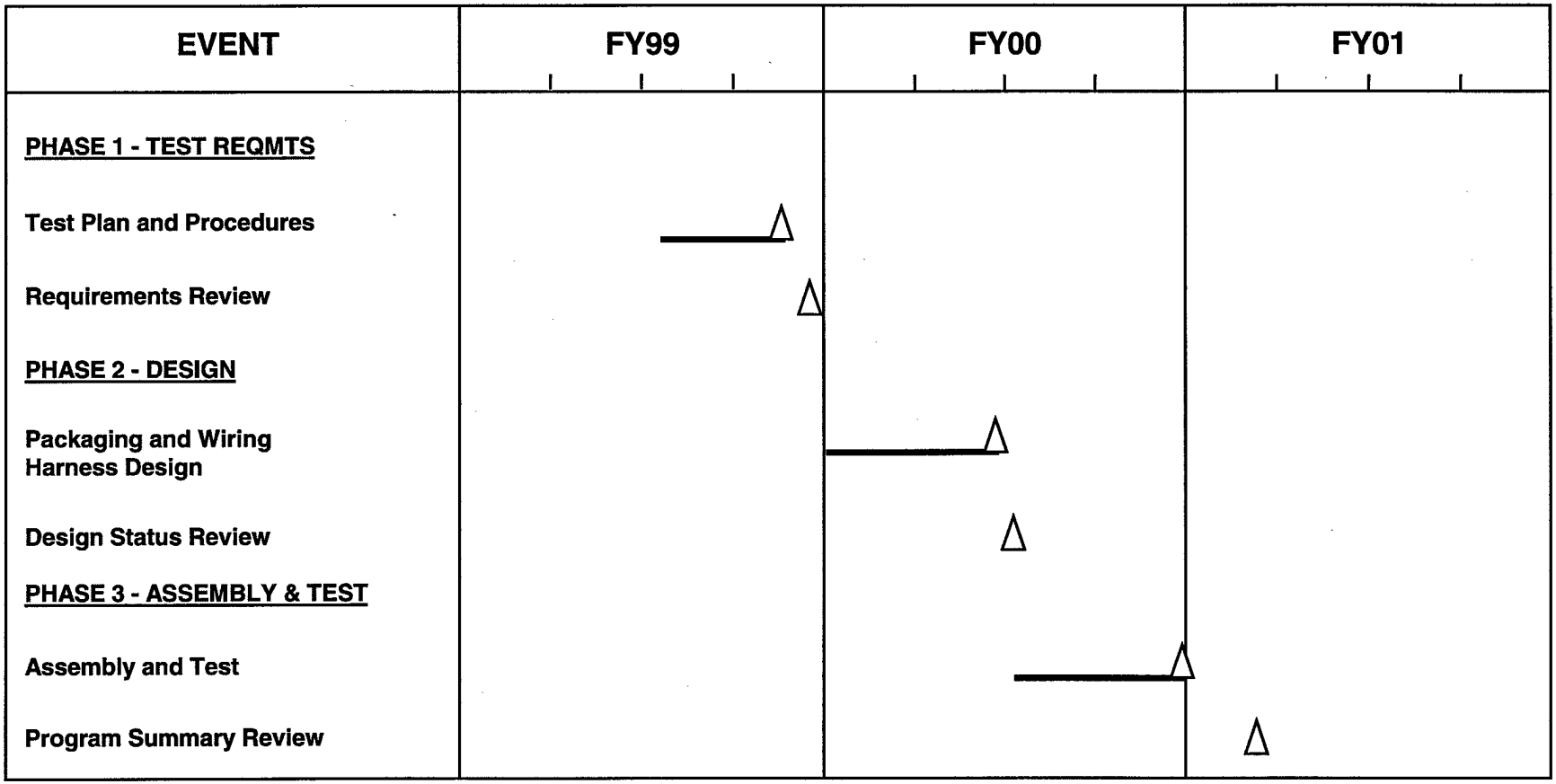


Exhibit R-3 Cost Analysis		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N	Program Element Name & No.Airborne Mine Countermeasures 0604373N	Project Name and Number. Shallow Water Influence Minesweep System/Q2427

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date		FY01 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	C/CPFF	EDO Corp/TBD	1.722	0	N/A	.750	11/99			11.215	13.687	
Ancillary Hardware Development												
Systems Engineering		VARIOUS				2.171	11/99			3.142	5.313	
Licenses												
Tooling												
GFE												
Award Fees												
Subtotal Product Development			1.722	0		2.921				14.357	19.000	
Remarks:												
Development Support Equipment												
Software Development		TBD	0	0		.300	11/99			1.110	1.410	
Training Development		TBD	0	0		0				1.000	1.000	
Integrated Logistics Support		TBD	0	0		.420	11/99	.		1.600	2.020	
Configuration Management		TBD	0	0		.277	11/99	.		1.300	1.577	
Technical Data												
GFE												
Subtotal Support			0	0		.997				5.010	6.007	
Remarks:												

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	Fy00 Cost	FY00 Award Date			Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation		VARIOUS	0	0		0				4.000	4.000	
Operational Test & Evaluation		VARIOUS	0	0		0				5.752	5.752	
Tooling												
GFE												

Exhibit R-3 Cost Analysis		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N	Program Element Name & No.Airborne Mine Countermeasures 0604373N	Project Name and Number. Shallow Water Influence Minesweep System/Q2427

Subtotal T&E			0	0		0				9.752	9.752	
Remarks:												
Contractor Engineering Support		TBD		.120	11/98						.120	
Government Engineering Support	WR	TBD	.040	.905	11/98	.250	11/99			1.748	2.943	
Program Management Support		VARIOUS	.122	1.091	11/98	.637	11/99			4.740	6.590	
Program Management Personnel												
Travel			.002	.030		.025				.100	.157	
Labor (Research Personnel)												
Overhead												
Subtotal Management			.164	2.146		.912				6.588	9.810	
Remarks:												
Total Cost			1.886	2.146		4.830				35.707	44.569	
Remarks:												

Exhibit R-2a, RDT&E,N Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/BA-5	Program Element Name & No.Airborne Mine Countermeasures 0604373N	Project Name and Number. Airborne Laser Mine Detection Systems/Q2047

Cost ($ in Millions)	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Project Cost	0	4.897	19.904	18.272	15.083	21.636	0	0	0	79.792
RDT&E Articles Qty										

A. Mission Description and Budget Item Justification

Airborne Laser Mine Detection Systems (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 was conducted in FY 98. Data obtained from this evaluation will significantly reduce the risk associated with a follow-on ALMDS procurement decision.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS

1. (U) FY 1998 Plan

- Not applicable.

2. (U) FY 1999 Plan

- (U) ($.984) Prepare RFP, evaluate response to award contract.
- (U) ($1.000) Evaluate integration studies.
- (U) ($1.872) Initiate engineering design.
- (U) ($.960) Prepare MS II documentation.
- (U) ($.081) Portion of extramural program is reserved for Small Business Innovation Research assessment in accordance with 15 USC 638.

3. (U) FY 2000 Plan

- (U) ($14.413) Award contract for EMD and perform systems engineering.
- (U) ($5.491) Continue the development of support equipment, software, training, ILS, configuration and technical data.

B. Other Program Funding Summary

	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Complete	Total Cost
OPN 424800 ALMDS	0	0	0	0	0	0	29.400	45.000	0	74.400

C. Acquisition Strategy: Full and open competition is planned for the ALMDS EMD program.

D. Schedule Profile: See attached.

Exhibit R-2a, RDT&E,N Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/BA-5	Program Element Name & No.Airborne Mine Countermeasures 0604373N	Project Name and Number. Airborne Laser Mine Detection Systems/Q2047

AIRBORNE LASER MINE DETECTION SYSTEM

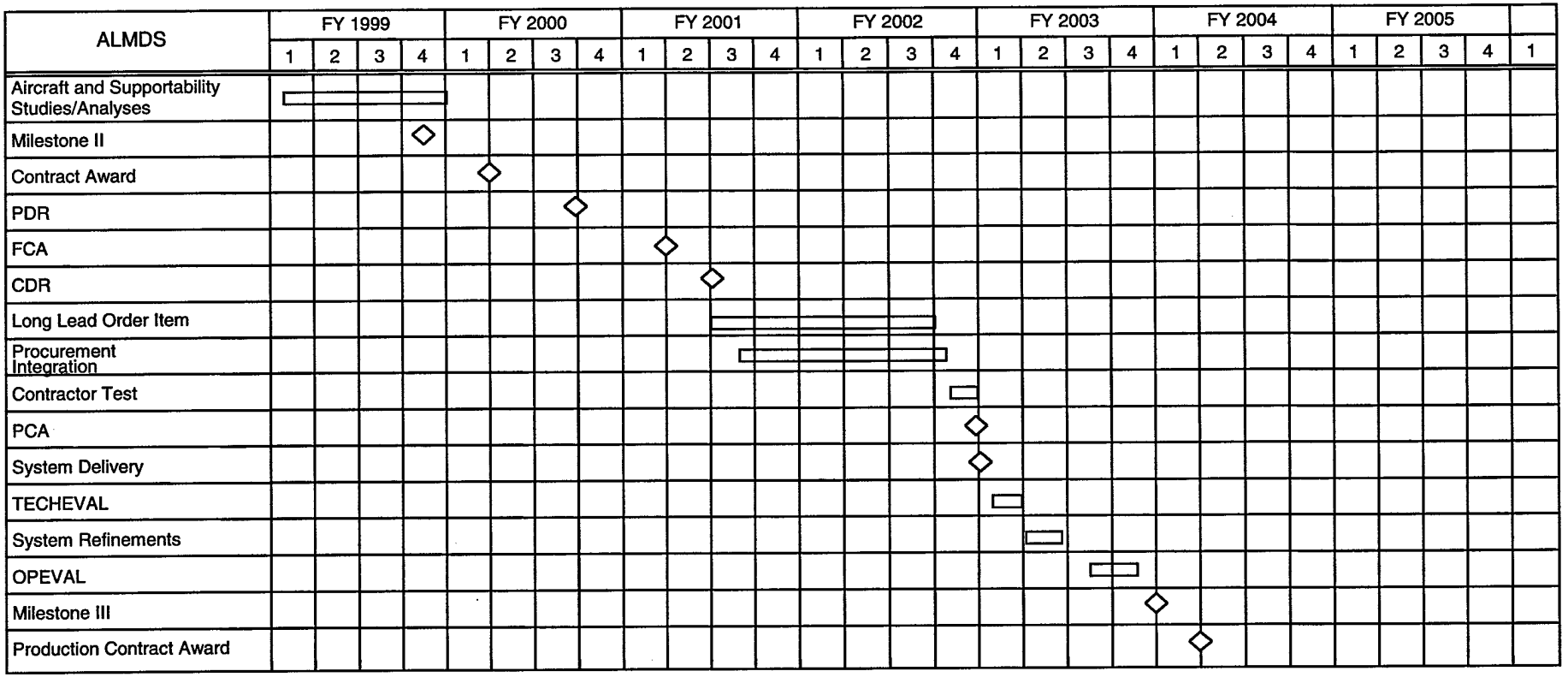


Exhibit R-3 Cost Analysis		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/BA-5	Program Element Name & No.Airborne Mine Countermeasures 0604373N	Project Name and Number. Airborne Laser Mine Detection Systems/Q2047

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date			Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	CPFF WR	TBD CSS, Panama City		 .924	 10/98	5.000 2.000	12/99 9/99			19.000 3.446	24.000 6.370	
Ancillary Hardware Development												
Systems Engineering												
Licenses	CPFF	TBD				.300	11/99				.300	
Tooling	CPFF	TBD				.481	11/99			.115	.596	
GFE												
Award Fees												
Subtotal Product Development				.924		7.781				22.561	31.266	
Remarks:												
Development Support Equipment	CPFF WR	TBD CSS, Panama City				.750 .800	12/99 11/99			1.000 .976	1.750 1.776	
Software Development	CPFF WR	TBD CSS, Panama City		 .500	 11/98	1.500 1.500	12/99 11/99			2.851 2.000	4.351 4.000	
Training Development	CPFF WR	TBD CSS, Panama City								1.300 1.284	1.300 1.284	
Integrated Logistics Support	CPFF WR	TBD CSS, Panama City				.750 .750	12/99 11/99			1.150 1.100	1.900 1.850	
Configuration Management	CPFF WR	TBD CSS, Panama City				.500 .200	12/99 11/99			1.000 .700	1.500 .900	
Technical Data	CPFF WR	TBD CSS, Panama City		 1.000	 10/98	.750 .750	12/99 11/99			1.750 .950	2.500 2.700	
GFE												
Subtotal Support				1.500		8.250				16.061	25.811	
Remarks:												

Exhibit R-3 Cost Analysis		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/BA-5	Program Element Name & No.Airborne Mine Countermeasures 0604373N	Project Name and Number. Airborne Laser Mine Detection Systems/Q2047

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	Fy00 Cost	FY00 Award Date			Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	CPFF WR	TBD CSS, Panama City								1.000 3.500	1.000 3.500	
Operational Test & Evaluation	CPFF WR	TBD CSS, Panama City								1.000 4.000	1.000 4.000	
Tooling												
GFE												
Subtotal T&E										9.500	9.500	
Remarks:												
Contractor Engineering Support	CPFF	TBD				.750	12/99			1.250	2.000	
Government Engineering Support	WR	CSS, Panama City		1.439	11/98	.750	11/99			1.319	3.508	
Program Management Support	CPFF WR	TBD CSS, Panama City		 1.000	 11/98	1.000 .726	12/99 11/99			1.500 1.525	2.500 3.251	
Program Management Personnel												
Travel		VARIOUS		.034	11/98	.175	11/99			.825	1.034	
Labor (Research Personnel)		VARIOUS				.472				.450	.922	
Overhead												
Subtotal Management				2.473		3.873				6.869	13.215	
Remarks:												
Total Cost			0	4.897		19.904				54.991	79.792	
Remarks:												

Exhibit R-2a RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/BA-5	Program Element Name & No.Airborne Mine Countermeasures 0604373N	Project Name and Number. Airborne Mine Neutralization Systems/Q2473

Cost ($ in Millions)	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Project Cost	0	1.995	10.309	8.070	18.696	16.615	9.824	0	0	65.509
RDT&E Articles Qty										

A. Mission Description and Budget Item Justification

This is a system for mine neutralization by explosive charge, and equipment 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 Airborne Mine Neutralization System (AMNS) research and development effort was restarted in FY97 in Project Q0529 P.E. 0604373N. AMNS will provide the capability to neutralize bottom and moored mines using an airborne delivered, expendable mine neutralization device.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS

1. (U) FY 1998 Plan

- Not applicable.

2. (U) FY 1999 Plan

- (U) ($.051) Portion of extramural program is reserved for Small Business Innovation Research assessment in accordance with 15 USC 638.
- (U) ($1.944) AMNS - Perform study to evaluate the effectiveness of autonomous operational mine neutralization. Congressional Add.

3. (U) FY 2000 Plan

- (U) ($1.603) AMNS - Will take delivery of prototype neutralizers, prototype AMNS and integrate aboard H-53.
- (U) ($3.706) AMNS - Will conduct TECHEVAL and OPEVAL testing for MH-53 interim capability.
- (U) ($5.000) RAMICS – H-60 gun integration.

B. Other Program Funding Summary

	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Complete	Total Cost
OPN 424800										
AMNS	0	0	4.300	7.700	7.700	7.700	7.700	7.700	0	42.800
RAMICS	0	0	0	0	0	0	0	21.000	0	21.000

C. Acquisition Strategy: Full and open competition is planned for the ALMDS EMD program.

D. Schedule Profile: See attached.

Exhibit R-2a RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/BA-5	Program Element Name & No.Airborne Mine Countermeasures 0604373N	Project Name and Number. Airborne Mine Neutralization Systems/Q2473

RAPID AIRBORNE MINE CLEARANCE SYSTEM

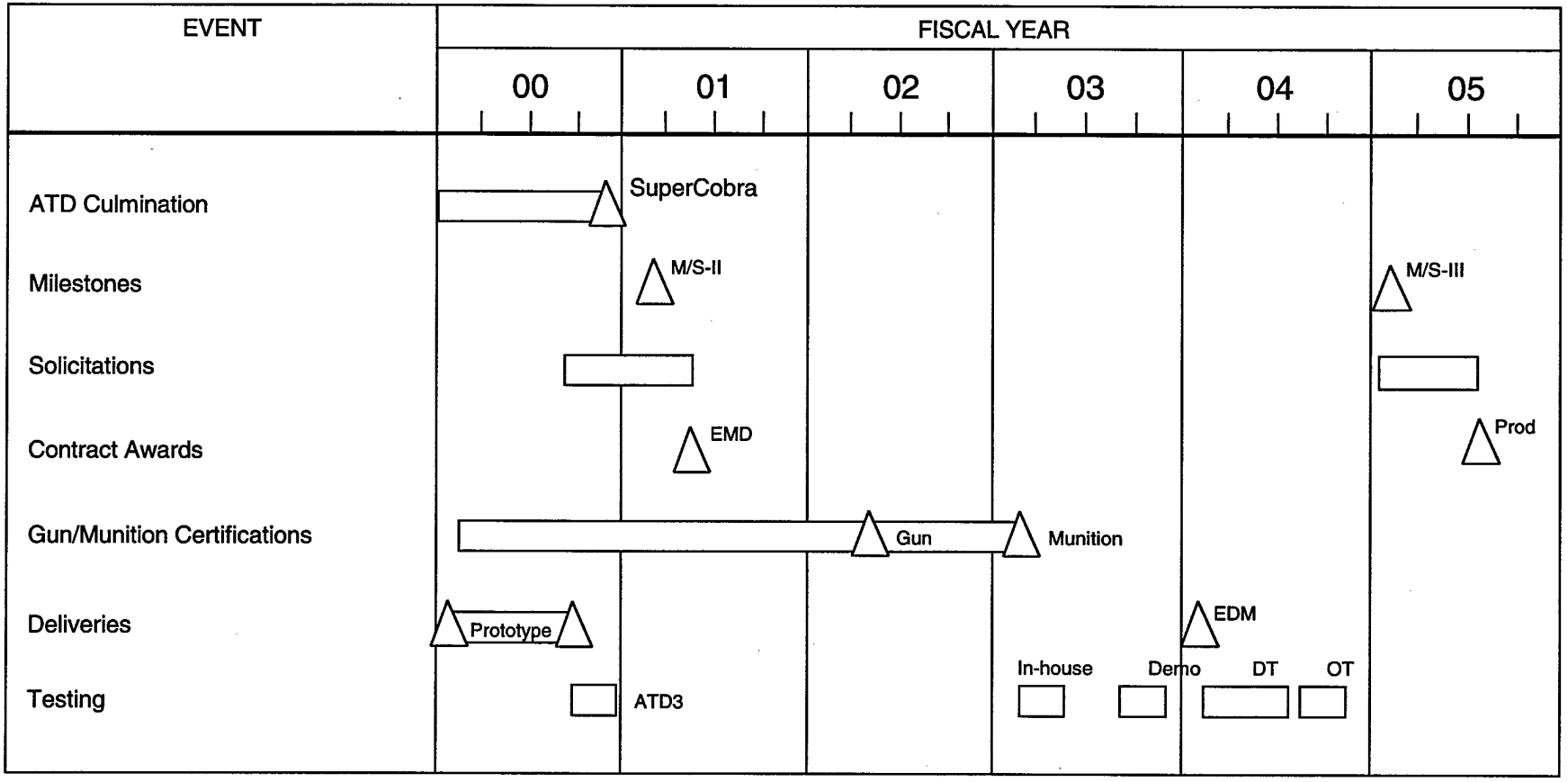


Exhibit R-3 Cost Analysis		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/BA-5	Program Element Name & No.Airborne Mine Countermeasures 0604373N	Project Name and Number. Airborne Mine Neutralization Systems/Q2642

	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date			Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development AMNS RAMICS	C/FP	TBD				.150 2.500	12/99	.		2.800 24.000	2.950 26.500	
Ancillary Hardware Development												
Systems Engineering	WR	VARIOUS				2.738	10/99			10.300	13.038	
Licenses												
Tooling												
GFE												
Award Fees												
Subtotal Product Development						5.388				37.100	42.488	
Remarks:												
Development Support Equipment												
Software Development												
Training Development												
Integrated Logistics Support	WR	VARIOUS				1.200	10/99			.685	1.885	
Configuration Management												
Technical Data												
GFE												
Subtotal Support						1.200				.685	1.885	
Remarks:												

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	Fy00 Cost	FY00 Award Date			Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	CSS, Panama City				3.456	10/99			8.005	11.461	
Operational Test & Evaluation	WR	OPTEVFOR								7.005	7.005	

Exhibit R-3 Cost Analysis		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/BA-5	Program Element Name & No.Airborne Mine Countermeasures 0604373N	Project Name and Number. Airborne Mine Neutralization Systems/Q2642

Tooling												
GFE												
Subtotal T&E						3.456				15.010	18.466	
Remarks:												
Contractor Engineering Support		VARIOUS		1.944	11/98						1.944	
Government Engineering Support												
Program Management Support	C/FP	TBD				.200	10/99			.200	.400	
Program Management Personnel												
Travel				.051		.065				.210	.326	
Labor (Research Personnel)												
Overhead												
Subtotal Management				1.995		.265		.		.410	2.670	
Remarks: AMNS Project Only (FY00=$5.458, FY01=$3.200, FY02=$4.000, FY=$1.900); RAMICS Project Only (FY00=$5.000, FY01=$5.000, FY02=$15.000, FY03=$15.000, FY04=$10.000)												
Total Cost			0	1.995		10.309				53.205	65.509	

Exhibit R-2a, RDT&E,N Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/BA-5	Program Element Name & No.Airborne Mine Countermeasures 0604373N	Project Name and Number. Airborne Mine Neutralization Systems/Q2642

Cost ($ in Millions)	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Project Cost	0	1.995	0	0	0	0	0	0	1.995	1.995
RDT&E Articles Qty										

A. Mission Description and Budget Item Justification

The SWIMS will provide a self-contained, high tow speed, shallow water influence minesweep capability.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS

1. (U) FY 1998 Plan

- Not applicable.

2. (U) FY 1999 Plan

- (U) ($1.995) Establish test plans and procedures.

3. (U) FY 2000 Plan

- Not applicable.
-
-

B. Other Program Funding Summary

FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Complete	Total Cost

Not applicable.

C. Acquisition Strategy:

D. Schedule Profile: See attached.

Exhibit R-2a, RDT&E,N Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/BA-5	Program Element Name & No.Airborne Mine Countermeasures 0604373N	Project Name and Number. Airborne Mine Neutralization Systems/Q2642

	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date			Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	SS/FP	EDO Corp		1.000	01/99						1.000	
Ancillary Hardware Development												
Systems Engineering												
Licenses												
Tooling												
GFE												
Award Fees												
Subtotal Product Development				1.000							1.000	
Remarks:												
Development Support Equipment												
Software Development												
Training Development												
Integrated Logistics Support												
Configuration Management												
Technical Data												
GFE												
Subtotal Support												
Remarks:												
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	Fy00 Cost	FY00 Award Date			Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	CSS, Panama City										

Exhibit R-2a, RDT&E,N Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/BA-5	Program Element Name & No.Airborne Mine Countermeasures 0604373N	Project Name and Number. Airborne Mine Neutralization Systems/Q2642

Operational Test & Evaluation	WR	CSS, Panama City		.995	01/99						.995	
Tooling												
GFE												
Subtotal T&E				.995							.995	
Remarks:												
Contractor Engineering Support												
Government Engineering Support												
Program Management Support												
Program Management Personnel												
Travel												
Labor (Research Personnel)												
Overhead												
Subtotal Management												
Remarks:												
Total Cost			0	1.995		0					1.995	

Exhibit R-2, RDT&E Budget Item Justification	Date: February 1999
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/5	R-1 Item Nomenclature SUBMARINE SYSTEM EQUIPMENT DEVELOPMENT/0604503N

COST ($ in Millions)	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Total P.E. Cost	56.0	61.9	48.9	34.9	38.7	41.5	62.7	65.8	CONT.	CONT.
F0775/ Submarine Support Equipment	0	2.6	1.0	1.0	.7	.7	.7	.7	CONT.	CONT.
F0219/ Submarine Sonar Improvement	45.3	48.9	40.0	28.0	22.5	20.4	42.1	38.1	CONT.	CONT.
X0742/ Submarine Integrated Antenna Systems	6.0	2.9	2.0	1.0	5.9	14.9	14.6	21.6	CONT.	CONT.
X1411/ Submarine Tactical Communications Systems	4.7	7.5	5.9	5.0	9.7	5.6	5.4	5.5	CONT.	CONT.
Quantity of RDT&E Articles	0	0	2.5/6.2	0	0	0	0	0		

A. (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) evaluation and resolution, 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.

(U) The Submarine Sonar Improvement Program delivers block updates to Sonar Systems installed on SSN 688, 688I, 21 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 (ELF), Extremely High Frequency (EHF), 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.

Exhibit R-2, RDT&E Budget Item Justification	Date: February 1999
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/5	R-1 Item Nomenclature SUBMARINE SYSTEM EQUIPMENT DEVELOPMENT/0604503N

B. (U) Program Change Summary:

	FY 1998	FY 1999	FY 2000
FY 1999 President's Budget:	56.0	50.3	43.3
Appropriated Value:	57.5	62.3	0
Adjustment to FY 1998 Appropriated Value/FY 1999 President's Budget:			
a. Congressional Undistributed Reductions	-1.5		
b. SBIR Reduction	-1.0		
c. Towed Arrays and Handlers			4.2
d. Fund BSY-2 OER from R&D vice OPN			3.2
e. minor pricing adjustments	1.0	-.4	-4.0
f. precision bottom mapping			2.1
FY 2000/01 PRES Budget Submit:	56.0	61.9	48.8

(U) Change Summary Explanation:

Funding: See individual program element summaries

Schedule: See individual program element summaries

Technical: See individual program element summaries

Exhibit R-2a, RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/5	PROGRAM ELEMENT/NUMBER Submarine System Equipment Development/0604503N	PROJECT NAME AND NUMBER Submarine Support Equipment Development / F0775

Cost ($ in Millions)	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Submarine Support Equipment/ F0775	0	2.6	1.0	1.0	.7	.7	.7	.7	CONT.	CONT.
RDT&E Articles Qty	0	0	0	0	0	0	0	0	0	0

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 Electronic Support Measures 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) Integrated ESM Mast, (3) ESM On Board Team Trainer, (4) ESM software Problem Trouble Report evaluation and resolution and de-installation of the ESM Engineering Developmental Model from the DT/OT test platform. The ESM system is also planned for backfit on SSN 688 and SEAWOLF class submarines. Two ESM system EDM's were procured in FY95 (included F1950 funding). One EDM will be used for system integration testing and at-sea testing on board an SSN 688 class submarine. The other ESM EDM will be used for shock qualification testing. Two IEM EDMs were procured in FY93 (included F1950 funding) and are provided as GFE to the ESM EDM contract. There are no new test articles being procured during this timeframe. OBTT will be an upgrade to the two ESM EDM's presently under development. An OBTT is being developed for the ESM system presently under development. OBTT is required by the NSSN ORD.

(U) Program Accomplishments and Plan:

1. (U) FY 1998 Accomplishments:
   - (U) Project Funded under Program Element 0604558N Project F1950.
2. (U) FY 1999 Plan:
   - (U) Install ESM EDM on a SSN 688 test platform. (Effort funded by P.E. 0604558N, Project F1950)
   - (U) ($1.9) Begin engineering development of ESM OBTT.
   - (U) ($.6) Perform ESM software PTR evaluation and resolution.
   - (U) ($.1) Portion of extramural program is reserved for Small Business Innovation Research assessment in accordance with 15 USC 638.
3. (U) FY 2000 Plan:
   - (U) ($.3) Complete ESM OBTT engineering development.
   - (U) ($.7) Continue to perform ESM software PTR evaluation and resolution.

Exhibit R-2a, RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/5	PROGRAM ELEMENT/NUMBER Submarine System Equipment Development/0604503N	PROJECT NAME AND NUMBER Submarine Support Equipment Development / F0775

(U) Program Change Summary:

	FY 1998	FY 1999	FY 2000
FY 1999 President's Budget:	0	2.6	1.0
Appropriated Value:	0	2.6	0
Adjustment to FY 1998 Appropriated Value/FY 1999 President's Budget:	0	0	0
FY 2000/01 PRES Budget Submit:	0	2.6	1.0

(U) Change Summary Explanation:

Funding: Not Applicable

Schedule: Not Applicable

Technical: Not Applicable

B. (U) Other Program Funding Summary:

	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Complete	Total Cost
OPN Line 256000 PE 0204281N SSEP ML015	0	0	14.1	14.8	12.8	26.4	20.6	21.0	0	109.7
MLXX1	0	0	0	0	0	6.0	0	7.0	0	13.0
MLXX2	0	0	0	0	0	0	0	10.0	0	10.0
OPN LI 256005 PE 0204281N SSEP ML51N	0	0	.03	.9	2.6	2.6	1.0	4.4	0	11.5
O&MN PE 0702827N/Subhead 8B2B SSEP	0	0	.7	2.8	2.8	2.9	2.9	3.0	Cont.	15.1
SCN LI 201300	26.5	19.2	0	20.0	20.5	0	22.3	22.8	668.8	800.7

Exhibit R-2a, RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/5	PROGRAM ELEMENT/NUMBER Submarine System Equipment Development/0604503N	PROJECT NAME AND NUMBER Submarine Support Equipment Development / F0775

PE 0204287N
Partial (ESM Only)

Related RDT&E:
(U) PE 0603562N/Submarine Tactical Warfare System
(U) PE 0604558N/New SSN Combat Systems Development/Project /F1950

2.1	2.3	1.0	0	0	0	0	0	0	5.9

(U) PE 0604558N/New SSN Combat Systems Development/ Project F2430

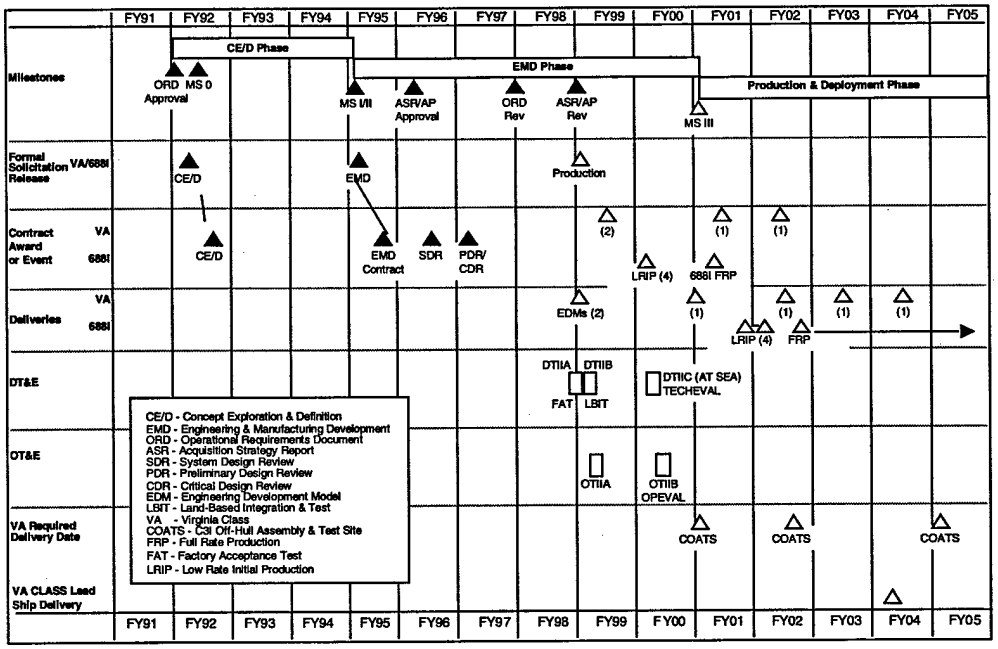
7.5	0	0	0	0	0	0	0	0	7.5

C. (U) Acquisition Strategy: Current efforts in this project consist of P3 improvements to the ESM system which is already under contract.

D. (U) Schedule Profile: ESM Program Schedule attached.

Exhibit R-2a, RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/5	PROGRAM ELEMENT/NUMBER Submarine System Equipment Development/0604503N	PROJECT NAME AND NUMBER Submarine Support Equipment Development / F0775

Program Schedule



Version 1.0

Team Submarine

Exhibit R-3 Cost Analysis		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/5	PROGRAM ELEMENT NAME AND NUMBER Submarine System Equipment Development / 0604503N	PROJECT NAME AND NUMBER Submarine Support Equipment Program / F0775

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date	FY01 Cost	FY01 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development												
IEM/HPI Interface	SS/CPIF	SENSYS Tech. Newington, VA	2.7	0	N/A	0	N/A	0	N/A	0	2.7	2.7
ESM/IEM BDE System EMD	C/FFP	Lockheed Martin Syracuse, NY	7.5	0	N/A	0	N/A	0	N/A	0	7.5	7.5
ESM OBTT/Software PTR fixes	SS/FFP	Lockheed Martin Syracuse, NY	0	2.6	12/98	1.0	12/99	0	0	CONT.	CONT.	TBD
Systems Engineering	WR	NUWC Newport, RI	3.8	0	N/A	0	N/A	0	N/A	0	3.8	N/A
Miscellaneous	WR/RCP	VARIOUS	12.4	0	N/A	0	N/A	0	N/A	0	12.4	N/A
GFE (AN/UYQ-70 Displays) Lockheed Martin Eagan, MN Delivered in FY96 to LMC Syracuse	C/FFP	Lockheed Martin Eagan, MN	.7	0	N/A	0	N/A	0	N/A	0	.7	N/A
IEM ADSU EMD (EDMs) E-Systems Goleta, Ca. EDM#1 delivered to LMC, Syracuse 9/97 EDM#2 to be delivered to LMC Syracuse 4/99	C/CPIF/ CPAF	E-Systems Goleta, CA	38.1	0	N/A	0	N/A	0	N/A	0	38.1	38.1
Award Fees	C/CPAF	E-Systems Goleta, CA	.2	0	N/A	0	N/A	0	N/A	0	.2	.2
Subtotal Product Development			65.4	2.6		1.0		0		CONT.	CONT.	N/A

Remarks: Both IEM and GFE EDMs will be used by the ESM EDM prime contractor for systems integration and shock qualification testing. Payment of award fees on the IEM ADSU EMD contract were discontinued due to cost and schedule problems. The contract was subsequently re-structured.

Exhibit R-3 Cost Analysis		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/5	PROGRAM ELEMENT NAME AND NUMBER Submarine System Equipment Development / 0604503N	PROJECT NAME AND NUMBER Submarine Support Equipment Program / F0775

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date	FY01 Cost	FY01 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Engineering Technical Services	C/CPIF	GRCI McLean, Va.	2.7	0	N/A	0	N/A	0	N/A	0	2.7	N/A
Studies Analysis & Evaluations	C	MITRE, McLean, Va	1.0	0	N/A	0	N/A	0	N/A	0	1.0	N/A
GFE												
Subtotal Support			3.7	0	N/A	0	N/A	0	N/A	0	3.7	N/A
Management Support Services	C/CPIF	GRCI McLean, Va/VITRO	3.1	0	N/A	0	N/A	0	N/A	0	3.1	N/A
Subtotal Management			3.1	0	N/A	0	N/A	0	N/A	0	3.1	N/A
Developmental/Operational Test & Evaluation	N/A	N/A		0		0		0		0		
Subtotal T&E	N/A	N/A		0		0		0		0		
Total Cost			72.2	2.6		1.0		0		CONT.	CONT.	CONT.

Exhibit R-2a, RDT&E Project Justification			Date: February 1999
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/5	PROGRAM ELEMENT/NUMBER Submarine System Equipment Development/0604503N	PROJECT NAME AND NUMBER Submarine Sonar Improvement / F0219	

Cost ($ in Millions)	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Submarine Sonar Improvement/ F0219	45.3	48.9	40.0	28.0	22.5	20.4	42.1	38.1	CONT.	CONT.
RDT&E Articles Qty	0	0	2.5/6.2	0	0	0	0	0	0	

A. (U) Mission Description and Budget Item Justification: This program delivers block updates to Sonar Systems installed on SSN 688, 688I, 21 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. 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 program (A-RCI). 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, SSN21, 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. Precision Bottom Mapping transition, integration and testing begin in FY01. 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; and (d) TB-29 () towed array Engineering Developmental Model (EDM) development. Two full and one partial TB-29() EDMs are being procured in FY00 to support developmental and operational testing. AN/BSY-2 efforts will focus on Block 4 Upgrade, which resolves reliability and obsolescence issues and maximizes commonality with existing submarine combat systems under the Integrated Development Plan (IDP) to minimize life cycle costs.

(U) Program Accomplishments and Plans:

1. (U) FY 1998 Accomplishments:

- (U) ($20.8) Conducted at-sea testing of A-RCI Phase I and Critical Design Review (CDR) of Phase III.
- (U) ($14.1) Continued research, development, training and deployment of the Multipurpose processor.
- (U) ($2.1) Continued transition of High Frequency (HF) Upgrade Arrays Designs to production and began First Article Test of HF Sensor and Transmit Equipment. Began transition of New SSN C3I developed High Frequency Processing Software to A-RCI for system integration and test.
- (U) ($7.4) Completed TB-29 OPEVAL and performed TB-29( ) concept development and commenced Engineering Manufacturing Development.
- (U ($.9) Continued development for Desk Top Computer Improvements (DTC).

2. (U) FY 1999 Plan:

Exhibit R-2a, RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/5	PROGRAM ELEMENT/NUMBER Submarine System Equipment Development/0604503N	PROJECT NAME AND NUMBER Submarine Sonar Improvement / F0219

- (U) ($15.7) Conduct at-sea testing of Acoustic Rapid Commercial Off-the-Shelf Insertion (A-RCI) Phase II and continue development of A-RCI Phase III.
- (U) ($11.2) Continue development of A-RCI Phase IV. Begin Advanced Processing Build Sea Testing.
- (U) (11.7) Continue research, development, training, and deployment of the Multipurpose Processor
- (U) ($8.4) Continue development of TB-29( ) towed array.
- (U) ($.9) Continue development for Desk Top Computer (DTC) Improvements.
- (U) ($1.0) Portion of extramural program is reserved for Small Business Innovative Research assessment in accordance with 15 USC 638.

3. (U) FY 2000 Plan:
   - (U) ($13.5) Continue development of A-RCI phase III. Conduct at-sea testing of A-RCI Phase I – IV.
   - (U) ($9.0) Continue development of A-RCI Phase IV. Continue Advanced Processing Build Sea Testing.
   - (U) ($9.3) Continue development of TB-29() towed array. Conduct TB-29() DT-IIA to support Low-Rate Initial Production Decision.
   - (U) ($.9) Continue development for DTC Improvements.
   - (U) ($5.2) Begin AN/BSY-2 block 4 development, integration and testing.
   - (U) ($2.1) Begin Precision Bottom Mapping transition, integration and testing.

(U) Program Change Summary:

	FY 1998	FY 1999	FY 2000
FY 1999 President's Budget:	47.0	37.2	31.0
Appropriated Value:	48.5	49.2	
Adjustment to FY 1998 Appropriated Value/FY 1999 President's Budget:			
a. Congressional Undistributed Reductions/SBIR reduction	-2.5		
b. Towed Arrays and Handlers			4.2
c. Fund BSY-2 OER from R&D vice OPN			3.2

Exhibit R-2a, RDT&E Project Justification			Date: February 1999
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/5	PROGRAM ELEMENT/NUMBER Submarine System Equipment Development/0604503N	PROJECT NAME AND NUMBER Submarine Sonar Improvement / F0219	

d. minor pricing adjustments	-.7	-.3	-.5
e. fund precision bottom mapping			2.1
FY 2000/01 PRES Budget Submit:	45.3	48.9	40.0

(U) Change Summary Explanation:

Funding: FY 1998 decreases of $1.5M for Congressional Undistributed Reductions adjustment, $1.0 SBIR reduction and $.7M for minor pricing adjustment. FY 1999 decrease of $.3M for minor pricing adjustments. FY2000 increases of $4.2M for Towed Arrays and Handlers, $3.2M to fund BSY-2 OER from R&D vice OPN, and $2.1M to fund precision bottom mapping. $.5M decrease for minor pricing adjustments.

Schedule: This submit establishes Acoustic Rapid Commercial Off-the-Shelf Insertion Phase I-IV program schedule.

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.

B. (U) Other Program Funding Summary:

OPN Line 21470

FY1998	FY1999	FY2000	FY2001	FY2002	FY2003	FY2004	FY2005	To Complete	Total Cost
79.7	144.1	227.0	123.3	129.4	227.5	165.9	168.2	CONT.	CONT.

RELATED RDT&E:

PE 0604524N (Submarine Combat Systems)
PE 0604558N (New SSN Combat Systems Development)
PE 0604561N (SSN-21 Development)
PE 0604562N (Submarine Tactical Warfare System (ENG))

Exhibit R-2a, RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/5	PROGRAM ELEMENT/NUMBER Submarine System Equipment Development/0604503N	PROJECT NAME AND NUMBER Submarine Sonar Improvement / F0219

C. (U) Acquisition Strategy: The TB-29() will be developed and manufactured under the US Navy Towed Systems Omnibus contract, awarded in FY99 to Lockheed Martin, Syracuse using full and open competition. This flexible contract vehicle will be used by submarine, surface ship, and surveillance towed system program offices. The contract is planned to take advantage of economies of scale in development and manufacturing and to encourage the use of commonality among all Navy towed systems. A Low-Rate Initial Production (LRIP) decision for TB-29 () is planned in FY00 based on developmental tests (DT-IIA). An Operational Evaluation (OPEVAL) on a SSN688 or SSN688I platform is planned in FY01 to support a Milestone III Release to Fleet (RTF) decision for TB-29().

A-RCI utilizes an open architecture and Commercial Off-the-Shelf products in support of new and upgraded sonar systems. A sole source cost plus award fee contract was awarded to Lockheed Martin Federal Systems. Program Review with Milestone Decision Authority was conducted in April 1998 granting approval for the FY98/99 production option.

D. (U) Schedule Profile: See attached schedules.

Exhibit R-2a, RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/5	PROGRAM ELEMENT/NUMBER Submarine System Equipment Development/0604503N	PROJECT NAME AND NUMBER Submarine Sonar Improvement / F0219

A-RCI MASTER PROGRAM SCHEDULE

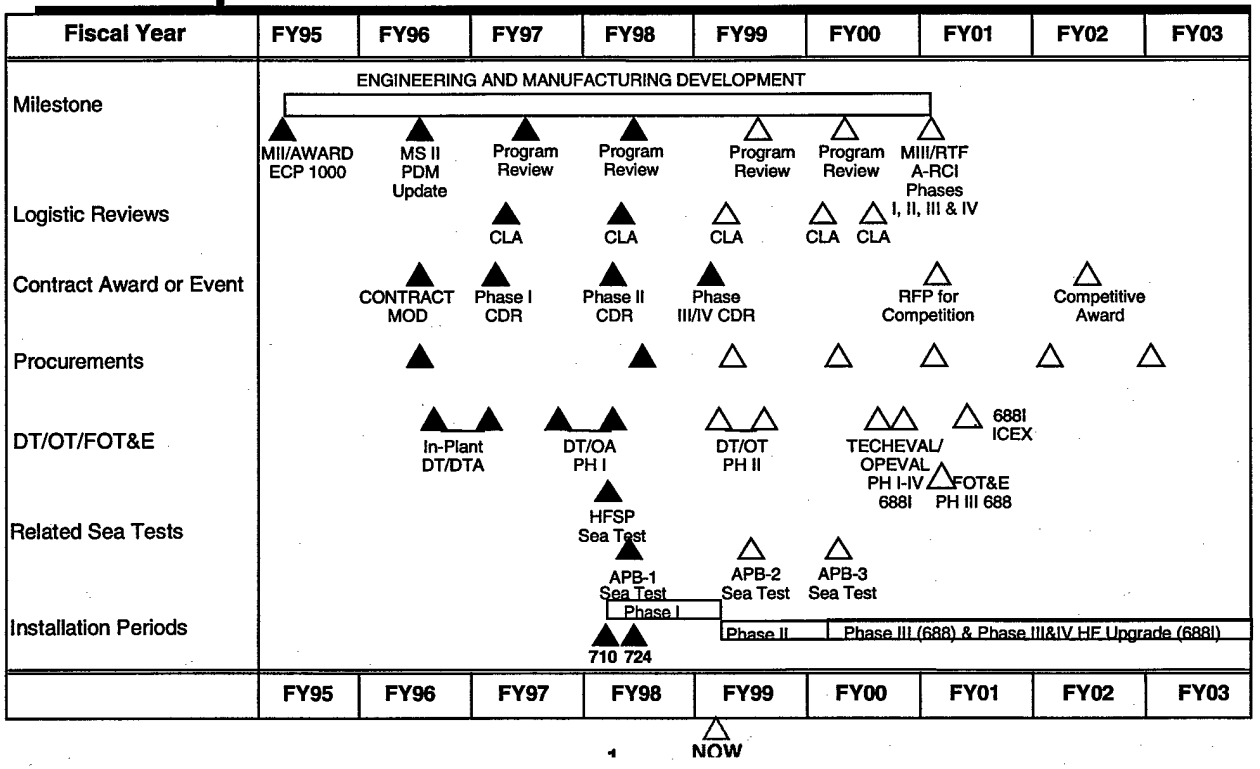
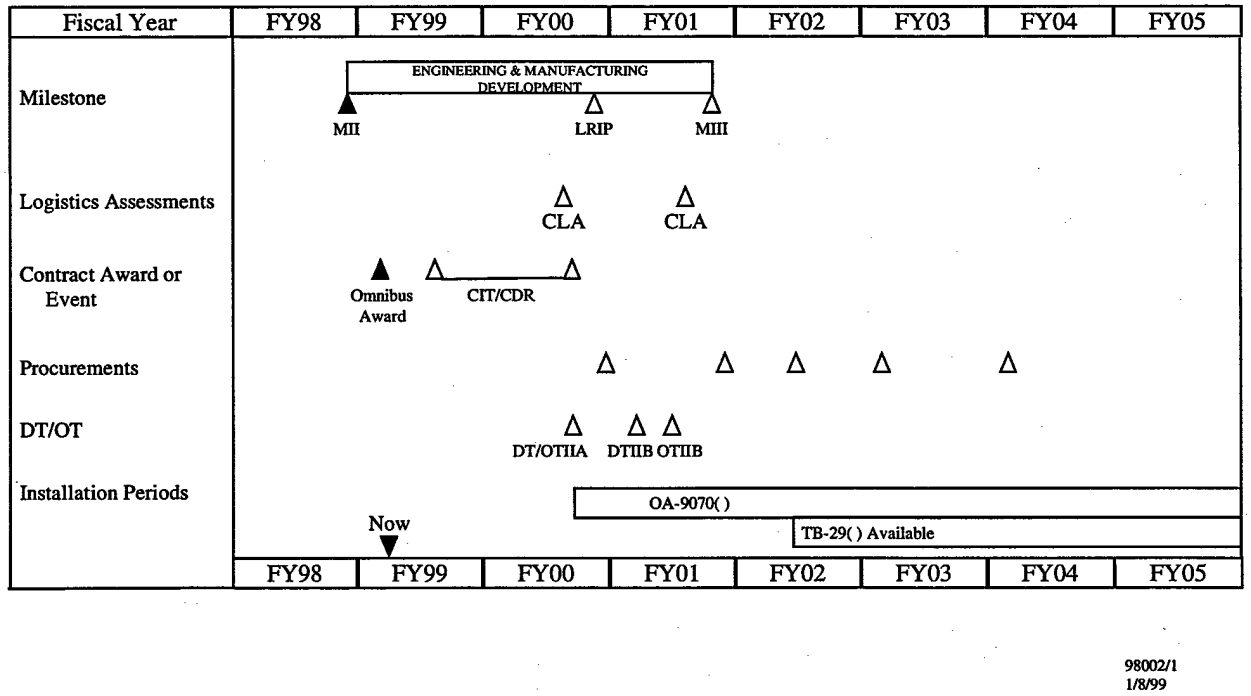


Exhibit R-2a, RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/5	PROGRAM ELEMENT/NUMBER Submarine System Equipment Development/0604503N	PROJECT NAME AND NUMBER Submarine Sonar Improvement / F0219

Master Program Schedule
TB-29( ) Development/Production

PROGRAM ELEMENT: 0604503N PROJECT NUMBER: F0219



98002/1
1/8/99

Exhibit R-3 Cost Analysis		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/5	PROGRAM ELEMENT NAME AND NUMBER Submarine System Equipment Development / 0604503N	PROJECT NAME AND NUMBER Submarine Sonar Improvement / F0219

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date	FY01 Cost	FY01 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	C/various	Lockheed Martin, Syr (OMNIBUS)	.3	5.6	12/98	6.6	N/A	1.4	N/A	CONT.	CONT.	23.14
Primary Hardware Development	SS/various	Chesapeake Science	1.4	1.2	N/A	.8	N/A	0	N/A	CONT.	CONT.	6.62
Primary Hardware Development	SS/CPAF	Lockheed Martin – Manassas, VA	57.5	9.0	11/98	6.9	11/99	0	N/A	0	73.4	73.4
Primary Hardware Development	SS/CPAF	Lockheed Martin – Manassas, VA	.3	5.5	11/98	1.5	11/99	1.8	11/00	0	7.6	7.6
System Engineering	WR	NUWC Newport	55.8	8.3	10/98	8.7	10/99	9.5	10/00	CONT.	CONT.	N/A
System Engineering	SS/CPAF	LMC, Syracuse	0	0	N/A	5.1	11/99	5.8	11/00	CONT.	CONT.	N/A
Miscellaneous	Various	Various		4.2		6.3		5.6		CONT	CONT.	
Subtotal Product Development			115.3	33.8		35.9		24.1		CONT.	CONT.	

Remarks: The maximum award fee budgeted for the LMC, Syracuse contract averages 10% of the value placed on contract:
10/1/96 – 3/31/97 received a rating of outstanding and 100% award
4/1/97 – 9/30/97 received a rating of outstanding and 100% award
10/1/97 – 3/31/98 received a rating of above average and 80% award.

The maximum award fee budgeted for the Lockheed Martin Federal Systems contract averages 12% of the value placed on contract.
8/1/96 – 12/31/96 received a rating of Excellent and 88.4% award.
1/1/97 – 6/30/97 received a rating of Outstanding and 100% award.
7/1/97 – 12/31/97 received a rating of Outstanding and 100% award.

OMNIBUS Contract was awarded in 1st quarter FY99.

Primary Software Development	SS/CPFF	Digital Systems Resources - VA	16.3	13.2	11/98	0	N/A	0	N/A	0	17.5	17.5
Subtotal Support			16.3	13.2		0		0		0	17.5	17.5

Exhibit R-3 Cost Analysis		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/5	PROGRAM ELEMENT NAME AND NUMBER Submarine System Equipment Development / 0604503N	PROJECT NAME AND NUMBER Submarine Sonar Improvement / F0219

Remarks:

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date	FY01 Cost	FY01 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Developmental/Operational Test & Evaluation	Various	Various	3.7	1.0	N/A	3.2	N/A	3.0	N/A	CONT.	CONT.	N/A
Subtotal T&E			3.7	1.0		3.2		3.0		CONT.	CONT.	
Remarks:												
Management Support Services	Various	Various	.7	.7	N/A	.7	N/A	.7	N/A	CONT.	CONT.	N/A
Travel	PD	NAVSEA	.2	.2	N/A	.2	N/A	.2	N/A	CONT.	CONT.	N/A
Subtotal Management			.9	.9		.9		.9		CONT.	CONT.	
Remarks:												
Total Cost			136.2	48.9		40.0		28.0		CONT.	CONT.	

Exhibit R-2a, RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/5	Program Element Name & No. 0604503N Submarine System Equipment Development	Project Name and Number. Submarine Integrated Antenna System/ X0742

Cost ($ in Millions)	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Submarine Integrated Antenna System/ X0742	6.0	2.9	2.0	1.0	5.9	14.9	14.6	21.6	Continuing	Continuing
RDT&E Articles Qty	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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 1998 Accomplishments:

   - (U) ($3.9) HDA - Completed development, started developmental testing.
   - (U) ($2.0) SADS - Assembled, integrated and tested. Performed developmental testing in support of op-assessment and LRIP.
   - (U) ($.1) Developed and updated Naval Command, Control, Communications, Computers, Intelligence, Sensors and Reconnaissance (C4ISR) implementation guidance.

2. (U) FY 1999 Plan:

   - (U) ($.5) HDA – Support development and operational testing
   - (U) ($.2) OE-538 – Conduct and support development and operational testing. Initiate P3I for an enhanced UHF antenna to provide higher gain.
   - (U) ($2.2) Antenna Transition Engineering – Provide system engineering, evaluate technology for submarine antenna applications, provide system architecture, and establish exit criteria for MSII. Also conduct FOT&E, P3I on Iridium antenna modification.

3. (U) FY 2000 Plan:

   - (U) ($.4) OE-538 – Initiate development for design changes required for Trident platform applications.
   - (U) ($1.2) Antenna Transition Engineering – Evaluation of Transitional Antenna Technology, catalog data, and provide testing of critical antenna parameters to meet submarine platform requirements. $1.0M plus-up for direct development of UHF SATCOM 3dB antenna gain. Investigate UAV link requirements and antenna modifications required to support this effort.
   - (U) ($.4) SADS – Conduct and support development and operational testing.

Exhibit R-2a, RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/5	Program Element Name & No. 0604503N Submarine System Equipment Development	Project Name and Number. Submarine Integrated Antenna System/ X0742

(U) Program Change Summary:

	FY 1998	FY 1999	FY 2000
FY 1999 President's Budget:	3.6	2.9	5.4
Appropriated Value:	3.6	2.9	0
Adjustment to FY 1998 Appropriated Value/FY 1999 President's Budget:			
a. Deferral of phased array development.		0	-4.4
b. Minor pricing adjustment	-.1		
c. Below Threshold Reprogramming	2.5		1.0
FY 2000/01 PRES Budget Submit:	6.0	2.9	2.0

(U) Change Summary Explanation:

Funding:

1) FY98 funding increase of $2.0M for High Data Rate (HDR) antenna unfunded requirements and $.5 for SADS from X1411.
2) FY99 SADS program delayed to fund emergent higher priority requirements. Funds reallocated to Transition Engineering as higher priority effort.
3) FY00/01 funding decrease of $4.4M and $4.6M deferred phased array development two years due to budget constraints.
4) FY00 funding increase of $1.0M to Antenna Transition Engineering for development of enhanced sensitivity on antenna systems.

Schedule:

1) SADS: 4QFY98 MS II A (LRIP) DTIIA/OT IIA deleted as LRIP is not required. Completed design and technical documentation. MSIIB deleted due to clarification of MSII ADM. 1QFY99 MSIII delayed to 3QFY99 due to program delay. All SADS program milestones reflect program delay.
2) HDR: Contract delivery of the Rapid Prototype (RP) development system delayed the first Production System award and delivery. All milestones have been adjusted to reflect impact of these schedule delays.
3) OE-538/BRC: Awarding contract delayed from July 97 to Sept 97 causing a one quarter delay in applicable milestones. OE-538/BRC OT-IIB testing continued into FY 1997 requiring redesign/test prior to MS III Decision. Due to testing considerations, MS III was changed to MSIIA (2QFY97) authorizing LRIP and deferring MSIII until FY 1999. Due to LRIP delayed delivery, MSIII is changed to MSIIB (2QFY99) and is deferred until FY2000.

Technical: Not applicable.

Exhibit R-2a, RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/5	Program Element Name & No. 0604503N Submarine System Equipment Development	Project Name and Number. Submarine Integrated Antenna System/ X0742

B. (U) Other Program Funding Summary:

FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Complete	Total Cost
41.5	60.3	85.4	68.0	68.3	77.4	85.7	104.1	CONT.	CONT.

OPN Line 313000 Hardware and 313005 Installation (Full)

RELATED RDT&E:

PE 0602232N (Space and Electronic Warfare (SEW) Technology)
PE 0303109N (Satellite Communications) – Provides for the EHF transmitter and receiver that utilizes the antenna developed under this program.

C. (U) Acquisition Strategy:

	FY1998	FY1999	FY2000	FY2001
Program Milestones	3Q HDR MSIIA (LRIP)	2Q OE-538/BRC MSIIB	4Q HDR MSIII 1Q OE-538/BRC MSIII 3Q SADS MSIII	
Engineering Milestones				
T&E Milestones	3Q HDR DTII 4Q OE-538/BRC DTIIE	2Q OE-538/BRC DTIIF/OTIIC	3Q HDR DT/OT II 2Q SADS DTIIB/OTIIC	
Contract Milestones	3Q HDR LRIP	2Q HDR (LRIP)*	2Q HDR (LRIP)* 1Q OE-538 (FRP) 3Q SADS(FRP)	2Q HDR (FRP)

* MS II decision for 9 LRIPs in FY 99 and 13 in FY 00.

D. (U) Schedule Profile: See paragraph C above

Exhibit R-3 Cost Analysis		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/5	PROGRAM ELEMENT NAME AND NUMBER Submarine System Equipment Development / 0604503N	PROJECT NAME AND NUMBER Submarine Integrated Antenna System / X0742

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date	FY01 Cost	FY01 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Hardware Development	CPFF	Raytheon Marlboro, MA	3.8	0	N/A	0	N/A	0	N/A	0	13.5	13.7
Hardware Development	WX	NUWC Newport, RI	.8	.9	N/A	.4	TBD	.4	TBD	.8	2.8	N/A
Software Development	Various	Various	.2	.05	various	.08	various	.05	various	N/A	N/A	N/A
Systems Engineering	Various	Various	.4	.8	various	1.3	various	.3	various	N/A	N/A	N/A
Site Platform Integration	Various	Various	.1	.1	various	0	various	.08	various	N/A	N/A	N/A
Subtotal Product Development			5.3	1.9		1.8		.8			6.4	
Remarks:												
Integrated Logistics Support	Various	Various	.2	.05	various	0	various	.05	various	N/A	N/A	N/A
Subtotal Support			.2	.05		0		.05				
Remarks:												

Exhibit R-3 Cost Analysis		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/5	PROGRAM ELEMENT NAME AND NUMBER Submarine System Equipment Development / 0604503N	PROJECT NAME AND NUMBER Submarine Integrated Antenna System / X0742

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date	FY01 Cost	FY01 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Development/Operational T&E	Various	Various	.1	.7	various	.1	various	.03	various	N/A	.93	N/A
Subtotal T&E			.1	.7		.1		.03			.93	
Remarks:												
Project Management Support	Various	Various	.4	.2	various	.1	various	.1	various	N/A	N/A	N/A
Subtotal Management			.4	.2		.1		.1			.	
Remarks:												
Total Cost			6.0	2.9		2.0		1.0		.		
Remarks:												

Exhibit R-2a, RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/5	Program Element Name & No. 0604503N Submarine System Equipment Development	Project Name and Number. Submarine Tactical Communication System / X1411

Cost ($ in Millions)	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Submarine Tactical Communication System/ X1411	4.7	7.5	5.8	5.0	9.7	5.6	5.4	5.5	Continuing	Continuing
RDT&E Articles Qty	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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).

(U) Program Accomplishments and Plans:

1. (U) FY 1998 Accomplishments:
   - (U) ($4.1) SCSS - Continued Design of FY99 Phase of SCSS (Phase II). SBCS IRM and System Integration.
   - (U) ($.5) MIDS – Engineering/Integration and Development testing of MIDS/JTIDS
   - (U) ($.1) Developed and updated Naval Command, Control, Communications, Computers, Intelligence, Sensors, and Reconnaissance (C4SIR) implementation guidance.

2. (U) FY 1999 Plan:
   - (U) ($4.7) SCSS – Complete Integration of FY99 Phase of SCSS (Phase II). Conduct landbased testing of FY99 Phase of SCSS (Phase II). Commence planning and design of FY01 Phase of SCSS (Phase III).
   - (U) ($2.8) Continue integration and development testing for MIDS/JTIDS.

3. (U) FY 2000 Plan:
   - (U) ($4.5) SCSS – complete design of FY01 Phase of SCSS (Phase III). Start Integration of FY01 Phase of SCSS (Phase III). Start planning and design of FY03 Phase of SCSS (Phase IV)

Exhibit R-2a, RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/5	Program Element Name & No. 0604503N Submarine System Equipment Development	Project Name and Number. Submarine Tactical Communication System / X1411

- (U) ($1.3) MIDS – Continue integration and development testing for MIDS/JTIDS

(U) Program Change Summary:

	FY 1998	FY 1999	FY 2000
FY 1999 President's Budget:	5.4	7.6	5.9
Appropriated Value:	5.4	7.6	
Adjustment to FY 1998 Appropriated Value/FY 1999 President's Budget:			
a. minor pricing adjustments	-.7	-.1	-.1
FY 2000/01 PRES Budget Submit:	4.7	7.5	5.8

(U) Change Summary Explanation:

Funding:
1.) FY1998 decrease of $.2M for minor pricing adjustments and $.5M reprogrammed to X0742.
2.) FY1999 decrease of $.1M for minor pricing adjustments.
3.) FY2000 decrease of $.1M for minor pricing adjustments.

Schedule: Not applicable.

Technical: Not applicable.

B. (U) Other Program Funding Summary:

FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Complete	Total Cost
41.5	64.6	86.8	69.2	65.5	78.9	87.5	106.4	CONT	CONT

OPN Line 313000 Hardware and 313005 Installation (Full)

RELATED RDT&E:

PE 0204163N (Fleet Communications)
PE 0602232N (Space & Electronic Warfare (SEW) Technology)

Exhibit R-2a, RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/5	Program Element Name & No. 0604503N Submarine System Equipment Development	Project Name and Number. Submarine Tactical Communication System / X1411

C. (U) Acquisition Strategy: SCSS transforms multiple suites of class-specific, closed system equipment to a common submarine suite incorporating OSA communications equipment. The transition from today's existing submarine radio room to a hybrid SCSS should be completed within a 10-year period. The strategy makes use of common OSA and NDI acquisitions while actively seeking industry participation during the requirements definition and procurement process. SCSS strategy leverages emerging technologies and the implementation of block upgrades on a periodic basis that produces incremental integration of P3I and COTS systems.

SCSS will:
Apply a systems approach to design and implementation of JMCOMS.
Maximize use of COTS products and emerging technologies.
Use existing software modules as feasible.

	FY1999	FY2000	FY2001
Program Milestones			2Q MSII (LRIP) 3Q DT/OT-IIC
Engineering Milestones			
T&E			
Contract Milestones			3Q LRIP

D. (U) Schedule Profile: See paragraph C

Exhibit R-3 Cost Analysis		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/5	PROGRAM ELEMENT NAME AND NUMBER Submarine System Equipment Development / 0604503N	PROJECT NAME AND NUMBER Submarine Tactical Communication System / X1411

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date	FY01 Cost	FY01 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Hardware Development	CPFF	SSC-SD San Diego, CA	.7	.8	10/98	.6	TBD	.5	TBD	1.8	4.4	
Software Development	CPFF	SSC-SD San Diego, CA	.3	.5	10/98	.5	TBD	.5	TBD	2.5	5.0	
Software Development	WX	NUWC Newport, RI	1.0	2.4	various	1.5	TBD	1.2	TBD	4.7	11.0	N/A
Systems Engineering	Various	Misc. Labs	1.3	1.6	various	1.4	various	1.3	various	N/A	N/A	N/A
Subtotal Product Development			3.8	5.3		4.0		3.5				
Remarks:												
Subtotal Support			0	0		0		0				
Remarks:												

Exhibit R-3 Cost Analysis		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/5	PROGRAM ELEMENT NAME AND NUMBER Submarine System Equipment Development / 0604503N	PROJECT NAME AND NUMBER Submarine Tactical Communication System / X1411

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date	FY01 Cost	FY01 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Development/Operational T&E	Various	Various	.6	1.3	various	1.0	various	.9	various	N/A	N/A	N/A
Subtotal T&E			.6	1.3		1.0		.9				
Remarks:												
Project Management Support	Various	Various	.8	.9	various	.8	various	.6	various	N/A	N/A	N/A
Subtotal Management			.8	.9		.8		.6				
Remarks:												
Total Cost			4.7	7.5		5.8		5.0				
Remarks:												

EXHIBIT R-2, FY 2000 RDT&E,N BUDGET ITEM JUSTIFICATION SHEETDATE:

February 1999

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604504N
PROGRAM ELEMENT TITLE: AIR CONTROL (Eng.)

(U) COST: (Dollars in Thousands)

Project Number & Title	FY 1998 Budget	FY 1999 Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete	Total Program
W0718 Marine Air Traffic Control and Landing Systems (MATCALS)	1,440	894	4,704	3,638	5,404	2,787	1,322	1,259	CONT.	CONT.
W0993 Carrier Air Traffic Control	5,508	1,204	1,795	1,843	1,878	1,917	1,966	2,012	CONT.	CONT.
W1657 Air Traffic Control (ATC) Improvements	1,684	1,887	2,197	2,414	2,479	2,542	2,609	2,671	CONT.	CONT.
W2643 ECARS	0	3,492	0	0	0	0	0	0	CONT.	CONT.
TOTAL	**8,632**	**7,477**	**8,696**	**7,895**	**9,761**	**7,246**	**5,897**	**5,942**	**CONT.**	**CONT.**

Quantity of RDT&E Articles

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

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604504N
PROGRAM ELEMENT TITLE: Air Control (Eng)

PROJECT NUMBER: W0718
PROJECT TITLE: Marine Air Traffic Control and Landing System (MATCALS)

(U) COST: (Dollars in Thousands)

Project Number & Title	FY 1998 Budget	FY 1999 Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete	Total Program
W0718 Marine Air Traffic Control and Landing System (MATCALS)										
	1,440	894	4,704	3,638	5,404	2,787	1,322	1,259	Cont.	Cont.
TOTAL	1,440	894	4,704	3,638	5,404	2,787	1,322	1,259		

Quantity of RDT&E Articles Not applicable.

(U) (U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This program provides 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 (ATCALS) at Navy/Marine Corps (MC) 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 1998 ACCOMPLISHMENTS:
   - (U) ($304K) Investigated software upgrades required for automatic FAA interface for the hand-off of flight data from MATCALS to the FAA. Determined possibility of using Information Technology 21st Century (IT21) technology to integrate/incorporate this capability into MATCALS.
   - (U) ($160K) Developed Version M operational software to correct deficiencies/problems documented by the Fleet Marine Forces (FMF) during Operation Desert Storm, to include ensuring integration with Tactical Digital Information Link (TADIL) B/C systems.
   - (U) ($365K) Initiated studies and investigations to determine sensor, display, and equipment requirements (range, altitude, sensitivity, volume) for Next Generation Marine Air Traffic Control (ATC). Provided review of and input to Operational Requirements Document (ORD).
   - (U) ($374K) Supported the program office in concept development and analysis of alternatives for Next Generation Marine ATC.

- (U) ($130K) Researched on-going efforts within FAA to develop next-generation Flight Data Input/Output and Flight Progress system. Determined specific hardware/software requirements needed for interconnectivity to the MATCALS Flight Progress Data/Strip system.

- (U) ($107K) Determined if NAVAIRSYSCOM, Commandant Marine Corps (CMC), Air Combat Element (ACE), Strike Aircraft Division, or other military command elements are necessary for individual-item FAA flight check certification. Developed a comprehensive certification procedure.

2. (U) FY 1999 PLAN:

- (U) ($376K) Conduct research, investigations, studies/analyses incident to refining requirements of MATCALS Next Generation System for compatibility and interoperability with Common Aviation Command & Control System (CAC2S) and common usage with Navy/Marine Corps (MC) ATC to include: (1) hardware/software requirements and solutions needed to incorporate precision Approach Mode II capability, MC intelligence networks, Cooperative Engagement Capability, and Defense Intelligence Information (DII)/Common Operating Environment (COE)/Information Technology 21st Century (IT21); (2) sensor requirements for both airport surveillance and precision approach; and (3) upgrades to existing displays.

- (U) ($158K) Provide software corrections to Operational and Precision Approach Software. Develop and field software upgrades. Provide documentation for software version releases.

- (U) ($346K) Provide technical/management program office support in development and test of new MATCALS ATC system and software Independent Validation & Verification (IV&V).

- (U) ($14K) Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15 USC 638.

3. (U) FY 2000 PLAN:

-
- (U) ($2373K) Provide test and evaluation in support of Next Generation Marine ATC for: (1) software corrections for identified problems; (2) integration of systems and subsystems.

- (U) ($1081K) Provide studies/analyses, systems integration, and test and evaluation support to incorporate Cooperative Engagement Capability, MC Intelligence Networks and Precision Approach Mode II Capability into MC ATC Next Generation System.

- (U) ($718K) Initiate test and evaluation of new software and hardware development and upgrades (sensors, displays, DII/COE/IT21) for Next Generation System.

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604504N
PROGRAM ELEMENT TITLE: Air Control (Eng)

PROJECT NUMBER: W0718
PROJECT TITLE: Marine Air Traffic Control and Landing System (MATCALS)

- (U) ($370K) Continue technical/management program office support in development and test of new MATCALS ATC system and software IV&V.

- (U) ($162K) Provide software corrections to Operational and Precision Approach Software. Develop and field software upgrades. Provide documentation for software version releases.

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604504N**
PROGRAM ELEMENT TITLE: Air Control (Eng)

PROJECT NUMBER: W0718
PROJECT TITLE: Marine Air Traffic Control and Landing System (MATCALS)

(U) B. PROGRAM CHANGE SUMMARY

	FY 1998	FY 1999	FY 2000
(U) FY 1999 President's Budget:	1,175	1,045	1,058
(U) Appropriated Value:	1,175	1,045	
(U) Adjustments from Pres Budget:	+265	-151	+3,646
(U) FY 2000/2001 DON Budget Submit:	1,440	894	4,704

CHANGE SUMMARY EXPLANATION:

(U) Funding: FY98 net increase ($265 thousand) is due to: a $300 thousand increase reprogrammed from within the program element to continue FAA Hand-off and Flight Check Certification development for MATCALS; a $19 thousand decrease for the Small Business Innovation Research Assessment (SBIR) and a $16 thousand decrease for minor program adjustments. FY99 decrease of $151 thousand is due to Congressional undistributed reductions. FY00 net increase of $3,646 thousand is due to a $3726 thousand increase for studies, analyses, test and evaluation associated with migration of MATCALS to the Next Generation. This increase is partially offset by a decrease of $80 thousand for pricing adjustments.

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604504N PROGRAM ELEMENT TITLE: Air Control (Eng)

PROJECT NUMBER: W0718 PROJECT TITLE: Marine Air Traffic Control and Landing System (MATCALS)

(U) C. OTHER PROGRAM FUNDING SUMMARY

Appn	FY 1998 Budget	FY 1999 Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete
(U) OPN MATCALS-BLI 281500	4,788	12,582	12,412	12,034	14,836	17,661	19,525	19,957	Cont.

Related RDT&E: Not applicable.

(U) D. ACQUISITION STRATEGY: Not Applicable.

(U) E. SCHEDULE PROFILE

	FY 1998	FY 1999	FY 2000	To Complete
(U) Program Milestones: Not applicable.				
(U) Engineering Milestones:		4Q Complete Software (SW) Improvements (Current)	3Q Complete DII/COE/IT21 Analysis	
(U) T&E Milestones:			1Q T&E of SW Improve-ments (Current)	1Q-4Q T&E of Hardware (HW)/SW (Next Gen)
(U) Contract Milestones: Not applicable.				

EXHIBIT R-3, FY 2000 RDT&E,N COST ANALYSIS

DATE: February 1999

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604504N

PROJECT NUMBER: W0718
PROJECT TITLE: Marine Air Traffic Control and Landing System (MATCALS)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date		Cost to Complete	Total Cost	Target Value of Contract
Product Development	Various	Various	979	158		162			Cont.		
Subtotal Project Development			**979**	**158**		**162**			**Cont.**		
Remarks: Prior Years includes FY 97 and FY 98 data; program transferred from SPAWAR in FY 97, therefore earlier data is not available.											
Next Generation Studies	Various	NAWCAD	776	376		1,081					
ETS/Studies (Misc)	Various	Various	871	346		370			Cont.		
Subtotal Support			**1,647**	**722**		**1,451**			**0**	**0**	
Remarks: Prior Years includes FY 97 and FY 98 data; program transferred from SPAWAR in FY 97, therefore earlier data is not available											
Next Generation T&E	Various	NAWCAD				3,091					
Subtotal Test & Evaluation			**0**	**0**		**3,091**			**0**	**0**	
Remarks:											
Subtotal Management			**0**	**0**		**0**		**0**	**0**	**0**	
SBIR Assessment				**14**							
Remarks:											
Total Cost			**2,626**	**894**		**4,704**			**0**	**0**	

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET DATE: February 1999

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604504N** **PROJECT NUMBER: W0993**
PROGRAM ELEMENT TITLE: AIR CONTROL (Eng.) **PROJECT TITLE: CARRIER AIR TRAFFIC CONTROL**

(U) COST: (Dollars in Thousands)

Project Number & Title	FY 1998 Budget	FY 1999 Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete	Total Program
W0993 CARRIER AIR TRAFFIC CONTROL	5,508	1,204	1,795	1,843	1,878	1,917	1,966	2,012	CONT.	CONT.
TOTAL	**5,508**	**1,204**	**1,795**	**1,843**	**1,878**	**1,917**	**1,966**	**2,012**	**CONT.**	**CONT.**

Quantity of RDT&E Articles

(U) A. 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 limitations 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 and in the AN/SPN-35B precision approach radar. The AN/SPN-42T is a pilot certification trainer with obsolescence problems, which will be resolved by integration of AN/SPN-46 technology. The AN/SPN-46 radar currently functions in cooperation with an active beacon on the controlled aircraft, and this beacon also has an obsolescence problem. Passive Point Source (PPS) development will replace the beacon. Performance Support Systems (PSS) tailored to specific air control systems, such as AN/SPN-43, AN/SPN-35 and AN/SPN-46, are required to improve the performance of system maintainers. PSS includes supplemental training, technical references and logistics information.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1998 ACCOMPLISHMENTS:

- (U) ($200) Continued AN/SPN-43 MTD development.
- (U) ($2,608) Provided systems engineering support, test & evaluation for AN/SPN-46 and AN/SPN-43 MTD.
- (U) ($708) Continued Passive Point Source development.
- (U) ($1,065) Continued development of AN/SPN-42T systems upgrades.
- (U) ($927) Initiated development of AN/SPN-35 MTD capability.

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604504N** **PROJECT NUMBER: W0993**
PROGRAM ELEMENT TITLE: AIR CONTROL (Eng.) **PROJECT TITLE: Carrier Air Traffic Control**

2. (U) FY 1999 PLAN:

- (U) ($210) Continue systems engineering, test & evaluation for Passive Point Source and AN/SPN-46, AN/SPN-35 and AN/SPN-43 MTD systems.
- (U) ($200) Develop production prototype for Passive Point Source.
- (U) ($617) Develop production prototype for AN/SPN-43 MTD.
- (U) ($100) Initiate development of performance support system for AN/SPN-43.
- (U) ($50) Continue development of AN/SPN-42T systems upgrades.
- (U) ($27) Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15 USC 638.

3. (U) FY 2000 PLAN:

- (U) ($723) Continue systems engineering, test & evaluation for Passive Point Source and AN/SPN-42T upgrade.
- (U) ($100) Complete development of AN/SPN-43 performance support system.
- (U) ($500) Initiate prototype development for AN/SPN-42T upgrade.
- (U) ($72) Initiate development of performance support system for AN/SPN-35.
- (U) ($400) Initiate development of halyard protection for AN/SPN-43.

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604504N** **PROJECT NUMBER: W0993**
PROGRAM ELEMENT TITLE: AIR CONTROL (Eng.) **PROJECT TITLE: Carrier Air Traffic Control**

(U) B. PROGRAM CHANGE SUMMARY

	FY 1998	FY 1999	FY 2000
(U) FY 1999 President's Budget:	6,528	1,260	1,826
(U) Appropriated Value:	6,741	1,260	
(U) Adjustments from President's Budget:	-1,020	-56	-31
(U) FY 2000 President's Budget Submit:	5,508	1,204	1,795

CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1998 decrease of $1,020 thousand includes decreases of $166 thousand for Small Business Innovation Research (SBIR), $781 thousand in reprogrammings for Air Traffic Control Improvements (W1657) and MATCALS (W0718), and $73 thousand in reprogrammings for other Navy priorities. FY 1999 decrease of $56 thousand is the result of Congressional undistributed reductions. FY 2000 decrease of $31 thousand reflects minor pricing adjustments.

(U) Schedule: FY 1998 funding adjustments have impacted AN/SPN-42T upgrade development schedule, delaying it by one year.

(U) Technical: Not applicable.

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604504N** **PROJECT NUMBER: W0993**
PROGRAM ELEMENT TITLE: AIR CONTROL (Eng.) **PROJECT TITLE: Carrier Air Traffic Control**

(U) C. OTHER PROGRAM FUNDING SUMMARY

Appn	FY 1998 Budget	FY 1999 Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete
1810 Automatic Carrier Landing System - 42PN	11,020	10,053	19,440	18,832	16,750	18,477	18,938	19,328	CONT.
1810 Shipboard Air Traffic Control - 42MP	3,605	8,552	7,543	8,095	8,360	8,415	8,625	8,802	CONT.

Related RDT&E
(U) P.E. 0603512N (Carrier Systems Development)
(U) P.E. 0604512N (Shipboard Aviation Systems)

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604504N** **PROGRAM ELEMENT TITLE: AIR CONTROL (Eng.)** **PROJECT NUMBER: W0993** **PROJECT TITLE: Carrier Air Traffic Control**

(U) D. ACQUISITION STRATEGY:

All projects are non-ACAT upgrades to existing systems. An evolutionary acquisition approach is being used to introduce technology advancements that either satisfy user requirements (all weather operation) or address supportability and cost of ownership problems.

(U) E. SCHEDULE PROFILE

	FY 1998	FY 1999	FY2000	TO COMPLETE
(U) Program Milestones			4Q SPN-43 PSS Software Release	1Q/FY01 SPN-35PSS Software Release
(U) Engineering Milestones	1Q SPN-43 MTD Prototype	4Q PPS Prototype 4Q SPN-43 MTD Production Prototype	3Q PPS Production Prototype	
(U) T&E Milestones	2Q-4Q SPN-46/43 MTD Testing 1Q-2Q PPS Testing	1Q-2Q PPS Testing 4Q SPN-35 MTD Testing 3Q-4Q SPN-43 MTD Testing	4Q PPS Testing	1Q/FY01 PPS Testing
(U) Contract Milestones		2Q SPN-46 MTD Production	2Q SPN-35 MTD Production	2Q/FY01 SPN-43 MTD Production

EXHIBIT R-3, FY 2000 RDT&E,N COST ANALYSIS

DATE: February 1999

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604504N

PROJECT NUMBER: W0993

PROJECT TITLE: Carrier Air Traffic Control

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Project Development (Misc.)	WX	NAWCAD Pax River, MD	22,104	1,013		1,525		CONT.	CONT	
Subtotal Project Development			**22,104**	**1,013**		**1,525**		**CONT.**	**CONT.**	
Remarks:										
Subtotal Support										
Remarks:										
Cost categories: T&E (Misc.)	WX	NAWCAD Pax River, MD	739	80		100		**CONT.**	**CONT.**	
Subtotal Test & Evaluation			**739**	**80**		**100**		**CONT.**	**CONT.**	
Remarks:										
Management (Misc.)	Various	NAWCAD Pax River, MD	589	84		170		**CONT.**	**CONT.**	
Subtotal Management			**589**	**84**		**170**		**CONT.**	**CONT.**	
SBIR Assessment				**27**						
Remarks:										
Total Cost			**23,432**	**1,204**		**1,795**		**CONT.**	**CONT.**	

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604504N** **PROJECT NUMBER: W1657**
PROGRAM ELEMENT TITLE: AIR CONTROL (Eng.) **PROJECT TITLE: Air Traffic Control Improvements**

(U) COST: (Dollars in Thousands)

Project Number & Title	FY 1998 Budget	FY 1999 Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete	Total Program
W1657 AIR TRAFFIC CONTROL IMPROVEMENTS	1,684	1,887	2,197	2,414	2,479	2,542	2,609	2,671	CONT.	CONT.
TOTAL	**1,684**	**1,887**	**2,197**	**2,414**	**2,479**	**2,542**	**2,609**	**2,671**	**CONT.**	**CONT.**

Quantity of RDT&E Articles

(U) A. 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). Performance Support Systems (PSS) tailored to specific air control systems, such as AN/SPN-41 and AN/TPX-42, are required to improve the performance of system maintainers. PSS includes supplemental training, technical references and logistics information.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1998 ACCOMPLISHMENTS:

- (U) ($570) Continued development of Global Positioning System (GPS) data link/landing system.
- (U) ($60) Completed development of AN/SPN-41 performance support system.
- (U) ($754) Provided systems engineering support for development of GPS data link/landing system and AN/SPN-41 performance support system.
- (U) ($300) Initiated engineering development for NAS Modernization.

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604504N** **PROJECT NUMBER: W1657**
PROGRAM ELEMENT TITLE: AIR CONTROL (Eng.) **PROJECT TITLE: Air Traffic Control Improvements**

2. (U) FY 1999 PLAN:

- (U) ($250) Complete development of GPS data link/landing system.
- (U) ($507) Provide systems engineering support to complete evaluation of GPS data link/landing system.
- (U) ($300) Initiate development of AN/TPX-42 computer upgrade.
- (U) ($300) Continue engineering development for NAS Modernization.
- (U) ($500) Initiate development of an Automatic Carrier Landing System (ACLS) Improvements upgrade.
- (U) ($30) Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15 USC 638.

3. (U) FY 2000 PLAN:

- (U) ($65) Initiate development of AN/TPX-42 performance support system.
- (U) ($200) Complete development on AN/TPX-42 computer upgrade.
- (U) ($1,000) Continue development of ACLS Improvements upgrades.
- (U) ($632) Provide systems engineering support for ACLS Improvements upgrade.
- (U) ($300) Continue engineering development for NAS Modification.

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604504N PROGRAM ELEMENT TITLE: AIR CONTROL (Eng.) PROJECT NUMBER: W1657 PROJECT TITLE: Air Traffic Control Improvements

(U) B. PROGRAM CHANGE SUMMARY

	FY 1998	FY 1999	FY 2000
(U) FY 1999 President's Budget:	1,244	1,893	2,236
(U) Appropriated Value:	1,297	1,893	
(U) Adjustments from President's Budget:	+440	-6	-39
(U) FY 2000/2001 President's Budget Submit:	1,684	1,887	2,197

CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1998 increase of $440 thousand includes: a $461 thousand increase due to reprogrammings from Carrier ATC (W0993); a $3 thousand decrease for Small Business Innovation Research (SBIR), and an $18 thousand decrease for pricing adjustments. FY 1999 decrease of $6 thousand reflects Congressional undistributed reductions. FY 2000 decrease of $39 thousand reflects pricing adjustments.

(U) Schedule: Not applicable.
(U) Technical: Not applicable.

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604504N** **PROJECT NUMBER: W1657**
PROGRAM ELEMENT TITLE: AIR CONTROL (Eng.) **PROJECT TITLE: Air Traffic Control Improvements**

(U) C. OTHER PROGRAM FUNDING SUMMARY

Appn	FY 1998 Budget	FY 1999 Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete
1810 National Air Space System - 42CB	2,200	7,985	35,115	36,675	52,260	37,815	38,759	22,679	CONT.
1810 Shipboard Air Traffic Ctrl - 42MP	3,605	8,552	7,543	8,095	8,360	8,415	8,625	8,802	CONT.

Related RDT&E
(U) Not applicable.

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604504N** **PROJECT NUMBER: W1657**
PROGRAM ELEMENT TITLE: AIR CONTROL (Eng.) **PROJECT TITLE: Air Traffic Control Improvements**

(U) D. ACQUISITION STRATEGY:

All projects are non-ACAT upgrades to existing systems. An evolutionary acquisition approach is being used to introduce technology advancements that either satisfy user requirements (all weather operation) or address supportability and cost of ownership problems.

(U) E. SCHEDULE PROFILE

	FY 1998	FY 1999	FY 2000	TO COMPLETE
(U) Program Milestones	4Q SPN-41 PSS Software Release			4Q/FY01 TPX-42 PSS Software Release
(U) Engineering Milestones	2Q GPS NAPIE Prototype		2Q TPX-42 Computer Production Prototype 3Q-4Q TPX-42 Computer Testing	
(U) T&E Milestones	3Q-4Q Evaluate GPS NAPIE Prototype	1Q-2Q Evaluate GPS NAPIE Prototype		
(U) Contract Milestones				1Q/FY01 TPX-42 Computer Production

EXHIBIT R-3, FY 2000 RDT&E,N COST ANALYSIS

Date: February 1999

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604504N

PROJECT NUMBER: W1657

PROJECT TITLE: Air Traffic Control Improven

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Porject Development (Misc.)	WX	NAWCAD Pax river Md	33,861	1,502		1,827		CONT>	CONT>	
		SPAWAR San Diego, CA		180		60				
Subtotal Project Development			**33,861**	**1,682**		**1,887**		**CONT.**	**CONT.**	
Remarks:										
Subtotal Support										
Remarks:										
T & E (Misc.)	WX	NAWCAD Pax River, MD	2,138	100		120		CONT.	CONT.	
Subtotal Test & Evaluation			**2,138**	**100**		**120**		**CONT.**	**CONT.**	
Remarks:										
Management Support (Misc.)	Various	NAWCAD Pax River, MD	2,633	75		190		CONT.	CONT.	
Subtotal Management			**2,633**	**75**		**190**		**CONT.**	**CONT.**	
SBIR				**30**						
Remarks:										
Total Cost			**38,632**	**1,887**		**2,197**		**CONT.**	**CONT.**	

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5 | **PROGRAM ELEMENT: 0604504N** | **PROGRAM ELEMENT TITLE: AIR CONTROL (Eng.)** | **PROJECT NUMBER: W2643** | **PROJECT TITLE: Expeditionary Common Automatic Recovery System (ECARS)**

ECARS

(U) COST: (Dollars in Thousands)

Project Number & Title	FY 1998 Budget	FY 1999 Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete	Total Program
W2643 ECARS	0	3,492	0	0	0	0	0	0	0	0
TOTAL	**0**	**3,492**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Quantity of RDT&E Articles

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The USMC's Marine Air Ground Force (MAGTF) requires the capability to recover Aviation Combat Element (ACE) aircraft and Unmanned Aerial Vehicles (UAVs) reliably in an expeditionary environment. The current landing aid systems are antiquated, require considerable lift and setup time, and are primarily fixed base systems. The objectives of the Expeditionary Common Automatic Recovery System (ECARS) specifically include the development of a landing systems beacon replacement for both manned and unmanned aircraft.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1998 ACCOMPLISHMENTS: Not applicable

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5 | **PROGRAM ELEMENT: 0604504N** | **PROGRAM ELEMENT TITLE: AIR CONTROL (Eng.)** | **PROJECT NUMBER: W2643** | **PROJECT TITLE: Expeditionary Common Automatic Recovery System (ECARS)**

2. (U) FY 1999 PLAN:

- (U) ($1,090) Continue systems engineering, test and evaluation of ECARS.
- (U) ($ 500) Develop a prototype landing system beacon for manned/unmanned aircraft.
- (U) ($1,815) Develop system upgrades for extended range capability.
- (U) ($87) Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15 USC 638.

3. (U) FY 2000 PLAN: Not applicable

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604504N** **PROJECT NUMBER: W2643**
PROGRAM ELEMENT TITLE: AIR CONTROL (Eng.) **PROJECT TITLE: Expeditionary Common Automatic Recovery System (ECARS)**

(U) B. PROGRAM CHANGE SUMMARY

	FY 1998	FY 1999	FY 2000
(U) FY 1999 President's Budget:	0	0	0
(U) Appropriated Value:	0	3,500	0
(U) Adjustments from President's Budget:	0	+3,492	
(U) FY 2000 President's Budget Submit:	0	3,492	0

CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1999 increase of $3,492 includes an increase of $3,500 and an $8 thousand decrease for a minor pricing adjustment.

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604504N
PROGRAM ELEMENT TITLE: AIR CONTROL (Eng.)

PROJECT NUMBER: W2643
PROJECT TITLE: : Expeditionary Common Automatic Recovery System (ECARS)

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

(Related RDT&E
(U) P.E. 0603860F (JPALS)
(U) P.E. 0603860N (JPALS)
(U) P.E. 0603640M (Marine Corps Advanced Technology Demonstrations)

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5 | **PROGRAM ELEMENT: 0604504N** | **PROGRAM ELEMENT TITLE: AIR CONTROL (Eng.)** | **PROJECT NUMBER: W2643** | **PROJECT TITLE: Expeditionary Common Automatic Recovery System (ECARS)**

(U) D. ACQUISITION STRATEGY: Purpose of project is to develop capability demonstrations. Acquisition approach will direct efforts toward providing useful avionics off-the-shelf alternatives.

(U) E. SCHEDULE PROFILE

	TO FY 1998	FY 1999	FY 2000
COMPLETE			
(U) Program Milestones			
(U) Engineering Milestones			
(U) T&E Milestones			
(U) Contract Milestones		3Q Contract Award	

EXHIBIT R-3, FY 2000 RDT&E,N COST ANALYSIS DATE: February 1999

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604504N PROJECT NUMBER: W2643

PROJECT TITLE: Expeditionary Common Automatic Recovery System (ECARS)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Project Development (Misc.)	BOA	NAVAIR Pax River, MD		2,855						
Subtotal Project Development				**2,855**						
Remarks:										
Subtotal Support										
Remarks:										
Test & Evaluation (Misc.)				300						
Subtotal Test & Evaluation				**300**						
Remarks:										
Management Support (Misc.)				250						
Subtotal Management				**250**						
SBIR ASSESSMENT				**87**						
Remarks										
Total Cost				**3492**						

Exhibit R-2, RDT&E Budget Item Justification	Date: February 1999
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/ 05	R-1 ITEM NOMENCLATURE Enhanced Modular Signal Processor/ 0604507N

COST ($ in Millions)	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Total P.E. Cost	1.5	1.5	1.0	1.0	1.2	1.2	1.4	1.4	CONT.	CONT.
Enhanced Modular Signal Processor V1440	1.5	1.5	1.0	1.0	1.2	1.2	1.4	1.4	CONT.	CONT.
Quantity of RDT&E Articles & cost										

A. Mission Description and Budget Item Justification: This program improves Navy Signal Processing Hardware and Software.

PROGRAM ACCOMPLISHMENTS AND PLANS:

1. FY 1998 ACCOMPLISHMENTS:

- ($0.5) Completed Technical Direction Agent (TDA) support for redesign of the Enhanced Modular Signal Processor (EMSP) operating system to allow it to be hosted on Commercial-Off-The-Shelf (COTS) hardware.
- ($0.2) Developed and tested prototype COTS Airborne Enclosure.
- ($0.5) Continued to work with Industry to develop Vector Signal Image Processing (VSIP) and Message Passing Interface/Real Time (MPIRT) standards compatible with Common Operating Environment (COE)/ Tactical Advanced Signal Processor (TASP).
- ($0.3) Developed a Common Signal Processor specification for multiple users.

2. FY 1999 PLAN:

- ($0.785) Continue joint program initiatives to develop and implement a common COTS signal processing solution into AN/SQQ-89, SH-60 Airborne Low Frequency Sonar (ALFS), and P-3 Special Projects systems platforms.
- ($0.725) Continue to work with Industry to develop Vector Signal Imaging Processing (VSIP) and Message Passing Interface/Real Time (MPIRT) standards compatible with Common Operating Environment (COE)/Tactical Advanced Signal Processor (TASP).
- ($0.025) Portion of extramural program is reserved for Small Business Innovation Research assessment in accordance with 15 USC 638.

3. FY 2000 PLAN:

Exhibit R-2, RDT&E Budget Item Justification	Date: February 1999
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/ 05	R-1 ITEM NOMENCLATURE Enhanced Modular Signal Processor/ 0604507N

- ($0.5) Continue joint program initiatives to develop and implement a Common COTS signal processing solution for AN/SQQ-89, SH-60 Airborne Low Frequency Sonar (ALFS), and P-3 Special Projects systems platforms.

- ($0.5) Continue to work with Industry to develop and enhance capabilities/functions for Vector Signal Imaging Processing (VSIP) and Message Passing Interface/Real Time (MPIRT) standards compatible with Common Operating Environment (COE)/Tactical Advanced Signal Processor (TASP).

B. Program Change Summary:

	FY 1998	FY 1999	FY 2000
FY 1999 President's Budget:	2.370	1.599	1.114
Appropriated Value:	2.370	1.599	
Adjustments to FY 1998 Appropriated Value/ FY 1999 President's Budget:			
a. SBIR Realignment	-.057		
b. FY 1998 BTR UPDATE	-1.059		
c. C2 System Program Offset for IT-21			-0.127
d. Minor Pricing Adjustments	+.239	-.064	-0.017
FY 2000 PRES Budget Submit:	1.493	1.535	0.970

Funding: FY98 decrease for SBIR Realignment (-$0.57), BTR Update 98-28 (-$1.059 for Advanced Tactical Data Link System), minor pricing adjustments (+$0.239). FY99 decrease for minor pricing adjustments (-$0.064). FY00 decrease for C2 System Program Offset for IT-21 (-0.127), and minor pricing adjustments (-$.017).

Schedule: Not applicable.
Technical: Not applicable.

C. Other Program Funding Summary

FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Complete	Total Cost

Exhibit R-2, RDT&E Budget Item Justification	Date: February 1999
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/ 05	R-1 ITEM NOMENCLATURE Enhanced Modular Signal Processor/ 0604507N

OPN P1 Line Item 103 (B.L. 298000/C2M7)

1.0	1.2	1.4	1.3	1.3	1.5	2.0	2.2	CONT.	CONT.

D. Acquisition Strategy: a) Complete joint program initiatives to implement a COTS signal processing solution for various user platforms. b) Assist current EMSP user programs to port their EMSP-based application software to COTS. c) Seek industry standard middleware products that isolate Navy application software products from future changes in COTS hardware.

E. Schedule Profile

Exhibit R-2, RDT&E Budget Item Justification	Date: February 1999
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/ 05	R-1 ITEM NOMENCLATURE Enhanced Modular Signal Processor/ 0604507N

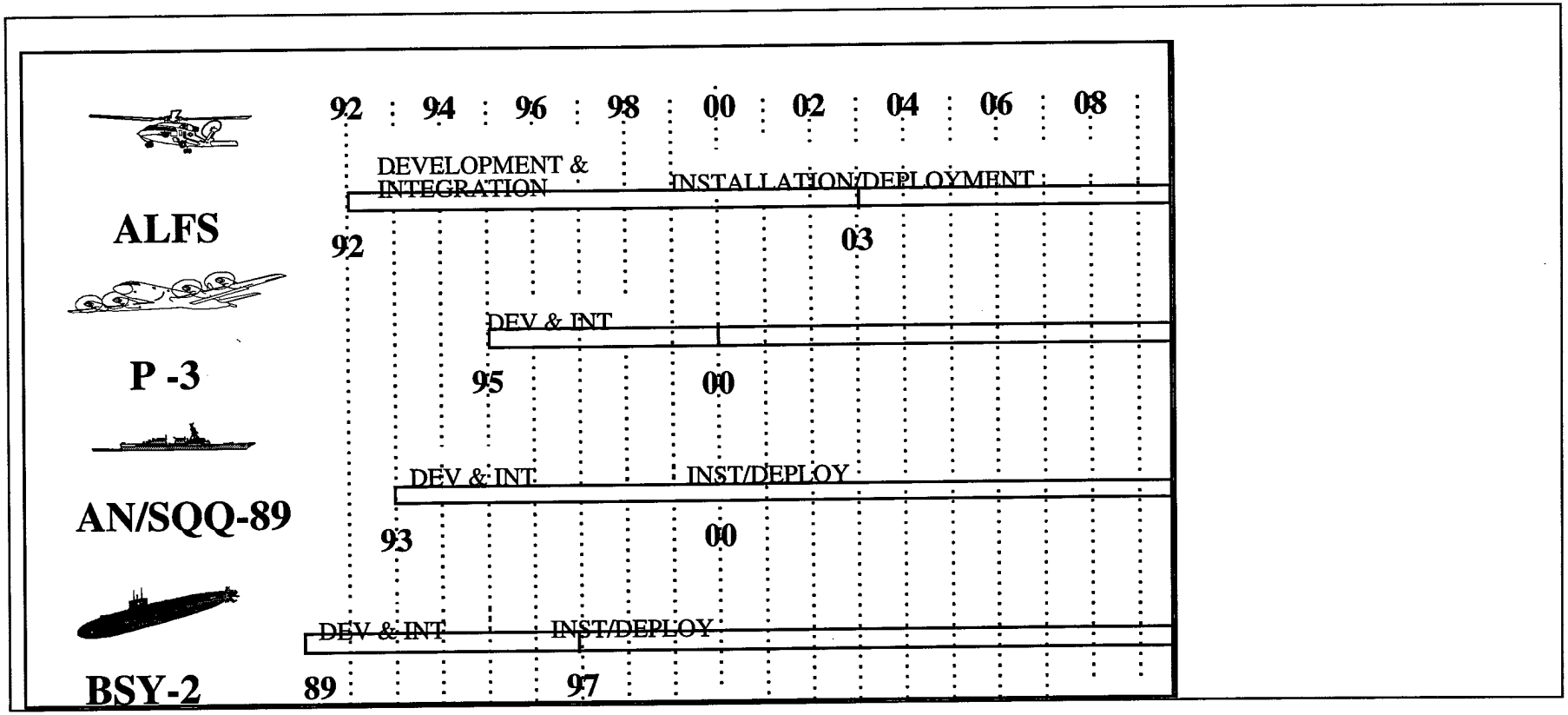


Exhibit R-3 Cost Analysis		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E, N/ 05	Enhanced Modular Signal Processor/ 0604507N	

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date			Cost To Complete	Total Cost	Target Value of Contract
Software Development	WR/RCP	Misc.	1.6	0.8	Var.	0.5	Var.		.	CONT.	CONT.	
Subtotal Product Development			1.6	0.8		0.5				CONT.	CONT.	
Remarks:												
Development Support Equipment												
Software Engineering Support	WR	NAWC, Pax River	2.2	0.4	10/98	0.3	10/99			CONT.	CONT.	
Miscellaneous Support/Travel	PD/Var.	Various		0.2	Var.	0.1	Var.		.	CONT.	CONT.	
Subtotal Support			2.2	0.6		0.4				CONT.	CONT.	
Remarks:												

Exhibit R-3 Cost Analysis		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E, N/ 05	Enhanced Modular Signal Processor/ 0604507N	

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date			Cost To Complete	Total Cost	Target Value of Contract
Subtotal T&E			0	0		0				0	0	
Remarks:												
Program Management Support	CPFF	TWD, VA	1.9	0.1	Var.	0.1	Var.			CONT.	CONT.	
Subtotal Management			1.9	0.1		0.1				CONT.	CONT.	
Remarks:												
Total Cost			5.7	1.5		1.0				CONT.	CONT.	
Remarks:												

EXHIBIT R-2, FY 2000 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604512N
PROGRAM ELEMENT TITLE: Shipboard Aviation Systems

(U) COST: (Dollars in Thousands)

Project Number & Title	FY 1998 Budget	FY 1999 Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete	Total Program
W2232 CV Launch and Recovery Systems										
TOTAL	**8,774**	**8,430**	**9,052**	**9,975**	**8,950**	**9,170**	**6,820**	**7,106**	**CONT.**	**CONT.**
Quantity of RDT&E Articles	5		4			1		1		

(U) A. 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 is funded under E&MD because it encompasses engineering and manufacturing development of new end-items prior to production approval decision. This program includes the E&MD phase of the following systems under Project W2232, including the funding of engineering development models (EDM):

- (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).
- (U) The Aviation Data Management and Control System (ADMACS), including the Integrated Shipboard Information System (ISIS), the Advanced Launch and Recovery Control System (ALRCS), and the Virtual Imaging System for Approach and Landing (VISUAL) increments.
- (U) MORIAH, the integrated wind measurement and meteorological system.
- (U) The Shipboard Optical Landing System (SOLS).

(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.

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5 | **PROGRAM ELEMENT: 0604512N** | **PROGRAM ELEMENT TITLE: Shipboard Aviation Systems** | **PROJECT NUMBER: W2232** | **PROJECT TITLE: CV Launch & Recovery Sys**

(U) COST: (Dollars in Thousands)

Project Number & Title	FY 1998 Budget	FY 1999 Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete	Total Program
W2232 CV Launch and Recovery Systems										
TOTAL	**8,774**	**8,430**	**9,052**	**9,975**	**8,950**	**9,170**	**6,820**	**7,106**	**CONT.**	**CONT.**
Quantity of RDT&E Articles	5		4		1		1			

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This Navy unique project 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 is funded under E&MD because it encompasses engineering and manufacturing development of new end-items prior to production approval decision. This program includes the E&MD phase of the following systems, including the funding of engineering development models (EDM):

- (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), provide longer range, higher accuracy visual landing aids (VLA) for pilots landing on aircraft carriers.
- (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, ALRCS, and VISUAL; and links Air Operations with other onboard tactical and support networks.
- (U) The Integrated Shipboard Information System (ISIS) employs 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 Advanced Launch and Recovery Control System (ALRCS) introduces modern, modularized computer control systems to the catapults and arresting gear on aircraft carriers, which will support Condition Based Maintenance (CBM), enhance performance, and reduce life cycle costs.
- (U) MORIAH integrates standardized digital wind and meteorological (METOC) sensors to produce an affordable, LAN compatible, wind METOC suite for all classes of air capable Navy ships.

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604512N** **PROJECT NUMBER: W2232**
PROGRAM ELEMENT TITLE: Shipboard Aviation Systems **PROJECT TITLE: CV Launch & Recovery Sys**

- (U) The Virtual Imaging System for Approach and Landing (VISUAL) provides ship's force and pilots with enhanced images of the aircraft and ship, respectively, in low visibility, day 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.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. FY 1998 ACCOMPLISHMENTS:

- (U) ($ 421) Conducted Technical Evaluation (TECHEVAL) of the ICOLS/LRLS non-stabilized unit (EDM #2) at NAS Lemoore, prior to the TECHEVAL of the stabilized unit (EDM #1) on USS CARL VINSON (CVN 70). Completed documentation for Milestone (MS) III decision to proceed to Full Rate Production (FRP). Conducted MS III decision to proceed to FRP of the ICOLS/LRLS. Provided pre-production support for the unit installed on USS CARL VINSON (CVN 70). Provided engineering and management support to the program, particularly for the transition from the E&MD phase to the production phase.
- (U) ($ 990) Conducted Operational Evaluation (OPEVAL) of the ICOLS/IFLOLS on USS GEORGE WASHINGTON (CVN 73). Prepared documentation for MS III decision to proceed to FRP. Provided pre-production support for the unit installed on USS GEORGE WASHINGTON (CVN 73). Provided engineering and management support to the program, particularly for the transition from the E&MD phase to the production phase.
- (U) ($4,698) Completed design and integration of the CV/CVN variant of the ISIS EDM for installation on USS THEODORE ROOSEVELT (CVN 71). Completed installation and check-out of the ISIS EDM on USS THEODORE ROOSEVELT (CVN 71) and started TECHEVAL. Initiated preparation of documentation for MS III decision to proceed to Low Rate Initial Production (LRIP). Provided pre-production support for the unit installed on USS THEODORE ROOSEVELT (CVN 71) and the ISIS ADM installed on USS GEORGE WASHINGTON (CVN 73). Provided engineering and management support to the program. CV/CVN ISIS EDM for CVN 71 funded under this sub-project.
- (U) ($2,228) Completed design and integration of the CV/CVN variant of the ADMACS/ISIS EDM for installation on USS GEORGE WASHINGTON (CVN 73) and conduct Critical Design Review (CDR) with Fleet users to validate the ADMACS/ISIS EDM design. Started installation of the ADMACS/ISIS EDM on USS GEORGE WASHINGTON (CVN 73). Initiated preparation of documentation for MS III decision to proceed to LRIP. Provided integration support for the various ADMACS increments under development. Provided engineering and management support to the program. CV/CVN ADMACS/ISIS EDM for CVN 73 funded under this sub-project.
- (U) ($ 437) Initiated design of the MORIAH wind/METOC system and completed draft system performance specification. Completed documentation for MS II decision to proceed to the E&MD phase. Conducted MS II decision to proceed to the E&MD phase of MORIAH. Initiated fabrication of the MORIAH EDMs. Provided engineering and management support to the program. Three MORIAH EDMs are funded under this sub-project.

BUDGET ACTIVITY: 5
PROGRAM ELEMENT: 0604512N
PROGRAM ELEMENT TITLE: Shipboard Aviation Systems
PROJECT NUMBER: W2232
PROJECT TITLE: CV Launch & Recovery Sys

2. FY 1999 PLAN:

- (U) ($ 400) Complete outstanding ICOLS/IFLOLS OPEVAL issues, if any. Complete documentation for MS III decision to proceed to FRP. Conduct MS III decision to proceed to FRP 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 MS III decision to proceed to LRIP. Conduct MS III to proceed to LRIP of the CV/CVN Variant of ADMACS/ISIS. 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.

- (U) ($2,600) 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 WASHIGNTON (CVN 73). Prepare documentation for In-Process Review (IPR) to proceed to FRP. Conduct IPR decision to proceed to FRP of the CV/CVN Variant of ADMACS/ISIS. 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) Complete documentation for MS II decision to proceed to the E&MD phase of ALRCS. Conduct MS II decision to proceed to the E&MD phase of the ALRCS EDM. Initiate the design of the ALRCS EDM. Complete Allocated Baseline Specifications and initiate detailed system/component specification and drawing development. Provide engineering and management support to the program.

- (U) ($1,867) Complete documentation for MS II decision to proceed to the E&MD phase of the LHA/LHD variant of the ADMACS/ISIS. Conduct MS 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) ($ 700) 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.

- (U) ($ 15) Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15 USC 638.

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604512N
PROGRAM ELEMENT TITLE: Shipboard Aviation Systems

PROJECT NUMBER: W2232
PROJECT TITLE: CV Launch & Recovery Sys

3. FY 2000 PLAN:

- (U) ($2,300) Design, procure, and integrate selected sensors and subsystem prototypes of the ALRCS EDM. Provide engineering and management support to the program. ALRCS EDM funded under this sub-project.
- (U) ($2,800) Continue the design and integration of the LHA/LHD variant of the ADMACS/ISIS EDM. Complete installation and check-out of the LHA/LHD variant of the ADMACS EDM. Provide engineering and management support to the program. LHA/LHD ADMACS/ISIS EDM funded under this sub-project.
- (U) ($ 320) Complete TECHEVAL of the MORIAH EDM and conduct an Operational Assessment (OA). Complete documentation for MS III decision to proceed to LRIP. Conduct MS III decision to proceed to LRIP of the MORIAH. Award LRIP contract to manufacture MORIAH production systems. Conduct OPEVAL of the MORIAH EDM. Prepare documentation for IPR to proceed to FRP. Provide engineering and management support to the program.
- (U) ($3,632) Complete documentation for MS II decision to proceed to E&MD. Conduct Milestone II decision to proceed to the E&MD phase of the VISUAL EDM. Award contract to initiate the design and integration of the VISUAL EDM. Provide engineering and management support to the program. CV/CVN VISUAL EDM funded under this subproject.

DATE: February 1999

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604512N
PROGRAM ELEMENT TITLE: Shipboard Aviation Systems

PROJECT NUMBER: W2232
PROJECT TITLE: CV Launch & Recovery Sys

(U) B. PROGRAM CHANGE SUMMARY

	FY 1998	FY 1999	FY 2000
(U) FY 1999 President's Budget:	8,931	8,531	9,213
(U) Appropriated Value:	8,931	8,531	
(U) Adjustments from President's Budget:	-157	-101	-161
(U) FY 2000 President's Budget Submit:	8,774	8,430	9,052

CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1998 decrease of $157 thousand reflects $33 thousand for the Small Business Innovation Research (SBIR) assessment and $124 thousand for reprogramming for other Navy requirements. FY 1999 decrease of $101 thousand reflects Congressional undistributed reductions. FY2000 decrease of $161 thousand reflects pricing adjustments.

(U) Schedule:

LRLS MS III 2Q/98	LRLS MS III 3Q/98
ADMACS CDR 3Q/98	ADMACS CDR 4Q/98
ALRCS CDR 4Q/99	ALRCS CDR 2Q/00

Milestone changes: The ICOLS / LRLS EDM installation on USS CARL VINSON (CVN 70) was completed in 1Q FY 1998 vs 4Q FY 1997 as a post availability installation due to workload constraints at Puget Sound Naval Ship Yard, delaying DT until 2Q FY 1998. MS III was postponed until 3Q FY 1998 because of technical difficulties with the stabilization platform on CVN 70. ADMACS CDR was delayed one quarter due to staffing problems created by simultaneously planning and installing of EDMs on two aircraft carriers. The ALRCS CDR was delayed from 4Q/99 to 2Q/00 due to an extension of the design and fabrication performance period. All other changes were made to provide additional program details.

(U) Technical: Not applicable

DATE: February 1999

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604512N
PROGRAM ELEMENT TITLE: Shipboard Aviation Systems

PROJECT NUMBER: W2232
PROJECT TITLE: CV Launch & Recovery Sys

(U) C. OTHER PROGRAM FUNDING SUMMARY

Appn	FY 1998 Budget	FY 1999 Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete
OP,N (PE 0204216N, Aircraft Launch and Recovery Equipment)									
	4,692	19,223	19,263	26,728	20,341	20,302	19,587	18,905	35,309

Related RDT&E

(U) P.E. 0603512N (Carrier Systems Development)

BUDGET ACTIVITY: 5 | **PROGRAM ELEMENT: 0604512N** | **PROGRAM ELEMENT TITLE: Shipboard Aviation Systems** | **PROJECT NUMBER: W2232** | **PROJECT TITLE: CV Launch & Recovery**

(U) D. ACQUISITION STRATEGY:

LRLS is a Commercial Off-the-Shelf (COTS) procurement. The Navy prepared a performance specification and competitively awarded a fixed-price contract to deliver 3 EDMs in FY 1997, with fixed-price production options.

IFLOLS is a Technical Data Package (TDP) procurement. The Navy prepared a complete technical data package, based on the EDMs delivered in FY 1997, which will be submitted for bid by Hughes Technical Services in Indianapolis, IN under the BRAC privatization program.

ADMACS/ISIS is being designed and integrated by the Navy. The Navy will be procure COTS hardware/software from multiple sources, integrate the COTS hardware/software, and deliver to Navy shipyards for installation.

MORIAH is a COTS procurement. The Navy is preparing a performance specification, based on the EDMs, and will competitively award a fixed-price contract to deliver production systems.

VISUAL is a COTS procurement. The Navy is preparing a performance specification and will competitively award a fixed-price contract to deliver EDMs, with fixed-price production options.

ALRCS is a teaming procurement with Newport News Shipbuilding. The Navy is preparing a performance specification and the ALRCS Team will integrate and test the system. Production systems will be competitively procured.

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604512N
PROGRAM ELEMENT TITLE: Shipboard Aviation Systems

PROJECT NUMBER: W2232
PROJECT TITLE: CV Launch & Recovery

(U) E. SCHEDULE PROFILE

	FY 1998	FY 1999	FY 2000	To Complete
(U) Program Milestones	LRLS: 3Q MSIII MORIAH: 4Q MSII	IFLOLS: 1Q MSIII CV/CVN ADMACS/ ISIS: 2Q MSIII ALRCS: 2Q MSII LHA/LHD ADMACS/ ISIS: 2Q MSII	MORIAH: 4Q MSIII	
(U) Engineering Milestones	CV/CVN-ADMACS/ ISIS CDR: 4Q MORIAH PDR: 4Q	LHA/LHD ADMACS/ ISIS CDR: 4Q MORIAH CDR: 4Q ALRCS PDR 3Q	ALRCS CDR: 2Q VISUAL CDR: 4Q	
(U) T&E Milestones	IFLOLS OT (10/97 - 04/98) LRLS DT (1/98 - 2/98) ISIS DT (4/98 - 7/98)	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)	MORIAH OT (4/00 - 6/00)	
(U) Contract Milestones	LRLS: 3Q FRP Awd	IFLOLS: 1Q FRP Awd CV/CVN ADMAC/ ISIS: 2Q LRIP Awd	MORIAH: 2Q LRIP Awd VISUAL: 1Q EDM Awd CV/CVN ADMAC/ ISIS: 1Q FRP Awd	MORIAH 1Q FY01 FRP Awd

EXHIBIT R-3, FY 2000 RDT&E,N COST ANALYSIS

DATE: February 1999

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604512N

PROJECT NUMBER: W2232
PROJECT TITLE: CV LAUNCH & RECOVERY

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Design, Manufacturing	WX	NAWCAD - LKE	26,434	8,215	12/31/98	8,852		CONT.	CONT.	
Design, Manufacturing	FP	Raytheon	4,475	-0-	12/96	-0-		4,475	4,475	
Subtotal Product Development			**30,909**	**8,215**		**8,852**		**14,250**	**14,250**	
Remarks:										
ALRE PROGRAM SUPPORT			580	200		200		CONT.	CONT.	
Subtotal Support			**580**	**200**		**200**		**CONT.**	**CONT.**	
Subtotal Test & Evaluation			**0**	**0**		**0**		**0**	**0**	
Remarks:										
Subtotal Management			**0**	**0**		**0**		**0**	**0**	
SBIR ASSESSMENT				15		0				
Remarks:										
Total Cost			**31,489**	**8,430**		**9,052**		**CONT.**	**CONT.**	

Exhibit R-2, RDT&E Budget Item Justification	Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E,N/BA 5	Program Element (PE) Name and No. CIC Conversion/NTDS Improv. / 0604518N Project K1604/U1604

COST ($ in Millions)	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Total P.E. Cost	10.196	4.565	8.126	3.740	0.0	0.0	0.0	0.0	0.0	231.563
Quantity of RDT&E Articles & cost										

A. 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 Systems 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 operability 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 system 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 (C^2P), 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 integrated with SSDS MK 1 and will accommodate extensive use of COTS/NDI/OPEN Systems architecture hardware and firmware.

1. (U) FY 1998 Accomplishments:

- ($2.505) Completed delivery and successfully conducted TECHEVAL in November/December 1997 on CVN 69 (IKE).
- ($2.469) Completed initial operational evaluation testing (2/98) on board CVN 69 (IKE), deficiencies noted and corrective actions taken.
- ($3.106) Completed CSIT on the ACDS Block 1 Level 2.1 (Cooperative Engagement Capability (CEC) Version) and delivered to CV 67 (JFK) and began participation in formal CEC DT events.
- ($1.879) Completed test preparations for ACDS Block 1 Level 2.1.x and began implementations of interoperability deficiencies in order to deliver to the LHD-7 CSACF in 8/98.
- ($.237) Completed system engineering studies and analysis to begin design review process for the SSDS MK1 integration effort.

2. (U) FY 1999 Plan:

- ($2.067) Complete Y2K Compliance issues, continue OPEVAL deficiency corrections, and conduct operational test aboard CV 67 (USS JFK) in summer of FY 99 with CEC Baseline 2.
- ($1.232) Complete ACDS Block 1 Level 2.1.x (CVN-68 and LHD-7) testing and verification.
- ($1.175) Support Battle Group Engineering Testing (BGET) of the CV67 (USS JFK) Battle Group prior to 9/99 deployment. Implement Model 5 Taxonomy software changes, complete testing and begin Link Interoperability Certification.
- ($0.091) Portion of extramural program is reserved for Small Business Innovation Research assessment in accordance with 15 USC 638.

3. (U) FY 2000 Plan:

- ($3.375) Participate in CEC Baseline 2 DT/OT events in support of CEC's TECHEVAL and OPEVAL.
- ($1.930) Correct software and hardware trouble reports associated with shipboard deliveries of ACDS Block 1 Level 2.1.x onboard CVN 68 and LHD 7, and upgrade CV 67, CVN 69 and LHD 1 with current software build.
- ($2.821) Complete Interoperability corrections & conduct a Link Certification, followed by a Battle Group Testing of ACDS Block 1 and CEC Baseline 2.

Exhibit R-2, RDT&E Budget Item Justification	Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E,N/BA 5	Program Element (PE) Name and No. CIC Conversion/NTDS Improv. / 0604518N Project K1604/U1604

B. Program Change Summary:

	FY 1998	FY 1999	FY 2000
FY 1999 President's Budget:	10.943	4.704	4.441
Appropriated Value:	11.325	4.704	
Adjustment to FY 1998 Appropriated Value/			
FY 1999 President's Budget:			
a. Congressional Undistributed Reduction	-0.382		
b. SBIR Reduction	-0.254		
c. BTR Issue	-0.450		
d. Minor Pricing Adjustments	-0.043	-0.139	-0.115
e. Revised Testing Schedule for OPEVAL			+3.800
FY 2000 PRES Budget Submit:	10.196	4.565	8.126

Funding: FY 98 decrease for Congressional undistributed reductions and minor pricing adjustments ($-1.129). FY 99 decrease for minor pricing adjustments ($-.139). FY00 funding increase ($+3.800) for OPEVAL.

Schedule: N/A

Technical: N/A

C. Other Program Funding Summary

	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Complete	Total Cost
O&M,N 07088017N/46N80 Ship System Tactical	16.305	18.908	16.848	16.833	17.158	16.760	17.181	17.612	CONT.	CONT.
OPN 260600 PEO(TSC) CEC Program Office	70.903	81.993	60.494	74.407	155.646	185.456	123.648	124.961	CONT.	CONT.

D. Acquisition Strategy: ACDS Block 1 program will complete in FY 2001 upon completion of both ACDS Block 1 and CEC Baseline 2 TECHEVAL and OPEVALs. Until then the hardware and software corrections will be made by Raytheon Systems Company via a sole source contract, N00024-97-C-5466. The life cycle maintenance and software support agent for ACDS Block 1 is NSWC PHD ECO.

Exhibit R-2, RDT&E Budget Item Justification	Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E,N/BA 5	Program Element (PE) Name and No. CIC Conversion/NTDS Improv. / 0604518N Project K1604/U1604

E. Schedule Profile:

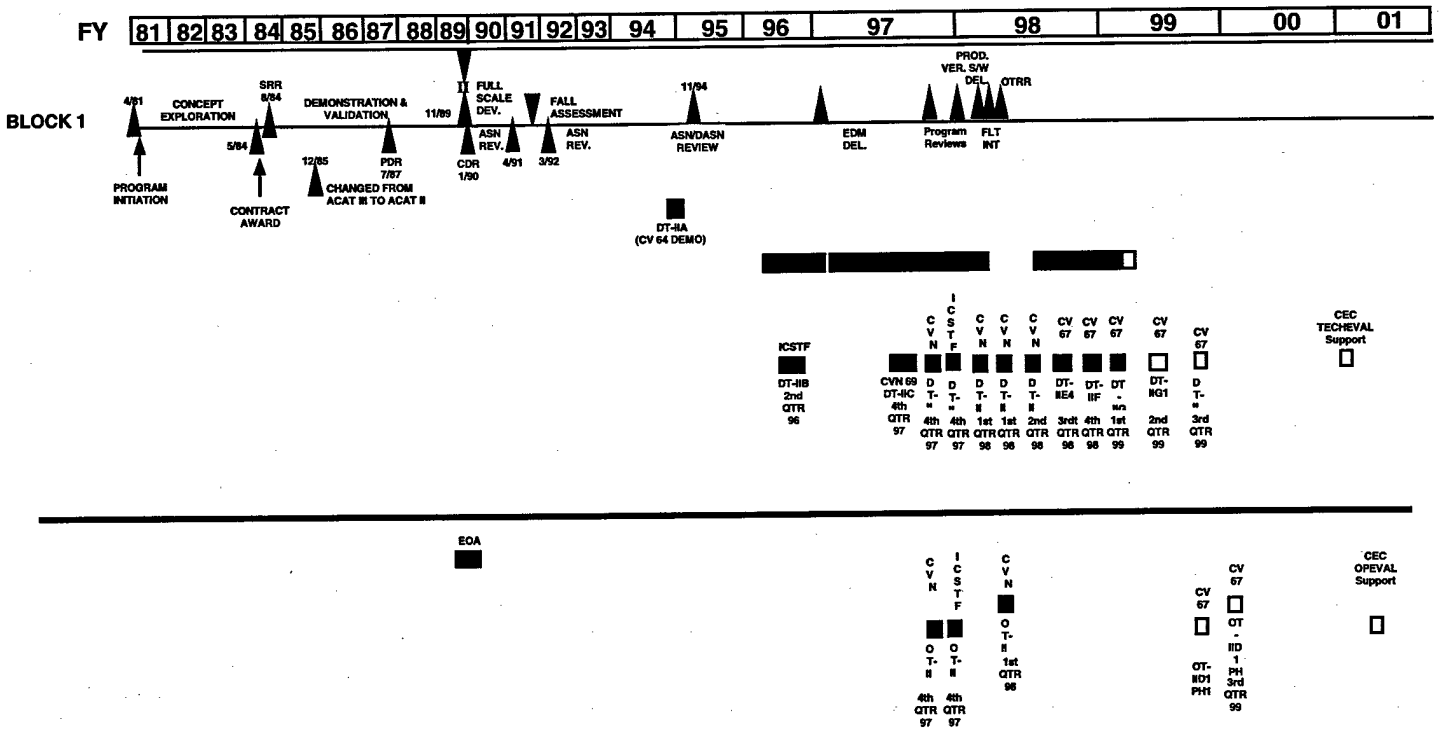


Exhibit R-3 Cost Analysis		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E,N/BA 5	PROGRAM ELEMENT NAME AND NUMBER CIC Conversion/NTDS Improv. / 0604518N	PROJECT NAME AND NUMBER CIC Conversion/NTDS Improv. / U1604/K1604

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date			Cost To Complete	Total Cost	Target Value of Contract
Primary Product Development	C/CPAF	Hughes Aircraft Co.	106.521	0	N/A	0	N/A			0	106.521	106.521
Primary Product Development N00024-94-C-5428	SS/CPFF	Hughes Aircraft Co.	17.806	0	N/A	0	N/A			0	17.806	48.418
Primary Product Development N00024-97-C-5466	SS/CPFF	Raytheon Systems Co.	2.071	2.002	10/98	5.511	10/99			2.105	11.689	12.122
Govt. Engineering and Formal Test	WR	SSC-SD	43.326	0	N/A	0	N/A			0	43.326	N/A
Govt. System Engineering/ILS/Training/Test	WR	NSWC / PHD	1.239	.770	10/98	.750	10/99			.750	3.509	N/A
Miscellaneous/Government	VAR	Various		.075	10/98	.245	10/99			.135	0.455	N/A
Miscellaneous/Contractors	VAR	Various	10.037	.355	10/98	.440	10/99			.250	11.082	N/A
Subtotal Product Development			181.000	3.202		6.946				3.240	194.388	
Award Fees												
Subtotal Product Development												
Remarks: N00024-94-C-5428 was a CPFF/LOE contract that accepted other related funding (i.e. CEC RDT&E,N) in order to integrate with ACDS Block 1 Level 2.0. N00024-97-C-5466 was awarded as a CPAF/CPFF contract, with CLIN 0007 for ACDS Block 1 program specific efforts was a CPFF/LOE CLIN.												
Miscellaneous (Test Facility, Simulation Upgrades, Licenses)	VAR	Various	12.672	.133	N/A	.130	N/A			.50	12.985	N/A
Subtotal Support			12.672	.133		.130				.50	12.985	

Exhibit R-3 Cost Analysis		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E,N/BA 5	PROGRAM ELEMENT NAME AND NUMBER CIC Conversion/NTDS Improv. / 0604518N	PROJECT NAME AND NUMBER CIC Conversion/NTDS Improv. / U1604/K1604

Remarks:

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	Fy00 Cost	FY00 Award Date			Cost To Complete	Total Cost	Target Value of Contract
Miscellaneous (DT/OT test, test support and IV&V efforts)	Var	Various	20.842	1.160	11/98	1.050	11/99			.450	23.502	N/A
Subtotal T&E			20.842	1.160		1.050				.450	23.502	
Remarks:												
Resource Management Support N00024-95-C-5433	SS/CPFF	SIR, Inc.	.618	.070	10/98	0	10/99			0	.688	3.944
Subtotal Management			.618	.070		0				0	.688	
Remarks: N00024-95-C-5433 was not awarded specifically for ACDS Block 1, support also includes SSDS MK 1 support efforts.												
Total Cost			215.132	4.565		8.126				3.740	231.563	
Remarks:												

Exhibit R-2, RDT&E Budget Item Justification	Date: February 1999
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/5	R-1 ITEM NOMENCLATURE Submarine Combat System / 0604524N

COST ($ in Millions)	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Total P.E. Cost	17.0	11.4	6.5	3.5	0	0	0	0	0	1807.1
F1941/AN/BSY-2	17.0	11.4	6.5	3.5	0	0	0	0	0	1807.1
Quantity of RDT&E Articles & cost	77/.2		126/2.1	42/1.0						

A. (U) Mission Description and Budget Item Justification: This program provides system engineering support and develops software fixes for deficiencies identified during shipyard and at sea testing of the AN/BSY-2 Submarine Combat System (SCS). It incorporates the software fixes into a scheduled Block 3 upgrade to the U.S.S. Seawolf prior to the conduct of Technical Evaluation (TECHEVAL) and Operational Evaluation (OPEVAL). It also provides for TECHEVAL and OPEVAL planning, asset and equipment procurement and provides direct government engineering support for the conduct of TECHEVAL and OPEVAL. In order to resolve obsolescence and reliability issues, improve acoustic superiority, and maximize Submarine Combat System commonality, it provides funds to move the AN/BSY-2 System into the Integrated Development Plan (IDP) by implementing Acoustics Rapid Cots Insertion (ARCI) Phase II on the Seawolf Class as a Block 4 Upgrade. Block 4 also replaces aging Combat System Display Consoles (CSDC's) and the Enhanced Modular Signal Processors (EMSP's) with COTS based equipment. Funds are also provided to complete AN/BQG-5A development.

(U) Program Accomplishments and Plans:

1. (U) FY 1998 Accomplishments.

- (U) ($13.8) Completed Block 2/2A, continued Block 3 development and initiated the EMSP replacement effort under the Submarine IDP for a Block 4 delivery.
- (U) ($ 1.7) Continued to resolve system discrepancies identified during shipyard testing, at sea testing and during conduct of early TECHEVAL events.
- (U) ($ 1.5) Completed development of AN/BQG-5A Standalone Wide Aperture Array.

2. (U) FY 1999 Plan.

- (U) ($10.0) Complete development, integration and test of Block 3 and continue Block 4 development.
- (U) ($ 1.2) Continue test planning efforts and asset and equipment procurements to support TECHEVAL/OPEVAL.
- (U) ($ .2) Portion of extramural program is reserved for Small Business Innovation Research assessment in accordance with 15 USC 638.

3. (U) FY 2000 Plan.

- (U) ($4.7) Complete conduct of TECHEVAL and OPEVAL (excluding Arctic Operations).
- (U) ($1.8) Initiate resolution of deficiencies found during TECHEVAL/OPEVAL and continue Block 4 development, test and integration.

Exhibit R-2, RDT&E Budget Item Justification	Date: February 1999
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/5	R-1 ITEM NOMENCLATURE Submarine Combat System / 0604524N

B. (U) Program Change Summary

	FY 1998	FY 1999	FY 2000
(U) FY 1999 President's Budget:	17.7	11.7	6.6
(U) Appropriated Value:	17.7	11.7	
(U) Adjustments to FY 1998/1999 Appropriated Value/FY 1999 President's Budget:			
a. FY 98 SBIR Transfer	-0.3		
b. FY 98 BTR	-0.4		
c. Congressional Undistributed Reductions		-0.3	
d. Minor Pricing Adjustments			-0.1
(U) FY 2000/01 PRES Budget Submit:	17.0	11.4	6.5

(U) Change Summary Explanation:

(U) Funding: FY98 adjustments are due to SBIR transfer (-.4), BTR 98-32 Photonics Program shortfall (-.4). FY 99 adjustments are due to Congressional Undistributed Reductions (-.3). FY 00 adjustments are due to minor pricing adjustments (-.1).

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

C. (U) Other Program Funding Summary:

	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Complete	Total Cost
OPN 214700	79.7	144.1	227.0	123.3	129.4	227.5	165.9	168.2	CONT	CONT

(U) Related RDT&E,N:

Exhibit R-2, RDT&E Budget Item Justification	Date: February 1999
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/5	R-1 ITEM NOMENCLATURE Submarine Combat System / 0604524N

(U) PE 0604561N (SSN-21 Development)
(U) PE 0604558N (New SSN Combat System Development)
(U) PE 0604503N (Submarine Sonar Improvements))
(U) PE 0604601N (Mine Development)

D. (U) Acquisition Strategy: The Full Scale Development and Limited Production contract is essentially complete. The follow-on maintenance contract with Lockheed-Martin Corporation, Syracuse is a sole source Cost Plus Award Fee (CPAF) with multiple option years ending in FY 2000. An additional follow-on sole source maintenance contract is planned with Lockheed-Martin Corporation, Syracuse.

Exhibit R-2, RDT&E Budget Item Justification	Date: February 1999
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/5	R-1 ITEM NOMENCLATURE Submarine Combat System / 0604524N

E. (U) Schedule Profile:

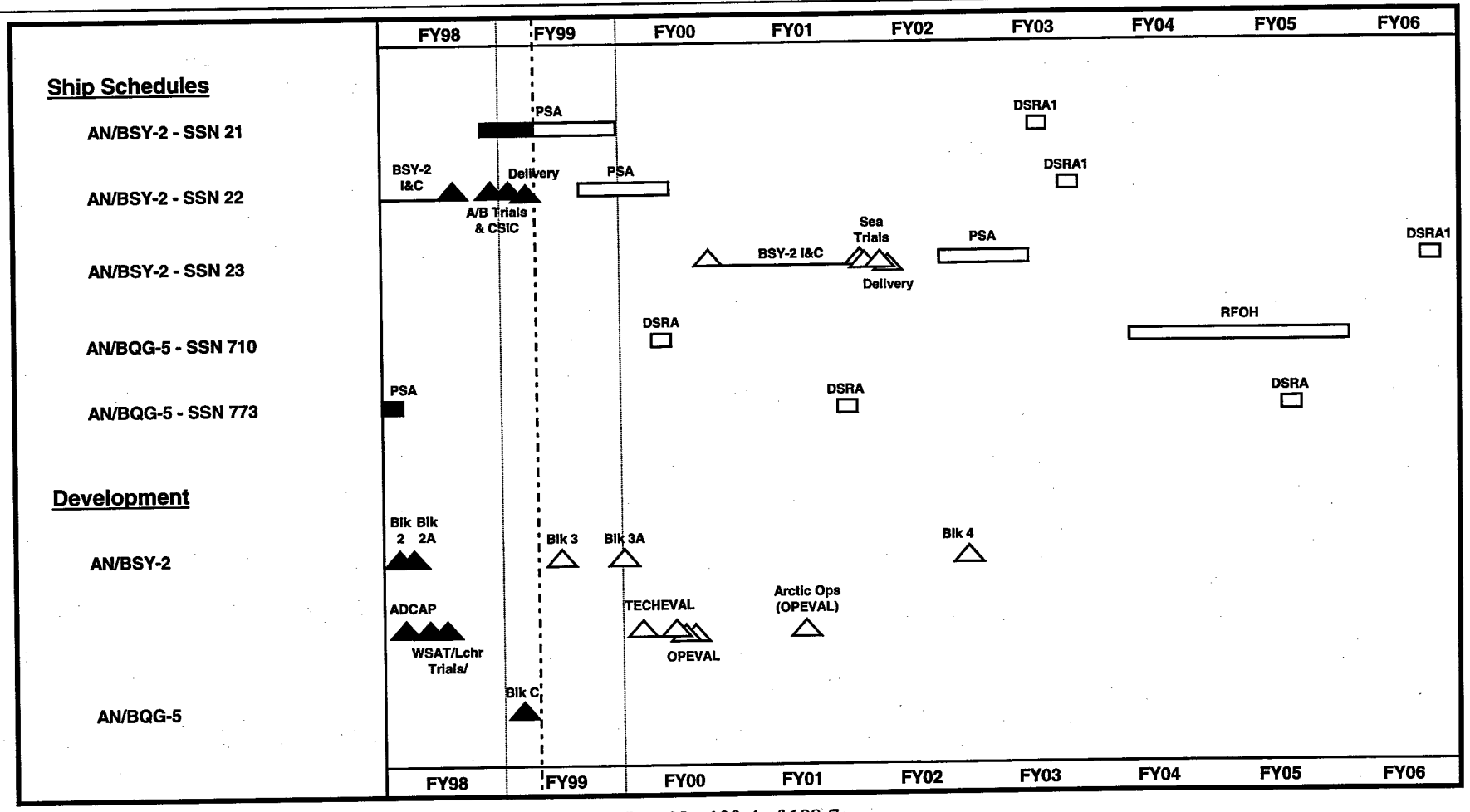


Exhibit R-3 Cost Analysis		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY - RDT&E,N/5	PROGRAM ELEMENT NAME AND NUMBER Submarine Combat System / 0604524N	PROJECT NAME AND NUMBER AN/BSY-2 / F1941

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date	FY01 Cost	FY01 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Primary/Ancillary H/W & S/W Dev, Tooling, Systems Eng, Licenses, Award fees	CPIF	LMC Syracuse, NY	1206.8	0		0				0	1206.8	Complete
Team Trainer Development	CPIF	Raytheon Portsmouth, RI	22.3	0		0				0	22.3	Complete
Primary hardware development	FFP	IBM, Manassas, VA	16.8	0		0				0	16.8	Complete
Government Furnished Equipment, Enhanced Modular Signal Processor	CPIF	AT&T Greensboro, NC	39.9	0		0				0	39.9	Complete
Hardware Engineering	WR	NSWC, Crane, IN	15.6	0		0				0	15.6	Complete
Trainer Development Support	WR	NTSC Orlando, FL	5.3	0		0				0	5.3	Complete
Systems Engineering, H/W & S/W Development	WR	NUWC, Newport, RI	300.2	.8	10/98	.5	10/99			.3	301.8	N/A
Software Development Systems Engineering, Licenses, Award Fees	CPAF	Lockheed-Martin Syracuse, NY	17.4	9.4	11/98	1.3	11/99			.8	28.9	N/A
Government Furnished Property	Various	Various	3.2	0		0				0	3.2	Complete
Miscellaneous	Various	Various	34.8	0		0				0	34.8	Complete
Subtotal Product Development			1662.3	10.2		1.8				1.1	1675.4	

Remarks: Award Fee: LMC, Syracuse CPAF contract: Maximum 10% award fee budgeted.

Period	Rating	Percentage Awarded
10/1/96-3/31/97	Outstanding	100%
4/1/97-9/30/97	Outstanding	100%
10/1/97-3/30/98	Above Average	80%
4/1/98-9/30/98	Outstanding	100%

The Lockheed Martin contract does not have a target value is a Level of Effort CPAF contract.

Exhibit R-3 Cost Analysis		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY - RDT&E,N/5	PROGRAM ELEMENT NAME AND NUMBER Submarine Combat System / 0604524N	PROJECT NAME AND NUMBER AN/BSY-2 / F1941

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date	FY01 Cost	FY01 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Engineering Support	WR/RCP	NUWC Newport, RI	35.2	0		0				0	35.2	Complete
Subtotal Support			35.2	0		0				0	35.2	

Remarks:

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date	FY01 Cost	FY01 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation, Operational Test & Evaluation	WR	NUWC Newport, RI	3.4	1.1	10/98	4.7	10/99			2.4	11.6	N/A
Government Furnished Property	Various	Various	.5	0		0				0	.5	Complete
Subtotal T&E			3.9	1.1		4.7				2.4	12.1	N/A

Remarks: Test articles required in support of TECHEVAL/OPEVAL:

FY98 Description	Qty.	Cost
Range Support		.075
SSXBT/SSXSV	75	.023
ADCAP Torpedo's	2	.054

FY00 Description	Qty.	Cost
Range Support		1.500
SSXBT/SSXSV	100	. 030
ADCAP	18	.486
TOTEMs	8	.100
P-3 Support		.005
TLAM*	1*	3.500*

* Current plan has TLAM launch cost funded by PMA281 as part of Operational Tomahawk Launch (OTL) requirement for FY00, and is not budgeted in this Program Element.

Exhibit R-3 Cost Analysis		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY - RDT&E,N/5	PROGRAM ELEMENT NAME AND NUMBER Submarine Combat System / 0604524N	PROJECT NAME AND NUMBER AN/BSY-2 / F1941

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date	FY01 Cost	FY01 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Management Support Services & Engineering Technical Services	CPAF	EG&G Gaithersburg, MD	76.9	0		0				0	76.9	Complete
Engineering Support	MIPR	Mitre McLean, VA	7.4	.1		0				0	7.5	N/A
Subtotal Management			84.3	.1		0				0	84.4	N/A
Remarks:												
Total Cost			1785.7	11.4		6.5				3.5	1807.1	N/A

Exhibit R-2, RDT&E Budget Item Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E,N/BA-5	R-1 ITEM NOMENCLATURE 0604528N/SWATH Oceanographic Ship	

COST ($ in Millions)	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Total P.E. Cost	45.0									45.0
22457 SWATH Oceanographic Ship	45.0									45.0
Quantity of RDT&E Articles & cost	1 – 45.0									1 – 45.0

A. Mission Description and Budget Item Justification

(U) Mission Description: 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 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 that 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 planned for future development, such as Surface Combatants, mine countermeasure ships and SIGINT surveillance ships. This program is a streamline acquisition program and has minimized 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) Program Accomplishments and Plans:

1. (U) FY 1998 ACCOMPLISHMENTS:

(U) ($1.0) 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) ($40.5) 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) ($3.5) - Program Technical and Management Support

2. (U) FY 1999 PLAN: Not Applicable.

3. (U) FY 2000 PLAN: Not Applicable.

Exhibit R-2, RDT&E Budget Item Justification	Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E,N/BA-5	R-1 ITEM NOMENCLATURE 0604528N/SWATH Oceanographic Ship

B. Program Change Summary:

	FY 1998	FY 1999	FY 2000
FY 1999 President's Budget:	45.0		
Appropriated Value:	45.0		
Adjustment to FY 1998 Appropriated Value/ FY 1999 President's Budget:			
FY 2000 PRES Budget Submit:	45.0		

Funding: Appropriation code 1301 assigned to denote FY1998/2001 RDT&E funding.

Schedule: Not Applicable.

Technical: Not Applicable.

C. Other Program Funding Summary: Not Applicable.

FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Complete	Total Cost

D. Acquisition Strategy: N00024-98-92304 Firm Fixed Price (FFP) Agreement signed with Lockheed Martin for Phase I on 5 May 98 for $1,000,000. Only Phase I tasks are part of the agreement. The planned Phase II tasks will be developed during Phase I and exercised as an option.

E. Schedule Profile:

	FY 1998	FY 1999	FY 2000
Program Milestones	Phase I Trades/Concept Cost Estimate		

FY 1998	FY 1999	FY 2000
Develop Performance		

Exhibit R-2, RDT&E Budget Item Justification			Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E,N/BA-5		R-1 ITEM NOMENCLATURE 0604528N/SWATH Oceanographic Ship	
	Specifications Finalize Requirements Document Major Decision II (MDII) Approval to enter Phase II		
Engineering Milestones	Phase I Contract/Detail Design	Phase II Construction of AGOR SWATH	Continue Phase II Construction of AGOR SWATH
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) Award Phase I	Award Phase II Option	

Exhibit R-3 Cost Analysis		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E,N/BA-5	PROGRAM ELEMENT NAME AND NUMBER 0604528N/SWATH Oceanographic Ship	PROJECT NAME AND NUMBER SWATH Oceanographic Ship/22457

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date			Cost To Complete	Total Cost	Target Value of Contract
Design Development	FFP	Lockheed Martin Sunnyvale, CA	1.0							0	1.0	1.0
AGOR SWATH Construction	FFP	TBD	40.5							0	40.5	40.5
Subtotal Product Development			41.5							0	41.5	41.5
Remarks:												
Development Support Equipment												
Software Development												
Training Development												
Integrated Logistics Support												
Configuration Management												
Technical Data												
GFE												
Subtotal Support												
Remarks:												

Exhibit R-3 Cost Analysis		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E,N/BA-5	PROGRAM ELEMENT NAME AND NUMBER 0604528N/SWATH Oceanographic Ship	PROJECT NAME AND NUMBER SWATH Oceanographic Ship/22457

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date			Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation												
Operational Test & Evaluation												
Tooling												
GFE												
Subtotal T&E												
Remarks:												
Contractor Engineering Support												
Government Engineering Support												
Program Management Support	Misc	Misc	3.5							0	3.5	3.5
Program Management Personnel												
Travel												
Labor (Research Personnel)												
Overhead												
Subtotal Management			3.5							0	3.5	3.5
Remarks:												
Total Cost			45.0							0	45.0	45.0
Remarks:												

Exhibit R-2, RDT&E Budget Item Justification	Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E,N/5	R-1 ITEM NOMENCLATURE New Design SSN Development/0604558N

COST ($ in Millions)	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Total P.E. Cost	299.5	230.3	241.5	204.1	162.0	153.9	149.7	158.0	136.8	2,863.8
F1947/New Design SSN HM&E	198.4	143.1	166.3	134.2	104.0	99.6	103.8	113.1	102.5	1,925.7
F1950/New Design SSN Combat Systems Development	89.8	70.2	75.2	69.9	58.0	54.3	45.9	44.9	34.3	909.8
F2429/Enhanced Sonar Dome Demonstration/Validation	3.8	7.0	0	0	0	0	0	0	0	10.8
F2430/Advanced Submarine Tactical Electronic Sys/Int. Mast	7.5	0	0	0	0	0	0	0	0	7.5
F2644/NSSN Advance Technology Insertion		5.0	0	0	0	0	0	0	0	5.0
F2645/NON-Propulsion Electronics System		5.0	0	0	0	0	0	0	0	5.0
Quantity of RDT&E Articles & cost										

A. (U) Mission Description and Budget Item Justification: The U.S. Navy must maintain a submarine fleet that is of sufficient capability and numbers to defend American interests. The New Attack Submarine (New SSN) is being designed to fulfill this need. It will counter the potential threats of the next century in a multi-mission capable submarine that has the ability to provide covert, sustained combat 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 pursuing cost reduction, producibility improvement, and technical risk management. This Program Element (PE) provides the technology, prototype components, and systems engineering needed to design and construct the New SSN and build and its Command, Control, Communications, and Intelligence (C^3I) 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 submarine bow SONAR dome.

(U) Project F2430: The congressional plus-up for Advance Submarine Tactical Electronic Combat System (ASTECS) and Integrated Electronic Support Measures (ESM) Mast (IEM) restored several highly desirable elements of the ASTECS/IEM programs to improve platform performance. These items were eliminated due to changing priorities. Improvements included enhancements to ship's radar intercept, emitter identification, and signal intercept capabilities.

(U) Project F2644: The Congressional Plus-Up provided additional funding to insert new technologies on the New SSN. With these funds, three technology insertions were initiated for New SSN specific development: High Frequency Remote Ahead Profiling; Total Ship Monitoring System (TSMS) Improvements; and Advanced Sail.

Exhibit R-2, RDT&E Budget Item Justification	Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E,N/5	R-1 ITEM NOMENCLATURE New Design SSN Development/0604558N

(U) Project F2645: The congressional plus-up is for New SSN Non-Propulsion Electronics System (NPES) inter-system engineering and integration efforts.

B. (U) Program Change Summary

	FY 1998	FY 1999	FY 2000
FY 1999 President's Budget:	307.7	218.8	206.0
Appropriated Value:	323.1	235.8	0
Adjustments to FY 1998/1999 Appropriated Value/ FY 1999 President's Budget: Undistributed Reductions/Adjustments	-23.6	-5.5	+35.5
FY 2000 PRES Budget Submit:	299.5	230.3	241.5

(U) Change Summary Explanation:

(U) F1947 Funding: The FY 1998 decrease of $16.9M is attributed to Undistributed Adjustments (-$6.8M) and othe minor reprogramming (-$10.1M). The FY 1999 decrease of $3.2M is attributed to a decrease to undistributed adjustments (-$0.4M) and Contract Advisory and Assistance Services (-$2.8M). The FY2000 increase of $27.8M is attributed to increases of $30.0M for New Attack Submarine (New SSN) and several minor program decreases (-$2.2M).
(U) F1950 Funding: The FY 1998 decrease of $6.0M is attributable to Undistributed Reductions (-$2.9M), Contract Advisory and Assistant Services (-$0.9M), SBIR ($-2.2M). The FY1999 decrease of $2.2M is attributed to a decrease to undistributed adjustments (-$0.2M) and Contract Advisory and Assistance Services (-$2.0M). The FY2000 increase of $7.7M is attributed to New SSN C^3I Combat System Development (+$3.3) NWCF Rate Adjustments (+0.1M), New SSN C3I shortfall, undistributed adjustments (+$5.1), undistributed adjustments (+$0.1M) and Outsourcing reduction (-$0.1M), Non-Pay inflation reduction (-$0.8M).
(U) F2429 Funding: The FY1998 decrease of $0.2M is attributable Undistributed Reductions (-$0.1M) and SBIR (-$0.1M) FY1999 Congressional add of $5.0M and explanation below for reductions.
(U) F2430 Funding: The FY 1998 decrease of $0.5M is attributable to Undistributed Reductions (-$0.3M) and SBIR (-$0.2M).
(U) F2644 Funding: FY1999 Congressional add of $5.0M and explanation below for reductions.
(U) F2645 Funding: FY1999 Congressional add of $5.0M and explanation below for reductions
Combination reduction of (-$0.1M) in FY1999 for undistributed reductions under projects F2429, F2430, F2644 and F2645.
(U) Schedule: Not applicable.
(U) Technical: Not applicable.

Exhibit R-2a, RDT&E Project Justification			Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E,N/5	Program Element Name & No. New Design SSN Development/0604558N	Project Name and Number New Design SSN HM&E/F1947	

Cost ($ in Millions)	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
F1947/New Design SSN HM&E	198.4	143.1	166.3	134.2	104.0	99.6	103.8	113.1	102.5	1925.7
RDT&E Articles Qty										

A. (U) Mission Description and Budget Item Justification: (U) This project encompasses all the Hull, Mechanical and Electrical (HM&E) development efforts for the New Attack Submarine (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 process maintains the focus of multi-discipline teams consisting of Navy, shipbuilder and suppliers. 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, 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 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 supported a FY 1998 lead ship construction contract award.

(U) Program Accomplishment and Plans:

1. (U) FY 1998 Accomplishments:

- (U) ($176.6M) Continued design, manufacturing, and qualification testing of prototype systems and components such as: ship service turbine generator (SSTG); weapons stowage, handling and launch systems; main thrust bearing; electromagnetic signature reduction; emergency diesel generator; non-Chlorofluorocarbon (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. Completed testing of next generation design configuration scaled prototype propulsor on large scale vehicle and initiated design and manufacture of full scale propulsor. Continued 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. Provided IPPD (Design/Build) team support at shipyards, Navy laboratories and in-house. Supported ship design and construction efforts with engineering evaluations and ship integration assessments for emergent ship design and systems development issues.

- (U) ($7.2M) 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 the New SSN construction through use of IPPD's concurrent engineering and design/build philosophy. Continued coordination of New SSN specification. Continued cost estimating and validation of cost reduction concepts for New SSN overall design development. Continued environmental compliance and pollution prevention efforts.

Exhibit R-2a, RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E,N/5	Program Element Name & No. New Design SSN Development/0604558N	Project Name and Number New Design SSN HM&E/F1947

- (U) ($10.6M) 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 Attack Submarine (New SSN) systems, continued development of an onboard team trainer and Hull, Mechanical and Electrical (HM&E) trainers, and continued prototyping digital data environment that supports the Joint Computer-Aided Logistics System (JCALS) concepts.

- (U) ($4.0M) Continued the development of the Test and Evaluation Master Plan (TEMP), Vulnerability Analysis Report (VAR) and Non-Propulsion Test Index (NPTI), provided Integrated Production and Process (IPPD) support to Commander Operational Test and Evaluation Force (COTF) operational assessments. Prepared test plans and schedules associated with developmental testing, shock, acoustic and launchers trials testing, weapons accuracy testing and technical evaluation. Conducted engineering evaluation of test results, Live Fire Test and Evaluation (LFT&E) modeling and analysis. Continued development of the total ship test plan in support of Developmental Test/Operational Test (DT/OT), DT/OT-IIA-IIF.

2. (U) FY 1999 Plan:

- (U) ($119.9M) Continue design, manufacturing, and qualification testing of prototype technologies and components such as: ship service turbine generator (SSTG), weapons stowage, handling and launch systems; propulsor, main thrust bearing; electromagnetic signature reduction; special hull treatments; integrated low pressure electrolyzer system; ship control system; and, reverse osmosis desalination unit. 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. 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. Initiate transitions from advanced Research and Development (R&D) projects and engineering developments of new technologies for potential insertion in the New SSN class.

- (U) ($7.0M) 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) ($9.2M) 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.

- (U) ($4.4M) Continue the development of the TEMP, VAR and NPTI. Plan and coordinate shipbuilder Test and Evaluation efforts. Provide IPPD support to COTF operational assessments. Prepare test plans, schedules and support associated with developmental testing, conduct Command and Control System Module Off-hull Test Series, Shock, Acoustic and Launchers Trials Testing, Weapons Accuracy Testing and Technical Evaluation. Conduct engineering evaluation of test results. Live Fire Test and Evaluation (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-IIF.

Exhibit R-2a, RDT&E Project Justification			Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E,N/5	Program Element Name & No. New Design SSN Development/0604558N	Project Name and Number New Design SSN HM&E/F1947	

- (U) ($2.6M) Portion of Extramural Program is reserved for Small Business Innovation Research Assessment in accordance with 15 USC 638.

3. (U) FY 2000 Plan:

- (U) ($145.705M) Continue design, manufacturing, and qualification testing of prototype technologies and components such as: ship service turbine generator (SSTG), weapons stowage, handling and launch systems; propulsor, main thrust bearing; electromagnetic signature reduction; special hull treatments; and ship control system. 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. Provide Integrated Product and Process Development (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. Continue transitions and engineering developments for new technology insertions into the New Attack Submarine (New SSN) class.

- (U) ($4.895M) Continue effectiveness analyses and evaluations relating to force effectiveness. Conduct analysis in support of force effectiveness assessment and component performance tradeoffs. Maintain cost based approach to New SSN construction through use of IPPD's concurrent engineering 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) ($10.269M) Continue development of: Commercial-off-the–Shelf (COTS) support concepts, Reliability, Maintainability, and Availability (RM&A) modeling analyses, development of trainers and prototyping a digital data environment that supports the Continuous Acquisition Life Cycle Support virtual enterprise concept.

- (U) ($5.474M) Continue the development of the Test and Evaluation Master Plan (TEMP), Vulnerability Analysis Report (VAR) and Non-Propulsion Test Index (NPTI). Plan and coordinate second shipbuilder Test and Evaluation efforts. Provide IPPD support to Commander Operational Test and Evaluation Force (COTF) operational assessments. Prepare test plans, schedules and support associated with developmental testing, conduct Command and Control System Off-hull Test Series, 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 DT/OT-IIA-IIF.

Exhibit R-2a, RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E,N/5	Program Element Name & No. New Design SSN Development/0604558N	Project Name and Number New Design SSN HM&E/F1947

B. (U) Other Program Funding Summary: (Dollars in Millions)

	FY 1998 ACTUAL	FY 1999 EST.	FY 2000 EST.	FY 2001 EST.	FY 2002 EST.	FY 2003 EST.	FY 2004 EST.	FY 2005 EST.	TO COMPLETE	TOTAL PROGRAM
(U) SCN Line 201300 PE: 0204281N	2,510.0	1,995.5	748.5	1,659.3	2,090.3	1,888.4	2,251.6	2,566.8	42,310.5	59,587.0
(U) SCN Line 201310 PE: 0204281N	0	0	0	0	0	0	0	0	0	589.2
(U) O&M,N BA-1 AG/SAG Line Item 1D4D Subhead: HD4D	0	0	0	0	0	0	0	14.6	0	14.6
(U) O&M,N Line BA-3 Subhead: 3B1K	0	0	0	0	2.8	4.7	4.1	3.7	8.3	23.6
(U) OPN Line Item 1320 BA-1 Subhead: 81H5	0	0	0	0	13.2	1.6	0.03	0	0	14.83
(U) OPN Line Item 2762 BA-2 Subhead: 82MB	0	0	0	0	8.4	1.0	0	0	0	13.1
(U) OPN Line Item 5661 BA-4 Subhead: 84TD	0	0	0	0	3.7	0	3.1	0	0	6.8
(U) OPN Line Item 542000 BA-4 Subhead: H4VB	0	0	0	0	0	0	0	12.4	0	12.4
(U) OPN BA-8	0	0	0	0	51.0	52.0	71.0	54.0	0	228.0

(U) Related RDT&E:

(U) PE 0603561N (Advanced Submarine System Development)
(U) PE 0603570N (Advanced Nuclear Power Systems)
(U) PE 0602121N (Surface Ship Technology)

C. (U) Acquisition Strategy: The New Attack Submarine (New SSN) Program has implemented Integrated Product and Process Development (IPPD). The New SSN Program Office has collocated the engineering and program management personnel necessary to plan and pursue total ship system design management and life cycle acquisition responsibilities. The traditional distinct phasing of the design process has been replaced with the continuous concurrent engineering IPPD process. The IPPD approach will also facilitate a smoother transition from design to manufacturing, and reduce the number of changes typically encountered during construction of the Lead and early follow ships. In September 1997, Congress passed a law allowing the two companies to team for production of the first four New Attack Submarines. Under the teaming agreement, Electric Boat remained the design yard for the New SSN and Newport News Shipyard became a part of the IPPD process.

D. (U) Schedule Profile: See attached.

Exhibit R-2a, RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E,N/5	Program Element Name & No. New Design SSN Development/0604558N	Project Name and Number New Design SSN HM&E/F1947

Program Schedule

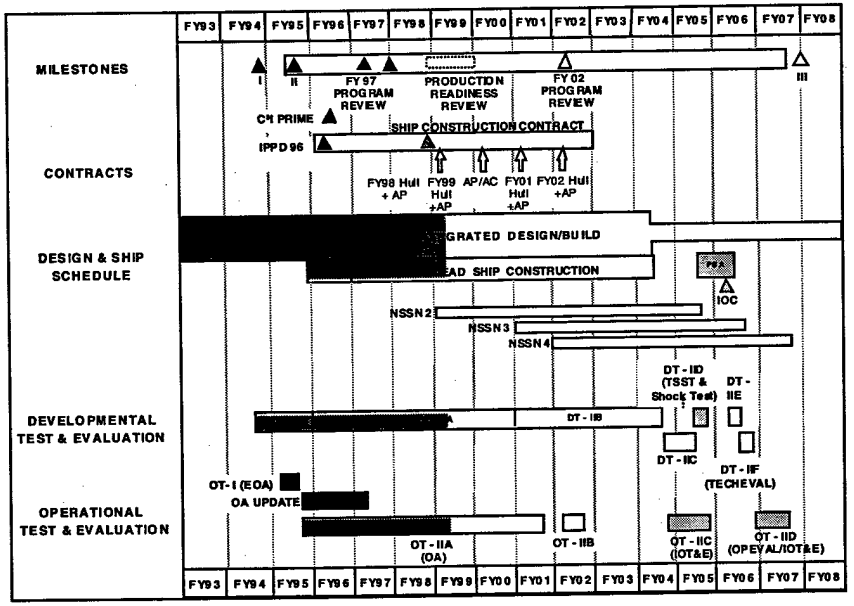


Exhibit R-3 Cost Analysis		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E,N/5	PROGRAM ELEMENT NAME AND NUMBER New Design SSN Development /0604558N	PROJECT NAME AND NUMBER New Design SSN HM&E/F1947

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PyYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date	FY01 Cost	FY01 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Component Development	SS/CPFF	EB-2103 Groton, CT	286.7	48.1	Various	32.6	Various			29.9	397.3	397.3
Main Propulsion Complex Development	SS/CPFF	EB-4030 Groton, CT	153.8	13.0	Various	37.7	Various			19.0	223.5	223.5
Component Development	WR	NSWC- Carderock, MD	246.0	32.1	Nov-98	31.8	Nov-99			143.6	453.5	N/A
Component Development	WR	NAWC Orlando, FL	7.0	6.2	Nov-98	5.4	Nov-99			15.3	33.9	N/A
Component Development	WR	NUWC Newport, RI	54.9	3.9	Nov-98	4.3	Nov-99			11.6	74.7	N/A
Technology Insertion	Various	Miscellaneous	3.0	6.4	Various	16.2	Various			105.0	130.6	N/A
Component Development	Various	Miscellaneous	176.3	21.3	Various	25.6	Various			55.6	278.8	N/A
Subtotal Product Development			927.7	131.0		153.6				380.0	1,592.3	N/A

Remarks:

Support Costs: Not applicable

Remarks:

Exhibit R-3 Cost Analysis		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E,N/5	PROGRAM ELEMENT NAME AND NUMBER New Design SSN Development /0604558N	PROJECT NAME AND NUMBER New Design SSN HM&E/F1947

Cost Categories (Tailor to WBS or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY 99 Award Date	FY00 Cost	FY00 Award Date	FY01 Cost	FY01 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Test & Evaluation	WR	NSWC-Carderock,MD	1.2	0.7	Nov98	1.3	Nov99			135.7	138.9	N/A
Test & Evaluation	WR	NUWC-Newport,RI	3.7	1.6	Nov98	1.7	Nov99			44.4	51.4	N/A
Test & Evaluation	C/CPAF	EG&G-C6411 Rockville,MD	1.1	1.1	Various	1.1	Various			8.5	11.8	11.8
Test & Evaluation	Various	Miscellaneous	5.2	1.0	Various	1.1	Various			25.9	33.2	N/A
Subtotal T&E			11.2	4.4		5.2				214.5	235.3	N/A
Remarks:												
Contractor Support Services	C/CPAF	EG&G-C6411 Rockville, MD	4.0	6.2	Various	6.2	Various			29.9	46.3	46.3
Contractor Support Services – Award Fee	C/CPAF	EG&G-C6411 Rockville, MD	0.5	0.6	Various	0.7	Various			3.2	5.0	5.0
Contractor Support Services	Various	Miscellaneous	15.7	0.9	Various	0.6	Various			29.6	46.8	46.8
Subtotal Management Services			20.2	7.7		7.5				62.7	98.1	98.1
Remarks:												
Total Cost			959.1	143.1		166.3				657.2	1,925.7	N/A

Cost ($ in Millions)	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost

Exhibit R-2a, RDT&E Project Justification			Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E,N/5	Program Element Name & No. New Design SSN Development/0604558N	Project Name and Number New Design SSN Combat System Development/F1950	

F1950/New Design SSN Combat System Development	89.8	70.2	75.2	69.9	58.0	54.3	45.9	44.9	34.3	909.8
RDT&E Articles Qty										

A. (U) Mission Description and Budget Item Justification: (U) This project encompasses the top level systems development, tested integration into the ship of the New SSN C^3I System (formerly referred to as Combat Systems), which includes multiple subsystems. 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, Interior Communications, Tactical Support Devices, Fiber Optic Cable Subsystem, and Special Purpose Subsystems, such as Battle Force Team Trainer and others. New SSN specific development efforts including requirements definition, software, hardware development, software/hardware test, prototype production, and electronic integration as well as physical integration into the platform.

(U) New SSN implementation approach is based on Open System, Commercial-off-the –Shelf (COTS) Non-Developmental Items or subsystems. The program leverages on-going subsystems developments or developing new subsystems where needed to satisfy New SSN requirements. The recurring cost of New SSN C^3I Systems is being reduced to meet the program's affordability goals. Modifications to many subsystems must be developed to: (1) reduce the shipbuilding and construction recurring costs through the use of COTS components; (2) use proven 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 meet the New SSN mission, the following capabilities are provided by the New SSN C^3I 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.

(U) Accomplishments and Plans:

1. (U) FY 1998 Accomplishments:

   - (U) ($11.7M) System level development activities continued in the following areas: Structurally Integrated Enclosure (SIE) electronics integration; interface definition process; development of C^3I 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 Developmental Test/Operational Test (DT/OT) events.

Exhibit R-2a, RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E,N/5	Program Element Name & No. New Design SSN Development/0604558N	Project Name and Number New Design SSN Combat System Development/F1950

- (U) ($69.6M) Continued Sonar, Combat Control, and Architecture (S/CC/A) subsystem development: continued detailed hardware/software development, logistics support, preparation for integration and test and procurement of test hardware and support to non-propulsion electronics intra-subsystem integration. Began inter-subsystem integration.

- (U) ($8.5M) Continued development efforts to support unique requirements for other subsystems. Performed integration testing and problem resolution for the Electronic Support Measures (ESM) and Imaging subsystems at contractor's facility.

2. (U) FY 1999 Plan:

- (U) ($11.0M) System level development activities continue in the following areas: Structurally Integrated Enclosure (SIE) electronic integration; development and validation of C^3I 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; C^3I Subsystem platform integration and external interface integration planning.

- (U) ($53.5M) 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 support to non-propulsion electronics intra-subsystem integration.

- (U) ($4.3M) Continue development efforts to support unique requirements for other subsystems. Deliver ESM and Imaging subsystem Engineering Development Model (EDM) to Technical Direction Agent for integration testing.

- (U) ($1.4M) Portion of Extramural Program is reserved for Small Business Innovation Research assessment in accordance with 15 USC 638.

3. (U) FY 2000 Plan:

- (U) ($16.115M) System level development activities continue in the following areas: SIE electronic integration; development and validation of C^3I 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; C^3I Subsystem platform integration and external interface integration planning. Begin development of Post Shakedown Availability (PSA) deliveries of technology refreshment changes to C^3I System/subsystems.

- (U) ($57.598M) Complete S/CC/A subsystem preliminary product baseline development; complete initial phase of subsystem System Design Certification Testing (SDCT 1). Continue inter-subsystem integration in preparation for November 2000 delivery of the New Attack Submarine (New SSN) preliminary product baseline subsystem. Begin detailed S/CC/A engineering support to shipyard intra- and inter-subsystem integration. Begin development of Post Shakedown Availability (PSA) deliveries of technology refreshment changes to S/CC/A subsystems.

Exhibit R-2a, RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E,N/5	Program Element Name & No. New Design SSN Development/0604558N	Project Name and Number New Design SSN Combat System Development/F1950

- (U) ($1.400M) Complete Electronic Support Measure (ESM) subsystem at sea testing and obtain MSIII production approval. Continue development efforts to support requirements for other subsystems.

B. (U) Other Program Funding Summary: (Dollars in Millions)

	FY 1998 ACTUAL	FY 1999 EST.	FY 2000 EST.	FY 2001 EST.	FY 2002 EST.	FY 2003 EST.	FY 2004 EST.	FY 2005 EST.	TO COMPLETE	TOTAL PROGRAM
(U) SCN Line 201300 PE: 0204281N	2,510.0	1,995.5	748.5	1,659.3	2,090.3	1,888.4	2,251.6	2,566.8	42,310.5	59,587.0
(U) SCN Line 201310 PE: 0204281N	0	0	0	0	0	0	0	0	0	589.2
(U) O&M,N BA-1 AG/SAG Line Item 1D4D Subhead HD4D	0	0	0	0	0	0	0	14.6	0	14.6
(U) O&M,N Line BA-3 Subhead: 3B1K	0	0	0	0	2.8	4.7	4.1	3.7	8.3	23.6
(U) OPN Line Item 1320 BA-1 Subhead: 81H5	0	0	0	0	13.2	1.6	0.03	0	0	14.83
(U) OPN Line Item 2762 BA-2 Subhead: 82MB	0	0	0	0	8.4	1.0	0	0	0	9.4
(U) OPN Line Item 542000 BA-4 Subhead H4VB	0	0	0	0	0	0	0	12.4	0	12.4
(U) OPN Line Item 5661 BA-4 Subhead: 84TD	0	0	0	0	3.7	0	3.1	0	0	6.8
(U) OPN BA-8					51.0	52.0	71.0	54.0	0	228.0

(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 0604574N (Navy Tactical Computer Resources)
(U) PE 0604777N (Navigation/ID Systems)
(U) PE 0101226N (Submarine Acoustic Warfare Development)
(U) PE 0604562N (Submarine Tactical Warfare System)
(U) PE 0604524N (Submarine Combat System)

Exhibit R-2a, RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E,N/5	Program Element Name & No. New Design SSN Development/0604558N	Project Name and Number New Design SSN Combat System Development/F1950

C. (U) Acquisition Strategy: The New Attack Submarine (New SSN) Program has implemented Integrated Product and Process Development (IPPD). The New SSN Program Office has collocated the engineering and program management personnel necessary to plan and pursue total ship system design management and life cycle acquisition responsibilities. The traditional distinct phasing of the design process has been replaced with the continuous concurrent engineering IPPD process. The IPPD approach will also facilitate a smoother transition from design to manufacturing, and reduce the number of changes typically encountered during construction of the lead and early follow ships. In September 1997, Congress passed a law allowing the two companies to team for production of the first four New Attack Submarines. Under the teaming agreement, Electric Boat remained the design yard for the New SSN and Newport News Shipyard became a part of the IPPD process.

D (U) Schedule Profile: See attached.

Exhibit R-2a, RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E,N/5	Program Element Name & No. New Design SSN Development/0604558N	Project Name and Number New Design SSN Combat System Development/F1950

Program Schedule

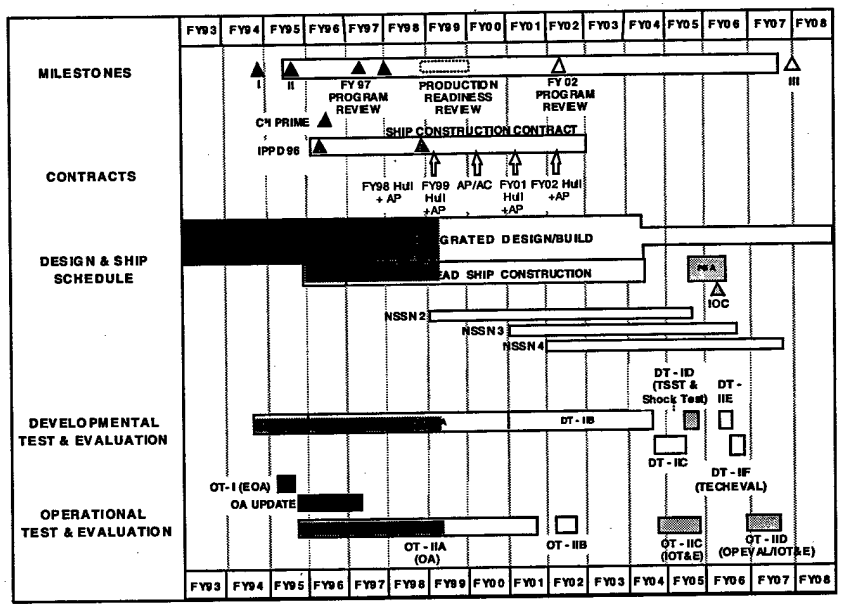


Exhibit R-3 Cost Analysis		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E,N/5	PROGRAM ELEMENT NAME AND NUMBER New Design SSN Development/0604558N	PROJECT NAME AND NUMBER New Design SSN Combat System Development/F1950

C^3I System Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date	FY01 Cost	FY01 Award Date	Cost To Complete	Total Cost	Target Value of Contract
C^3I Prime Contract E&MD Total	C/CPAF	Lockheed Martin, Manassas, VA	111.3	31.4	Various	36.6	Various			38.6	217.9	217.9
C^3I Prime Contract E&MD Award Fee	C/CPAF	Lockheed Martin, Manassas, VA	5.6	1.9	Various	0.9	Various			1.1	9.5	9.5
C^3I Prime Contract Post Delivery	C/FFP	Lockheed Martin, Manassas, VA								44.6	44.6	44.6
Advanced Display System (AN/UYQ-70)	SS/CPFF/ CPIF	Lockheed Martin, St. Paul, MN	18.0	1.1	Jan-99	1.0	Jan-00			5.1	25.2	25.2
Multi-Purpose Processor	SS/CPIF	Digital Sys Resource Fairfax, VA	41.4								41.4	41.4
Multi-Purpose Processor	SS/CPIF	Lockheed Martin, Manassas, VA	1.8								1.8	1.8
Photonics	C/CPIF	Kollmorgen, Northhampton, MA	21.5	0.5	Nov-98						22.0	22.0
Non-Penetrating Periscope	C/CPIF	Kollmorgen, Northhampton, MA	4.1								4.1	4.1
Electronic Support Measures	C/FFP	Lockheed Martin, Syracuse, NY	36.3	0.4	Dec-98						36.7	36.7
Platform Integration	SS/CPFF	Electric Boat Corp., Groton CT	17.8	1.9	Dec-98	1.4	Dec-99			8.2	29.3	29.3
Platform Integration	SS/CPFF	NNews Shipbuilding, Nnews, VA	2.7								2.7	2.7
Integrated Electronic Mast	SS/CPIF	Goleta, Portsmouth, RI	8.9								8.9	8.9
Tactical Simulator	SS/CPFF	Goleta, Portsmouth, RI	2.8								2.8	2.8
High Frequency Sail Array	SS/CPFF	Applied Research, Austin, TX	3.3								3.3	3.3
Navigation/Radar	SS/CPFF	Sperry Corp., Charlottsville, VA	5.1	0.1	Feb-99	0. 1	Feb-00			0.2	5.5	5.5
Technology Refreshment	Various	TBD				0.9				57.2	58.1	N/A
System Engineering	N/A	NSWC, Carderock, MD	2.6	0.5	Nov-98	0.5	Nov-99			3.1	6.7	N/A

Exhibit R-3 Cost Analysis		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E,N/5	PROGRAM ELEMENT NAME AND NUMBER New Design SSN Development/0604558N	PROJECT NAME AND NUMBER New Design SSN Combat System Development/F1950

System Engineering	N/A	NSWC, Crane, IN	2.1	0.3	Nov-98	0.2	Nov-99			1.0	3.6	N/A
Open System Module	SS/CPFF	Unisys Corp./Loral, St. Paul, MN	2.5								2.5	2.5
Technical Direction Agent	N/A	NUWC, Newport, RI	120.6	12.7	Various	12.1	Various			72.1	217.5	N/A
System Engineering	N/A	SSC, Charleston, SC	2.3								2.3	N/A
System Engineering	N/A	SSC, San Diego, CA	1.3	0.2	Nov-98	0.2	Nov-99			0.8	2.5	N/A
System Engineering	N/A	NUWC, Keyport, WA	1.5	0.4	Nov 98	0.4	Nov 99			2.1	4.4	N/A
Miscellaneous	Various	Various	18.3	10.7	Various	14.0	Various			53.5	96.5	N/A
Subtotal Product Development			431.8	62.1		68.3				287.6	849.8	N/A
Remarks:												
Support Costs: Not applicable												
Remarks:												
Test and Evaluation (T&E)	Various	Various	0.8	1.4	Various	0.4	Various				2.6	N/A
Subtotal : Test and Evaluation (T&E)			0.8	1.4		0.4					2.6	N/A

Exhibit R-3 Cost Analysis		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E,N/5	PROGRAM ELEMENT NAME AND NUMBER New Design SSN Development/0604558N	PROJECT NAME AND NUMBER New Design SSN Combat System Development/F1950

Remark

	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	Fy00 Cost	FY00 Award Date	FY01 Cost	FY01 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Contract Support Services/Eng Tech Services	C/CPAF	EG&G, Rockville, MD	4.3	4.6	Various	4.7	Various			9.0	22.6	22.6
CSS/ETS Award Fee	C/CPFF	EG&G, Rockville, MD	0.4	0.4	Various	0.4	Various			0.6	1.8	1.8
Contract Support Services/Eng Tech Services	C/CPFF	EG&G, Rockville, MD	8.9								8.9	8.9
Contract Support Services/Eng Tech Services	C/CPFF	SWL Inc., Vienna, VA	5.7								5.7	5.7
Contract Support Services/Eng Tech Services	C/CPFF	American Systems Corp., Chantilly, VA	2.1								2.1	2.1
Miscellaneous	Various	Various	3.1	1.7	Various	1.4	Various			10.1	16.3	16.3
Subtotal Management Services			24.5	6.7		6.5				19.7	57.4	57.4

Exhibit R-3 Cost Analysis		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E,N/5	PROGRAM ELEMENT NAME AND NUMBER New Design SSN Development/0604558N	PROJECT NAME AND NUMBER New Design SSN Combat System Development/F1950

Remarks:

Total Cost			457.1	70.2		75.2				307.3	909.8	N/A

Exhibit R-2, RDT&E Budget Item Justification	Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E,N/5	R-1 ITEM NOMENCLATURE SSN-21 Development/0604561N

COST ($ in Millions)	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Total P.E. Cost	49.6	21.7	32.0	6.5	12.2	2.8	0.0	0.0	0.0	1669.9
F1946/SSN-21 Development	49.6	21.7	32.0	6.5	12.2	2.8	0.0	0.0	0.0	1669.9
Quantity of RDT&E Articles & cost										

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) Program Accomplishments and Plans:

1. (U) FY 1998 Accomplishments :

- (U) ($20.5) Commenced Post Shakedown Availability (PSA) installation of Advanced Special Hull Treatment (ASHT) on SSN 21.
- (U) ($17.8) Completed analysis of pre-PSA acoustic trial data. Started Operation Test (OT) planning. Continued deficiency assessment and resolution in acoustic silencing including propulsor. Continued planning for Full Ship Shock Test (FSST).
- (U) ($3.8) Continued submarine technology developments and risk management efforts.
- (U) ($7.5) Completed development, certification and final software configuration of Non-Propulsion Electronics (NPE) systems (ship control, Weapons Stowage and Handling System (WSHS), etc.) and weapons launch.

2. (U) FY 1999 Plan:

- (U) ($14.7) Commence post-PSA trials, e.g., acoustic trials, and weapons/sonar certification. Continue OT planning. Re-engineering and design to correct acoustic deficiencies including propulsor. Complete post-PSA analysis of ASHT installation on SSN 21.
- (U) ($3.7) Re-engineering and correction of deficiencies in NPE systems including ship control, WSHS, Exterior Communications Systems (ECS), etc.
- (U) ($3.1) Continue risk management efforts in all high risk areas.
- (U) ($0.2) Portion of extramural program is reserved for Small Business Innovation Research assessment in accordance with 15 USC 638.

Exhibit R-2, RDT&E Budget Item Justification	Date: February 1999
APPROPRIATION/BUDGET ACTIVITY **RDT&E,N/5**	R-1 ITEM NOMENCLATURE SSN-21 Development/0604561N

3. (U) FY 2000 Plan:

- (U) ($21.9) Commence Operational Evaluation (OPEVAL)/Technical Evaluation (TECHEVAL).
- (U) ($4.0) Remove FSST instrumentation and restore the ship to its baseline condition; funds Live Fire Test & Evaluation requirements without performing FSST.
- (U) ($6.1) Re-engineering and correction of deficiencies in NPE systems including ship control, WSHS, ECS, etc. Re-engineering and design to correct acoustic deficiencies including propulsor. Continue risk management efforts in all high risk areas.

B. (U) Program Change Summary:

	FY 1998	FY 1999	FY 2000
(U) FY 1999 President's Budget:	50.3	27.4	69.3
(U) Appropriated Value:	49.5	22.4	0.0
(U) Adjustment to FY 1998/1999 Appropriated Value/ FY 1999 President's Budget:			
a. SBIR	-0.9	0.0	0.0
b. Delay SEAWOLF Shock Testing	+4.0	0.0	0.0
c. SSN21 Mini Performance Trial	-1.2	0.0	0.0
d. Undistributed reductions	-2.0	0.0	0.0
e. Minor adjustments	0.2	0.0	0.2
f. Eliminate FSST	0.0	0.0	-37.1
g. Competitive Outsourcing	0.0	0.0	-0.1
h. Revised Economic Assumption/ Civilian Personnel Underexecution/ FFRDC	0.0	-0.1	0.0
i. Contract Advisory & Assistance	0.0	-0.6	0.0
j. PBD 606 Civilian Pay Rates	0.0	0.0	0.2
k. PBD 604 Non Pay Inflation	0.0	0.0	-0.5
(U) FY 2000/01 PRES Budget Submit:	49.6	21.7	32.0

(U) Change Summary Explanation:

Exhibit R-2, RDT&E Budget Item Justification	Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E,N/5	R-1 ITEM NOMENCLATURE SSN-21 Development/0604561N

(U) Funding: The FY98 net increase of $76K is a result of Small Business Innovation Research Program (-$873K) , BTR 98-22 (-$51K)., Performance, Launcher & Electromagnetic Trials (+$3,999K), SSN21 Mini Performance Trial (-$1,200K), BTR Issue (+$359K), April 1998 Update (-$124K)and Undistributed reduction (-2,034K). The FY99 decrease of (-$52K, -$31K, -$21K and -$617K) is a result of Revised Ecomonic Assumption, Civilian Personnel Underexecution, FFRDC and Contract Advisory & Assistance respectively. The FY00 net decrease of $37,265K is a result of deleting the Full Ship Shock Test ($37,100K); $120K decrease for Competitive Sourcing Savings; $463K decrease for Non Pay Inflation; $248K increase for NWCF Rate Adjustment and a $170K increase for Civilian Pay Rates.

(U) Schedule: No Schedule change.

(U) Technical: $15.5M in FY02 transferred to the New Attack Program.

C. (U) Other Program Funding Summary:

	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Complete	Total Cost
(U) SCN #201200	155.8	23.5	27.7	2.1	13.6	24.4	0.0	0.0	0.0	8,160.8
(U) MILCON P-398	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	27.3
(U) OPN #094900, #051000, #094100	6.3	23.3	47.7	25.1	23.4	17.2	0.2	0.2	0.0	375.2

(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)

D. (U) Acquisition Strategy:

Exhibit R-2, RDT&E Budget Item Justification	Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E,N/5	R-1 ITEM NOMENCLATURE SSN-21 Development/0604561N

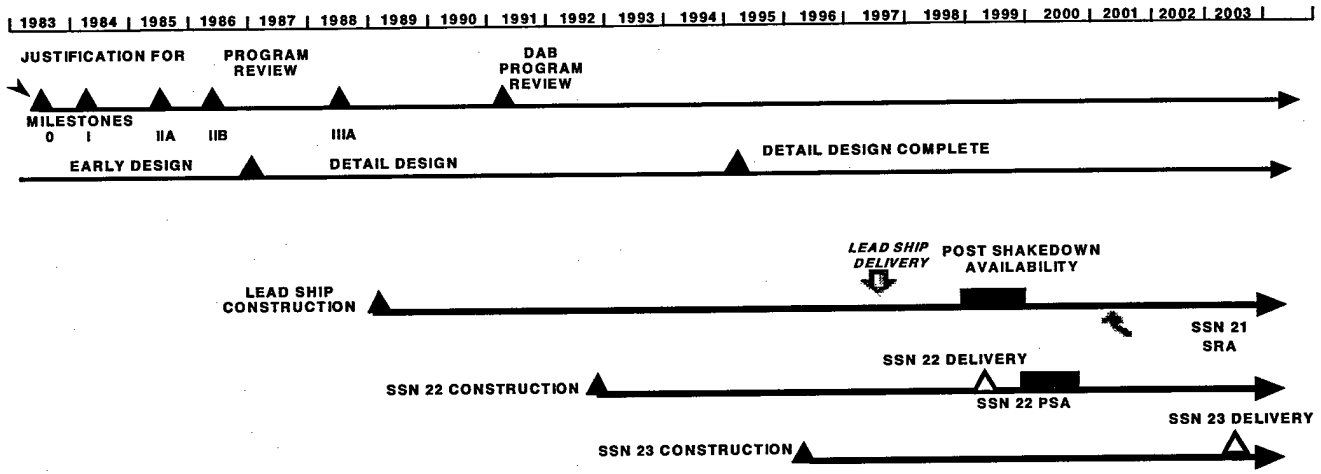
(U) To deliver three SEAWOLF submarines under cost cap
(U) To continue to correct SEAWOLF Acoustics deficiencies.
(U) To work jointly with New SSN when necessary.
(U) Continue to review all areas for possible cost reductions.

E. (U) Schedule Profile:

(U) See attached Planning Schedule Program

Exhibit R-2, RDT&E Budget Item Justification	Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E,N/5	R-1 ITEM NOMENCLATURE SSN-21 Development/0604561N

PLANNING SCHEDULE PROGRAM



SEAWOLF PROGRAM
LAST YEAR IN A FOURTEEN YEAR PROCESS
TOWARD LEAD SHIP DELIVERY

Exhibit R-2, RDT&E Budget Item Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY **RDT&E,N/5**	R-1 ITEM NOMENCLATURE SSN-21 Development/0604561N	

Exhibit R-3 Cost Analysis		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E,N/5	PROGRAM ELEMENT NAME AND NUMBER SSN-21 Development/0604561N	PROJECT NAME AND NUMBER SSN-21 Development/F1946

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total FYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date	FY01 Cost	FY01 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	SS/CPFF	General Dynamics, Groton, CT	355.5	1.9	Various	1.0	Various			2.4	360.8	$360.8
Systems Engineering	SS/CPFF	Newport News Shipbuilding Newport News, VA	116.0	1.4	Various	1.1	Various			0.3	118.8	$118.8
Systems Engineering	WR/RC	NSWC Carderock, MD	311.8	2.5	Various	1.1	Various			0.9	316.3	
Systems Engineering	WR	NUWC Newport, RI	44.3	2.8	Various	1.2	Various			0.9	49.2	
Systems Engineering	Various	Various	465.7	3.2		0.6				2.5	472.0	
Subtotal Product Development			1293.3	11.8		5.0				7.0	1317.1	
Remarks:												
Contractor Engineering Support	Various	Various	19.4	2.0		2.6				0.9	24.9	
Program Management Support	Various	Various	22.5	0.1		1.0				1.0	24.6	
Subtotal Management			41.9	2.1		3.6				1.9	49.5	
Remarks:												

Exhibit R-3 Cost Analysis		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E,N/5	PROGRAM ELEMENT NAME AND NUMBER SSN-21 Development/0604561N	PROJECT NAME AND NUMBER SSN-21 Development/F1946

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total FYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date	FY01 Cost	FY01 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	SS/CPFF	General Dynamics, Groton, CT	68.7	0.0		0.0				0.0	68.7	$68.7
Developmental Test & Evaluation	WR	NSWC Carderock, MD	82.2	5.6	Various	9.5	Various			1.0	98.3	
Developmental Test & Evaluation	Various	Various	108.6	2.2		13.9				11.6	136.3	
Subtotal T&E			259.5	7.8		23.4				12.6	303.3	
Remarks:												
Total Cost			1594.7	21.7		32.0				21.5	1669.9	

Exhibit R-2, RDT&E Budget Item Justification	Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E,N/5	R-1 ITEM NOMENCLATURE Submarine Tactical Warfare System / 0604562N

COST ($ in Millions)	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Total P.E. Cost	39.5	27.8	13.4	11.4	11.4	31.5	22.4	40.8	CONT.	CONT.
F0236/SSN CCS (IMP) (ENG)	39.5	27.8	13.4	11.4	11.4	31.5	22.4	40.8	CONT.	CONT.
Project B Name/No. & subtotal cost										
Project C Name/No. & subtotal cost										
Quantity of RDT&E Articles & cost										

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 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, across 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 additional 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. Improved Submarine Launched Mobile Mine (ISLMM) requires development of a stand-alone mine launching capability. 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.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1998 ACCOMPLISHMENTS:

   (U) ($28.3) Commenced System Design Certification Testing (SDCT) for CCS MK2 Program D0 Block 1C.

   (U) ($11.2) Continued development of AN/BSG-1.

2. (U) FY 1999 PLAN:

   (U) ($18.9) Complete SDCT for CCS MK2 Program D0 Block 1C.

   (U) ($ 8.5) Continue development of AN/BSG-1.

   (U) ($ .4) Portion of extramural program is reserved for Small Business Innovation Research Assessment in accordance with 15 USC 638.

3. (U) FY 2000 PLAN:

Exhibit R-2, RDT&E Budget Item Justification	Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E,N/5	R-1 ITEM NOMENCLATURE Submarine Tactical Warfare System / 0604562N

(U) ($2.8) Conduct Operational Test (OT) for CCS MK2 Program D0 Block 1C and obtain Milestone III.

(U) ($3.2) Commence development of Improved Submarine Launched Mobile Mine (ISLMM) launcher capability.

(U) ($0.9) Develop Tactical Control Program (Tactical Decision Aids) to provide for transition of new technology from 6.4 into submarine CCS.

(U) ($0.2) Develop engineering change to CCS MK 2 Program D0 Block 1C to incorporate ADCAP torpedo Common Broadband Advanced Sonar System (CBASS) capability.

(U) ($6.3) Continue development of AN/BSG-1.

B. ((U) PROGRAM CHANGE SUMMARY:

	FY 1998	FY 1999	FY 2000
FY 1999 President's Budget:	43.1	28.6	18.0
Appropriated Value:	45.7	28.6	
Adjustment to FY 1998/99 .Appropriated Value/FY 1999 President's Budget:			
a. FY98 SBIR Transfer	-1.0		
b. Congressional Undistributed Reductions	-2.6	-.8	
c. Combat Control System Engineering			-11.1
d. Combat System Restructure			-1.6
e. TLAM-N Termination			-1.5
f. ISLMM FCS			+3.2
g. PBD 719R (TLAM-N)			+6.3
h. Combat Systems Upgrade			
i. Minor Adjustments			
FY 2000/01 PRES Budget Submit:	39.5	27.8	13.4

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY98 adjustments are due to SBIR transfer (-1.0), Congressional Undisributed Reductions (-2.6), FY99 adjustments are due to Congressional Undistributed Reductions ((-.8); FY00 adjustments are due to Combat Control System Engineering (-11.1), Zero Sum Combat System Restructuring (-1.6), TLAM-N termination (-1.5), Fund ISLMM FCS RDT&EN effort (+3.2), and continuation TLAM-N (+6.3)

(U) Schedule: Critical Design Review for AN/BSG-1 moved to August 1998, due to implementation of ECP 0001 and dependency on NSSN Hardware.

Exhibit R-2, RDT&E Budget Item Justification	Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E,N/5	R-1 ITEM NOMENCLATURE Submarine Tactical Warfare System / 0604562N

(U) Technical: Not applicable.

C. (U) OTHER PROGRAM FUNDING SUMMARY:

	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Complete	Total Cost
OPN/BA4 54200	18.9	17.4	26.1	23.5	31.0	39.4	49.3	78.2	CONT.	CONT.

(U) Related RDT&E:

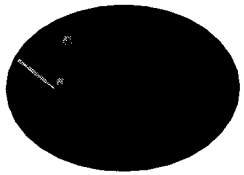
(U) PE 0204229N (Tomahawk & Tomahawk Missile Planning Center)
(U) PE 0205632N (MK 48 ADCAP)
(U) PE 0603504N (Advanced Submarine Combat Systems Dev.)
(U) PE 0604503N (Submarine System Equipment Dev.)
(U) PE 0604707N (Submarine Electronic Warfare Architecture/Eng. Support)

D. (U) ACQUISITION STRATEGY:

- CCS MK2 Block 1C utilizes an open architecture in support of new and upgraded Government and Commercial Off-The-Shelf products and insertion of new weapons capabilities.
- Acquisition Decision Memorandum approved 21 June 1996 granted approval to enter Engineering Manufacturing Development.
- Sole Source Cost Plus Incentive Fee Contract awarded to Raytheon.
- Program Review with Milestone Decision Authority conducted 20 March 1998 demonstrated hardware design maturity. Approval was received to exercise CCS MK2 Block 1C Hardware Production Option for FY98/99/00.

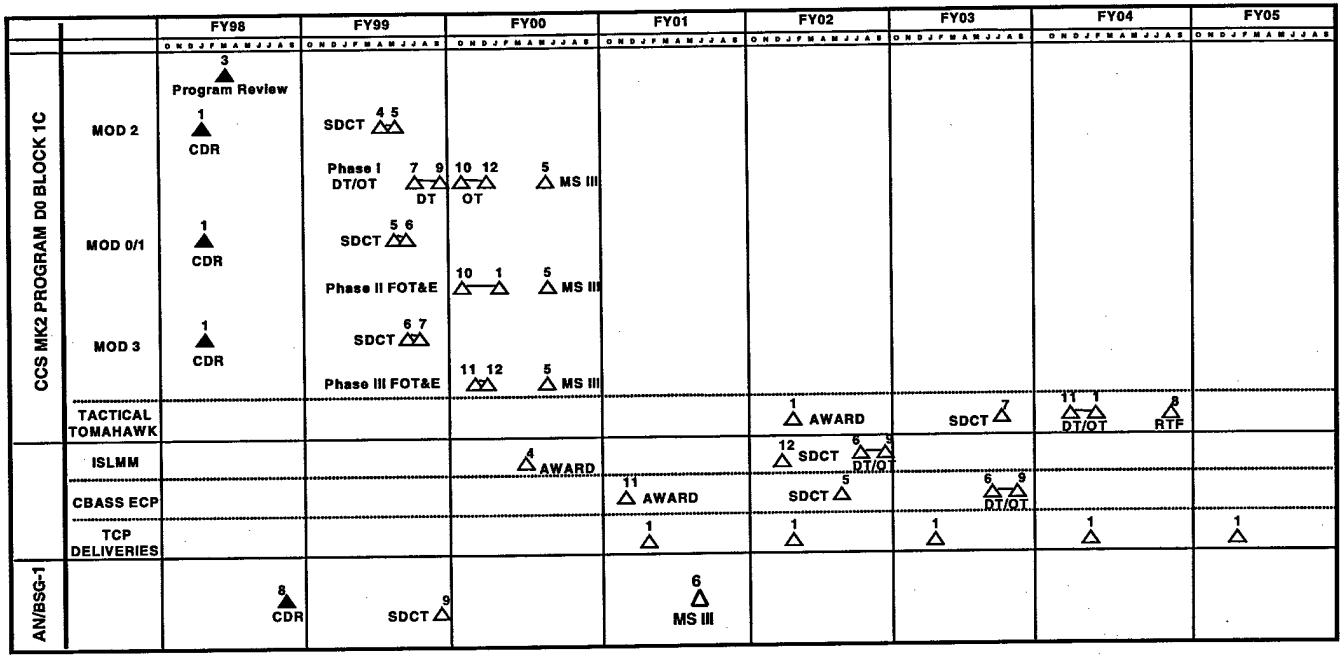
Exhibit R-2, RDT&E Budget Item Justification	Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E,N/5	R-1 ITEM NOMENCLATURE Submarine Tactical Warfare System / 0604562N

E. SCHEDULE PROFILE:



Submarine Combat Systems

Combat Control Development Schedule



LEGEND: △ SCHEDULED COMPLETION ▲ COMPLETED PE: 0604562N Proj: F0236

Exhibit R-3 Cost Analysis		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E,N/5	PROGRAM ELEMENT NAME AND NUMBER Submarine Tactical Warfare System/ 0604562N	PROJECT NAME AND NUMBER SSN Combat Control System Improv (ENG)/F0236

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date	FY01 Cost	FY01 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Hardware Development Block 1C/ CBASS ECP	CPIF	RAYTHEON, Portsmouth, RI	28.6	3.4	*	0				CONT.	CONT.	
Ancillary Hardware Development (AN/BSG-1)	PD	PEO-CMU, Patuxent River, MD	3.4	3.0	*	0				0	6.4	
AN/BSG-1	CPIF	RAYTHEON, Portsmouth, RI	7.4	5.5	*	6.3	*			1..0	12.9	
ISLMM	SBIR	TBD	0	0		1.6	4/00			CONT.	CONT.	
Government Engineering	WR	NUWC NEWPORT, RI	26.5	5.4	10/98	.9	10/99			CONT.	CONT.	
GFE												
Award Fees												
Other												
Subtotal Product Development			65.9	17.3		8.8				CONT.	CONT.	
Remarks: *CONTRACT — Award/Oblig Block 1/C — Jun 96 AN/BSG-1 — Jun 97 ISLMM — Apr 00												
Development Support Equipment												
Software Development	Various	Various	23.3	1.5		2.1				CONT.	CONT.	
Training Development												
Integrated Logistics Support												
Configuration Management												
Technical Data												
GFE												
Subtotal Support			23.3	1.5		2.1				CONT.	CONT.	

Exhibit R-3 Cost Analysis		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E,N/5	PROGRAM ELEMENT NAME AND NUMBER Submarine Tactical Warfare System/ 0604562N	PROJECT NAME AND NUMBER SSN Combat Control System Improv (ENG)/F0236

Remarks:

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date	FY01 Cost	FY01 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	Various	Various	3.1	1.6		0				CONT.	CONT.	
Operational Test & Evaluation	Various	Various	0	5.1		0.2				CONT.	CONT.	
Tooling												
GFE												
Subtotal T&E			3.1	6.7		0.2				CONT.	CONT.	
Remarks:												
Contractor Engineering Support												
Government Engineering Support												
Program Management Support	CPFF	EG&G, Arlington, VA	6.2	2.2	*	0.2	*			CONT.	CONT.	
Travel	PD	NAVSEA, Arlington, VA	0.1	0.1		0.1				CONT.	CONT.	
Subtotal Management			6.3	2.3		0.3				CONT.	CONT.	
Remarks: *CONTRACT AWARD/OBLIG EG&G Sep 94												
Total Cost			98.6	27.8		11.4				CONT.	CONT.	

Exhibit R-2, RDT&E Budget Item Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E /BA 5	R-1 ITEM NOMENCLATURE	Ship Contract Design/Live Fire T&E
	Program Element (PE) Name and No.	PE 0604567N

COST ($ in Millions)	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Total P.E. Cost	35.098	45.263	61.135	69.531	48.320	48.047	36.189	32.428	Continuing	Continuing
Ship Contract Design/S1803	0	2.782	24.992	29.042	20.613	18.663	5.692	0	Continuing	Continuing
LHA Replacement/S2465	0	0	0.008	0.012	0.016	0.021	0.026	0.030	0	41.264
Carrier Contract Design/42301	16.453	38.215	34.866	39.248	26.358	24.649	26.539	28.386	Continuing	Continuing
CVN77 Adv. Technology/S2431	16.496	0	0	0	0	0	0	0	0	16.496
Ship Specifications/S2197	2.149	1.273	1.269	1.229	1.333	3.852	3.932	4.012	Continuing	Continuing
Live Fire Test & Evaluation/S2198	0	0	0	0	0	.862	0	0	Continuing	Continuing
Smart Propulsor Product Model/32646	0	2.993	0	0	0	0	0	0	TBD	TBD
Quantity of RDT&E Articles & cost	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

A. 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. This includes ship specifications (including performance specifications) and contractual documentation associated with acquisition of Navy ships. This line also supports the Congressionally mandated Live Fire Test and Evaluation program 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.

Under Acquisition Reform for new design ships, 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 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, and/or after Milestone II) in those cases where IPTs would be disrupted after Feasibility Study conclusion and/or award of a shipbuilding contract.

Smart Propulsor Product Model (SPPM) will estimate propulsor design, manufacturing and life cycle maintenance costs. The SPPM is to enable innovative hull form – propulsor - appendage alternatives to be considered for future ships with independent estimates (estimates from the propulsor manufacturer) available to the designer/design manager during design.

Exhibit R-2, RDT&E Budget Item Justification			Date: February 1999
APPROPRIATION/BUDGET ACTIVITY	RDT&E /BA 5	R-1 ITEM NOMENCLATURE Program Element (PE) Name and No.	Ship Contract Design/Live Fire T&E PE 0604567N

B. Program Change Summary:

	FY 1998	FY 1999	FY 2000
FY 1999 President's Budget:	89.516	133.645	232.495
Appropriated Value:	92.713	136.717	
Adjustment to FY 1998/99 Appropriated Value/	-57.615	-91.454	
FY 1999 President's Budget:			-171.360
FY 2000 PRES Budget Submit:	35.098	45.263	61.135

Funding: FY98 adjustments due to Congressional undistributed (-$3.472), SBIR reduction (-$2.250), Federal Technology Transfer (-$0.002) , BTR (+$0.776) , DD1002 update(-$0.079) and DD 21 funding transfer to PE 0604300N (-$52.588).
FY 99 adjustments due to DD 21 transfer to PE 0604300N (-$87.541), ADC(X) funding transfer to PE 0603564N (-$5.928), new funding for Smart Propulsor Product Model (+$2.993) and misc adjustments (-$0.978).
FY 00 adjustments due to DD 21 transfer to PE 0604300N(-$130.362),Carrier adjustments (-$36.078), ADC(X) phasing (-$5.000) and misc. (+$0.080).

Schedule: Schedule changes will be identified in the R-2a exhibits.

Technical: Not Applicable.

Exhibit R-2a, RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E /BA 5	Program Element Name & No. Ship Contract Design/Live Fire T&E PE 0604567N	Project Name and Number. Ship Contract Design S1803

Cost ($ in Millions)	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Project Cost	0	2.782	24.992	29.042	20.613	18.663	5.692	0	Continuing	Continuing
RDT&E Articles Qty	0	0	0	0	0	0	0	0	N/A	N/A

A. Mission Description and Budget Item Justification: This project supports development of all technical, programmatic and contractual documentation required after feasibility Studies for the acquisition of various ships in the Navy's Shipbuilding Program. The major effort is the engineering development of the technical and contractual definition of the ship's 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 technical definition from which the shipbuilder develops the shipbuilding detailed design and testing package required to build and test the ship.

FY 1998 ACCOMPLISHMENTS:

- N/A.

FY 1999 PLAN:

- (U) ($ 2.728) Commence CG Modernization Contract Design.
- (U) ($0.054) Portion of extramural program is reserved for Small Business Innovation Research assessment in accordance with 15 USC 638.

.

FY 2000 PLAN:

- (U) ($ 9.287) Continue Planning Yard CG Modernization Contract Design.
- (U) ($ 2.200) Commence CG Government Team support for design products.
- (U) ($ 5.880) Commence T-ADC(X) Industry teams to support Engineering Design efforts.
- (U) ($ 7.000) Commence T-ADC(X) Government/Industry teams, develop RFP and support Source Selection.
- (U) ($0.625) Commence Trimaran Design.

Exhibit R-2a, RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E /BA 5	Program Element Name & No. Ship Contract Design/Live Fire T&E PE 0604567N	Project Name and Number. Ship Contract Design S1803

B. Other Program Funding Summary

	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Complete	Total Cost
PE 0603563N Ship Concept Advanced Design	5.264	7.077	5.318	5.675	6.495	6,595	6.677	6.863	Continuing	Continuing
PE 0603564N Ship Preliminary Design & Feasibility Studies	17.721	8.929	12.012	17.000	33.015	37.359	7.859	0	Continuing	Continuing

C. Acquisition Strategy:

For CG Modernization: The Planning Yard and NAVSEA team will perform required design studies. These studies will lead to the development of detail design/integration products for installation of CG work package to include TBM, Land Attack, AADC and Integrated Ship Controls. The modernization packages will be competed coastwide.

For JCC(X): The plan is to issue an RFP in FY 00 for Contract Design to two teams. Upon completion of Contract Design and evaluation by the Navy, a construction award will be issued in FY 04.

For T-ADC(X): The plan is for a FY 00 SCN ship award. Current plan is to issue RFP in March for general capability evaluation. Award Engineering Design contract to two or three teams in June 1999. Award detail design and construction contract to single team in June 2000 .

D. Schedule:

For CG Modernization: Awards are scheduled for FY 02-FY 06.

For T-ADC(X): Award is scheduled for FY 00/01/02.

For JCC(X) : Award is scheduled for FY04/05.

Exhibit R-3, Project Cost Analysis		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E /BA 5	PROGRAM ELEMENT NAME AND NUMBER Ship Contract Design/Live Fire T&E PE 0604567N	PROJECT NAME AND NUMBER Ship Contract Design S1803

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total Pys Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date			Cost To Complete	Total Cost	Target Value of Contract
Technology Assessments/Integration	WR	NSWC SSES Philadelphia, PA		0.000	N/A	0.120	10/99			Continuing	Cont.	Cont.
		NSWC, CD Carderock,MD		0.000	N/A	2.200	10/99			Continuing	Cont.	Cont.
Industry Team Design Studies	SS /CPAF	Ingalls Shipbuilding Pascagoula, MS	Cont.	2.500	Note 1	9.330	Note 1			Continuing	Cont.	Cont.
	TBD	TBD	Cont.	0.000	N/A	4.000	10/99			Continuing	Cont.	Cont.
Systems Engineering	C/CPFF	JJMA, Arlington, VA	Cont.	0.131	Note 1	5.650	Note 2			Continuing	Cont.	Cont.
	C/CPFF	Gibbs &Cox	Cont.	0.131	Note 1	0.450	Note 2			Continuing	Cont.	Cont.
	TBD	TBD	TBD	0.000	TBD	2.102	TBD			TBD	TBD	TBD
Subtotal Product Development			Cont.	2.762		23.852				Continuing	Cont.	Cont.
Remarks: Note 1. Existing contracts												
Contractor Engineering Support	GSA/FFP	Techmatics Arlington,VA	N/A	0.000	N/A	0.220	N/A			Cont.	Cont.	Cont.
Subtotal Support			Cont.	0.000		0.220				Continuing	Cont.	Cont.
Remarks:												

Cost Categories	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date			Cost To Complete	Total Cost	Target Value of Contract

Exhibit R-3, Project Cost Analysis			Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E /BA 5	PROGRAM ELEMENT NAME AND NUMBER Ship Contract Design/Live Fire T&E PE 0604567N		PROJECT NAME AND NUMBER Ship Contract Design S1803

Subtotal T&E	N/A	N/A	0	0	N/A	0	N/A			0	0	0
Remarks: T&E requirements for the designs are covered by S2198												

Cost Categories	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date			Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	C/CPFF	ROH,Arlington, VA	Cont.	0.000	N/A	0.800	Note 1			Cont.	Cont.	Cont.
Travel	N/A	N/A	N/A	0.020	N/A	0.120	N/A			N/A	N/A	N/A
Subtotal Management			Cont..	0.020		0.920				Cont.	Cont.	Cont.
Remarks:												
Total Cost			Cont.	2.782		24.992				Cont.	Cont.	Cont.
Remarks:												

Exhibit R-2a,RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E /BA 5	PROGRAM ELEMENT NAME AND NUMBER Ship Contract Design/Live Fire T&E PE 0604567N	PROJECT NAME AND NUMBER Ship Specifications S2197

Cost ($ in Millions)	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Project Cost	2.149	1.273	1.269	1.229	1.333	3.852	3.932	4.012	Continuing	Continuing
RDT&E Articles Qty	0	0	0	0	0	0	0	0	N/A	N/A

A. Mission Description and Budget Item Justification: This project funds the 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 (i.e. open systems architecture for information and power systems), manufacturing techniques, environmental requirements, hazardous material reduction, safety and legal/Congressional requirements. Additionally, for FY 1998 only, 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 Performance Specifications/Contract Design to the shipbuilder's detail design and construction.

FY 1998 ACCOMPLISHMENTS:

- (U) ($ 0.899) Continued development of CAD II analysis programs and program integration. Continued development of CAD II ship design systems and modeling techniques for application on DD 21 and T-ADC(X).
- (U) ($0.500) Continued to develop, improve and update NAVSEA cognizant acquisition specifications. Continued development of specification data base and Open Systems architecture.
- (U) ($0.750) Commenced development of Performance Based Ship Acquisition Specification Program

FY 1999 PLAN:

- (U) ($ 0.500) Continue to develop, improve and update NAVSEA cognizant acquisition specifications. Continue development of specification data base and Open Systems architecture.
- (U) ($0.742) Continue development of Performance Based Ship Acquisition Specification Program.
- (U) ($0.031) Portion of extramural program is reserved for Small Business Innovation Research assessment in accordance with 15 USC 638.

Exhibit R-2a,RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E /BA 5	PROGRAM ELEMENT NAME AND NUMBER Ship Contract Design/Live Fire T&E PE 0604567N	PROJECT NAME AND NUMBER Ship Specifications S2197

FY 2000 PLAN:

- ($0.500) Continue to develop, improve and update NAVSEA cognizant acquisition specifications. Continue development of specification data base and Open Systems architecture.
- ($0.769) Continue development of Performance Based Ship Acquisition Specification Program.

B. Other Program Funding Summary

	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Complete	Total Cost
PE 0603563N Ship Concept Advanced Design	5.264	7.077	5.318	5.675	6.495	6,595	6.677	6.863	Continuing	Continuing
PE 0603564N Ship Preliminary Design & Feasibility Studies	17.721	8.929	12.012	17.000	33.015	37.359	7.859	0	Continuing	Continuing

C. Acquisition Strategy: N/A

D. Schedule Profile: N/A

Exhibit R-3, Project Cost Analysis		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E /BA 5	PROGRAM ELEMENT NAME AND NUMBER Ship Contract Design/Live Fire T&E PE 0604567N	PROJECT NAME AND NUMBER Live Fire Test and Evaluation/S2198

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date			Cost To Complete	Total Cost	Target Value of Contract
Specification Improvements	C/CPFF	AME, Arlington, VA	N/A	0.500	Note 1	0.500	Note 1			Continuing	Cont.	N/A
Performance Based Specifications	C/CPFF	JJMA, Arlington, VA	Cont	0.773	Note 1	0.769	Note 1			Continuing	Cont.	N/A
CAD Development	C/CPFF	Misc	Cont.	N/A	N/A	N/A	N/A			0.0	N/A	N/A
Subtotal Product Development			Cont.	1.273		1.269				Continuing	Cont.	N/A

Remarks: Note 1. This is an existing level of effort contract which will be funded by tasks each FY.

Subtotal Support				0		0		0				

Remarks:

Cost Categories	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date			Cost To Complete	Total Cost	Target Value of Contract
Subtotal T&E	N/A	N/A	0	0	N/A	0	N/A			0	0	0

Remarks

Cost Categories	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date			Cost To Complete	Total Cost	Target Value of Contract

Exhibit R-3, Project Cost Analysis		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E /BA 5	PROGRAM ELEMENT NAME AND NUMBER Ship Contract Design/Live Fire T&E PE 0604567N	PROJECT NAME AND NUMBER Live Fire Test and Evaluation/S2198

Subtotal Management	N/A	N/A	Cont.	0	N/A	0	N/A			Continuing	Cont.	Cont.
Remarks:												
Total Cost			Cont.	1.273		1.269				Continuing	Cont.	Cont.
Remarks:												

Exhibit R-2a, RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E /BA 5	PROGRAM ELEMENT NAME AND NUMBER Ship Contract Design/Live Fire T&E PE 0604567N	PROJECT NAME AND NUMBER LHA Replacement/S2465

Cost ($ in Millions)	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Project Cost	0	0	0.008	0.012	0.016	0.021	0.026	0.030	Continuing	Continuing
RDT&E Articles Qty	0	0	0	0	0	0	0	0	N/A	N/A

A. Mission Description and Budget Item Justification: The five ships of the LHA 1 Class are scheduled to reach the end of their 35 year service life starting in 2011. Replacement ships are required to support amphibious operations.

The LHA 1 class is a multi purpose amphibious assault ship delivered to the Navy in the 1970's. The design merged the flight deck of an LPH and a vehicle and well deck of an LPD. The design allowed the use of helicopters and landing craft to conduct amphibious assault , from the ship that carried most of the Marines. As technology has evolved, new amphibious assault systems have been introduced into service (e.g. LCAC) which required the modification of the LHA design, resulting in the LHD 1 Class. New systems being developed require advances in ship capabilities. The MV-22 and the JSF are currently in development and , in order to fully integrate these systems, a ship with greater flight deck capability and improved stability is required. Future programs such as the CH-53E and AH-1W replacement aircraft will further stress current ship designs. As new USMC operational doctrine is developed such as OMFTS and Seabased logistics, the aviation mission requirements will grow.

Funding in line acts as placeholder for full funding which is expected during the budget process, after evaluation of the Development of Options study (expected to be complete by June 1999).

FY 1998: N/A

FY 1999: N/A

FY 2000 PLAN:

- ($ 0.008) Commence LHA Replacement design .

Exhibit R-2a, RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E /BA 5	PROGRAM ELEMENT NAME AND NUMBER Ship Contract Design/Live Fire T&E PE 0604567N	PROJECT NAME AND NUMBER LHA Replacement/S2465

B. Other Program Funding Summary

	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Complete	Total Cost
PE 0603563N Ship Concept Advanced Design	5.264	7.077	5.318	5.675	6.495	6,595	6.677	6.863	Continuing	Continuing
PE 0603564N Ship Preliminary Design & Feasibility Studies	17.721	8.929	12.012	17.000	33.015	37.359	7.859	0	Continuing	Continuing

C. Acquisition Strategy: The acquisition strategy will see a design competition in the early contract design phase (Phase I) with a down select to a single industry team for Phase II. Detail design and construction would be awarded to a single industry team. The new design strategy will depend on the final amount of available funding. In any case, the Navy will conduct an AOA and identify design requirements. Industry teams may then compete for the Phase I Contract Design with a down select for Phase II. The Detail Design and Construction could be awarded to that team or competed.

D. Schedule: The contract award is currently planned for a FY 05 award.

Exhibit R-3 Project Cost Analysis		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E /BA 5	PROGRAM ELEMENT NAME AND NUMBER Ship Contract Design/Live Fire T&E PE 0604567N	PROJECT NAME AND NUMBER LHA Replacement/S2465

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date			Cost To Complete	Total Cost	Target Value of Contract
Government Engineering	WR WR/PO	NSWC-CD Carderock, MD MISC	0 0	0 0	N/A N/A	0.000 0.00	N/A N/A			TBD TBD	TBD TBD	TBD TBD
Contractor Engineering	C	AME,Arlington,VA	0	0	N/A	0.000	N/A			TBD	TBD	TBD
Systems Engineering	TBD	TBD	0	0	N/A	0.000	N/A			TBD	TBD	TBD
Subtotal Product Development			0	0		0						
Remarks: Note 1. Existing contract.												
Subtotal Support			0	0		0						
Remarks:												

Cost Categories	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date			Cost To Complete	Total Cost	Target Value of Contract
Subtotal T&E	N/A	N/A	0	0	N/A	0	N/A			0	0	0
Remarks												

Cost Categories	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date			Cost To Complete	Total Cost	Target Value of Contract
Design Management Support	VAR	TBD	0	0	N/A	0.008	TBD			TBD	TBD	TBD
Subtotal Management	N/A	N/A	0	0	N/A	0.008	N/A			Continuing	Cont.	Cont.
Remarks:												
Total Cost			0	0		0.008				TBD	TBD	
Remarks:												

Exhibit R-2a,RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E /BA 5	PROGRAM ELEMENT NAME AND NUMBER Ship Contract Design/Live Fire T&E PE 0604567N	PROJECT NAME AND NUMBER Carrier Contract Design/42301

Cost ($ in Millions)	FY 1998*	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Project Cost	32.949	38.215	34.866	39.248	26.358	24.649	26.539	28.386	Continuing	Continuing
RDT&E Articles Qty	0	0	0	0	0	0	0	0	N/A	N/A

A. Mission Description and Budget Item Justification: This project encompasses CVN 77 and CVN (X) Contract Design efforts. The traditional distinct phasing of the design process for aircraft carriers has been replaced with a continuous concurrent engineering regime incorporating the methodology, measurement, and management elements of the Navy's Integrated Product and Process Development (IPPD) process, extending it beyond contract award. Combat Systems integration will be design budgeted at contract award to allow further system development. This will ensure that the latest technologies are properly incorporated to accommodate the long design and build schedules typical of aircraft carriers. The IPPD process 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) 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 incorporating best available commercial practices and a phased technical definition.

The CVN 77 research and development investment identifies and validates transition technologies for incorporation into the CVN 77 design. These technologies will enhance shipboard workload reductions, reduce life cycle costs for CVN 77, provide benefits to the other nine ships of the NIMITZ class, and mitigate future risk for CVN (X). The pivotal investment area is transition technology insertion into, and the functional combining of, combat, command & control, communications, aviation, and intelligence systems into a cohesive integrated system. This effort will be herein referred to as Combat Systems Integration.

* Includes S2431

Exhibit R-2a,RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E /BA 5	PROGRAM ELEMENT NAME AND NUMBER Ship Contract Design/Live Fire T&E PE 0604567N	PROJECT NAME AND NUMBER Carrier Contract Design/42301

FY 1998 ACCOMPLISHMENTS: (includes S2431 funding)

- (U) ($11.749) Contract Design – Commenced resolution of design issues and update of the contract package including design drawings, and specifications in areas where near- term LLTM advanced purchase and early fabrication work may be impacted. The update accommodates changes to the ship, its systems and equipment necessitated by equipment obsolescence, operational need, and incorporation of newer systems/technology. Commenced IPPD/IPDE efforts.

- (U) ($ 2.500) Manpower and Material Support –Initiated efforts targeted at reducing both manpower support and ship maintenance costs. Initiatives include Advanced Food Preparation and Service Concepts; Adapting Commercial Ship Practices; Innovative Preservation (Corrosion Control) Systems, and Efficient Inventory and Configuration Management Systems.

- (U) ($ 1.000) Design Tools and Processes - Commenced initiatives to address improvements targeted at reducing the cost of design and changes. Initiatives include the development and improvement of computer design tools in addition to the establishment of an IPDE (Integrated Product Data Environment) which will reduce program cost by improving process time and decision making.

- (U) ($ 3.100) Hull, Mechanical, Electrical & Auxiliaries – Commenced initiatives to address improvements targeted at reducing the acquisition, operational and support costs of the hull, mechanical, electrical and auxiliary systems and equipment. Initiatives include: Waste Stream Management, Use of Electric Auxiliaries in lieu of Steam Driven Auxiliaries, Use of COTS Equipment, Improvements in the Compressed Air and Firemain Systems, and JP-5 Fuel System.

- (U) ($ 1.900) Combat and Intelligence Systems - Commenced initiatives to address improvements targeted at reducing the operational and support costs of the Combat and Intelligence Systems. Initiatives are focused on simplifying the design of the island through the use of multi "function" radars and embedded sensors, and improvements in Ship Navigation, Control, Intelligence and Communication Systems.

Exhibit R-2a,RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E /BA 5	PROGRAM ELEMENT NAME AND NUMBER Ship Contract Design/Live Fire T&E PE 0604567N	PROJECT NAME AND NUMBER Carrier Contract Design/42301

- (U) ($ 2.700) Aircraft Launch, Recovery & Support – Commenced initiatives to address improvements targeted at reducing the acquisition, and operational and support costs of the equipment and systems required to support the ship's aircraft. Initiatives include: Optimized CVN 68 Class Arresting Gear, Catapult Steam, and Accumulator Control System Modernization.

- (U) ($10.000) Propulsion and Electric Power Generation – Commenced evaluation and development of selected propulsion plant systems and components to reduce maintenance costs and manning requirements. Evaluated concepts for partial automation of the electric plant and developed preliminary hardware and software designs of instrumentation and control systems. Evaluated steam valves and actuators and started development of test plans to qualify a re-designed main steam stop (MSS) valve actuator. Evaluated potential changes to the purification system.

FY 1999 PLAN: (Project Number change from S2301 to 42301)

- (U) ($0.818) Portion of extramural program is reserved for Small Business Innovation Research assessment in accordance with 15 USC 638.

- (U) ($12.231) Contract Design – Develop Contract Design package for ship award. Continue refinement of design issues and resolution of pending decisions on technology insertion or process changes with priority on near term advanced procurements and fabrication starts planned in FY00 and FY01. Efforts include further updates to the contract data package including design drawings and specifications. The updates accommodate changes to the ship, its systems, and equipment necessitated by equipment obsolescence, operational needs, and incorporation of newer systems/technologies. Continue IPPD/IPDE efforts. which will increase sortie generation rate. Commence efforts to reconfigure or redesign hangar bays to optimize movement, maintenance and storage of aircraft and associated aviation services. Commence Air Operations simulation efforts in support of topside/island design efforts.
- (U) ($16.166) Combat Systems Integration – Complete Phase I, Requirements Definition, by addressing improvements targeted at reducing operational and support costs of the ship's war fighting systems. Initiatives focus on reducing the number of systems through the use of "multi-function" radars and flat planar antenna arrays, data exchange across operational areas, data fusion, and integrated displays for operators. Complete functional requirement documents for command and control, weapons and sensors, external communications, mission planning, computing architecture, ship interface boundaries, and test and evaluation. Identify and commence trade studies intended to reduce cost without degrading operational performance. Commence Phase II; complete competitive solicitation for Combat Systems Integration concepts and design process. Evaluate proposals and commence competitive Combat Systems Integration design development.

Exhibit R-2a,RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E /BA 5	PROGRAM ELEMENT NAME AND NUMBER Ship Contract Design/Live Fire T&E PE 0604567N	PROJECT NAME AND NUMBER Carrier Contract Design/42301

- (U) ($9.000) Propulsion and Electric Power Generation – Evaluate the consolidated throttle control concept and design the remote electric plant control panel (EPCP). Test preliminary models of a pressurizer control system and begin development. Complete testing and qualify the MSS valve actuators. Begin re-design of purification system to reduce maintenance costs.

FY 2000 PLAN:

- (U) ($13.200) Contract Design – This effort completes remaining required updates to the contract package necessary to support advanced procurement/advanced construction, and continues the contract design effort to support full construction. The update accommodates changes to the ship, its systems, and equipment necessitated by equipment obsolescence, operational need, and incorporation of newer systems/technology. Continue IPPD/IPDE efforts.

- (U) ($11.666) Combat Systems Integration – Complete Phase II competitive solicitation for Combat Systems Integration concepts and design process. Continue monitoring improvements targeted at reducing the operational and support costs of the ship's war fighting systems. Initiatives remain focused on reducing the number of systems through the use of "multi-function" radars and flat planar antenna arrays, data exchange across operational areas, data fusion, and integrated displays for operators. Complete trade studies, including those that result in cost reductions without degrading operational performance into the design development. Evaluate and complete competitive Combat Systems Integration design development and integrate into the ship contract data package. Commence Phase III Design Refinement. Refine Combat Systems Integration design and integrate into the ship design.

- (U) ($10.000) Propulsion and Electric Power Generation – Develop validation models for consolidated throttle control and remote EPCP and begin testing. Continue development of the pressurizer control system. Complete development of a re-designed purification system and begin testing. Begin development of updated detectors and valve control system to accommodate generic instrumentation.

B. Other Program Funding Summary

	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Complete	Total Cost
PE 0603563NShip Concept Advanced Design	5.264	7.077	5.318	5.675	6.495	6,595	6.677	6.863	Continuing	Continuing

Exhibit R-2a,RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E /BA 5	PROGRAM ELEMENT NAME AND NUMBER Ship Contract Design/Live Fire T&E PE 0604567N	PROJECT NAME AND NUMBER Carrier Contract Design/42301

PE 0603512N/42208 Carrier Systems Development (formerly 22208)									
15.020	19.384	111.694	115.039	130.171	56.814	62.909	57.735	Continuing	Continuing
PE 0603512N/S2693 Carrier Systems Definition (formerly PE 0603564N/42208)									
31.124	35.159	24.665	14.546	13.278	0	0	0	Continuing	Continuing
PE 0603512N/42678 Carrier Technology Insertion									
	49.885	0	0	0	0	0	0	0	49.885
BLI 200100 Carrier Replacement Program									
48.737	123.665	751.540	3,950.576	147.615	434.183	1,337.250	131.533	Continuing	Continuing

C. Acquisition Strategy: The Carrier acquisition strategy is that CVN 77 and follow-on hulls will be acquired/managed using a phased technology insertion or "evolutionary" strategy. Technologies will include island redesign (topside) with multi function and volume search radars, as well as other technologies which will reduce total ownership costs on CVN 77 and the previous nine ships of the NIMITZ class, while mitigating risk for CVNX. As with past NIMITZ class carriers, the CVN 77 will be awarded as a sole source FPIF contract to Newport News Shipbuilding

D. Schedule:
Program Milestones CVN 68 Class has been approved at Milestone III

Exhibit R-2a,RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E /BA 5	PROGRAM ELEMENT NAME AND NUMBER Ship Contract Design/Live Fire T&E PE 0604567N	PROJECT NAME AND NUMBER Carrier Contract Design/42301

Engineering Milestones	CVN 68 Class has been approved at Milestone III
T&E Milestones	CVN 68 Class has been approved at Milestone III
Contract Milestones	CVN 68 Class has been approved at Milestone III

Exhibit R-3, Project Cost Analysis		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E /BA 5	PROGRAM ELEMENT NAME AND NUMBER Ship Contract Design/Live Fire T&E PE 0604567N	PROJECT NAME AND NUMBER Carrier Contract Design/42301

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date			Cost To Complete	Total Cost	Target Value of Contract
Product Development	PR, SS, CPAF (existing)	NEWPORT NEWS SHIPBUILDING NEWPORT NEWS, VA	8.800	8.753	1/99	11.125	11/99			Cont.	Cont.	Cont.
	SS,CPFF	BETTIS ATOMIC POWER LAB PITTSBURG, PA	10.000	9.000	11/98	10.000	11/99			14.000	43.000	43.000
	WR	NAWC LAKEHURST. NJ	2.072	2.392	1/99	2.110	11/99			Cont.	Cont.	Cont.
	WR	NSWC DAHLGREN, VA	1.238	3.287	1/99	2.760	11/99			Cont.	Cont.	Cont.
	WR	NSWC CARDEROCK MD	.536	2.065	11/98	1.370	11/99			Cont.	Cont.	Cont.
	PD	SPAWAR SAN DIEGO CA	0.00	2.056	1/99	2.138	1/00			Cont.	Cont.	Cont.
	GSA	AME ARLINGTON VA	1.799	1.890	1/99	1.218	1/00			Cont.	Cont.	Cont.
	Various	MISC (under $1M)	8.504	8.772	11/98 - 2/99	4.145	11/99-2/00			Cont.	Cont.	Cont.
Subtotal Product Development			32.949	38.215		34.866						
Subtotal Support	N/A											
Subtotal Test and Evaluation	N/A											
Subtotal Management	N/A											

Exhibit R-3, Project Cost Analysis		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E /BA 5	PROGRAM ELEMENT NAME AND NUMBER Ship Contract Design/Live Fire T&E PE 0604567N	PROJECT NAME AND NUMBER Carrier Contract Design/42301

Government Furnished Property	N/A											
Total			32.949	38.215		34.866				Cont.	Cont.	Cont.

Exhibit R-2, RDT&E Budget Item Justification	Date: FEBRUARY 1999
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/B. A. 5	R-1 ITEM NOMENCLATURE Program Element (PE) Name and No.: Navy Tactical Computer Resources 0604574N

COST ($ in Millions)	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Total P.E. Cost	31.582	28.059	3.300	3.454	4.148	4.170	4.338	4.586	CONT.	CONT.
STANDARD HARDWARE/21353	29.945	1.964	2.297	2.424	3.074	2.947	3.084	3.154	CONT.	CONT.
UYQ-70 DISPLAY IMPROVEMENTS/22647	0	14.965	0	0	0	0	0	0	14.965	14.965
COMPUTER AIDED DEAD RECKONING TRACER/22648	0	4.989	0	0	0	0	0	0	4.989	4.989
AN/AYK-14/W0845*	1.101	4.971	0	0	0	0	0	0	0	28.372
NWTDB/X2265	.536	1.170	1.003	1.030	1.074	1.223	1.254	1.432	CONT.	CONT.
Quantity of RDT&E Articles & cost	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
*Project Unit W0845 is combined with P.E. 0604215N, Project Unit W0572 beginning FY-00										

A. Mission Description and Budget Item Justification: The Standard Hardware project in combination with UYQ-70 Display Improvements will perform the system engineering necessary to verify Commercial-off-the-Shelf/Open System Architecture (COTS/OSA) technologies and products as suitable for introduction into the AN/UYQ-70(V) Advanced Display System product line. The Computer Aided Dead Reckoning Tracer (CADRT) will automate the management plotting team and information distribution function currently performed manually, allowing automatic evaluation and processing of input data to generate real-time, multi-source integrated tactical data which is used to create a tactical picture to support the decision process. qThe Naval Warfare Tactical Data Base (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.

B. Program Change Summary:

	FY 1998	FY 1999	FY 2000
FY 1999 President's Budget:	33.862	8.249	13.441
Appropriated Value:	35.294	28.249	
Adjustment to FY 1998/1999 Appropriated Value/ FY 1999 President's Budget:	-3.712	-.190	-10.141
FY 2000/01 PRES Budget Submit:	31.582	28.059	3.300

Funding: FY-98 funding adjustments due to SBIR reduction (-$0.933), Contract Advisory and Assistance Services (-$0.085), BTR Update/Issue (-$1.630), DD1002 (-$0.015), Economic Assumptions (-$0.078), General Reductions (-$0.971).
FY-99 funding adjustments due to Contract Advisory and Assistance Services (-$0.117), Economic Assumptions (-$0.066), Civilian personnel underexecution (-$0.007)
FY-00 funding adjustments due to C2 Systems Program Offsets for IT-21 (-$0.064), Zero Sum- Advanced MSN Computer f unctional transfer (-$9.803),

Exhibit R-2, RDT&E Budget Item Justification	Date: FEBRUARY 1999
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/B. A. 5	R-1 ITEM NOMENCLATURE Program Element (PE) Name and No.: Navy Tactical Computer Resources 0604574N

IT-21 shortfall adjustment (-$0.250), Outsourcing Adjustment (-$0.004), NWCF Rates (-$0.016), Undistributed Reductions (-$0.004).

Schedule: N/A

Technical: N/A

Exhibit R-2a, RDT&E Project Justification			Date: FEBRUARY 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E,N/B. A. 5	Program Element Name & No. Navy Tactical Computer Resources 0604574N	Project Name and Number. Standard Hardware 21353	

Cost ($ in Millions)	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Project Cost	29.945	1.964	2.297	2.424	3.074	2.947	3.084	3.154	CONT.	CONT.
RDT&E Articles Qty	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	

A. Mission Description and Budget Item Justification: Perform the system engineering necessary to verify Commercial-off-the-Shelf/Open System Architecture (COTS/OSA) technologies and products as suitable for introduction into the AN/UYQ-70(V) Advanced Display System product line.

FY 1998 ACCOMPLISHMENTS:

- (U) ($0.261) Continued expansion of Computer Open Systems Implementation Program Computer Resources Information Base to increase viability of COTS/OSA technology into tactical systems via additional testing of commercial products.
- (U) ($0.705) Continued investigating technology infusion into the AN/UYQ-70(V) to embrace a wider range of Navy surface applications using new COTS/OSA technology.
- (U) ($0.215) Continued efforts to develop shipboard racks/enclosures and common tactical data systems.
- (U) ($16.504) Adapted AN/UYQ-70(V) for submarine applications.
- (U) ($5.658) Initiated Virtual Prototyping of legacy systems.
- (U) ($6.602) Adapted AN/UYQ-70(V) for Marine Corps applications.

FY 1999 PLANS:

- (U) ($0.950) Perform intensive study and testing of COTS/OSA technology that adheres to standards.
- (U) ($0.500) Adapt these technologies and products to the Navy's tactical display/processor needs in the future.
- (U) ($0.500) Meet Navy emerging surface, subsurface and airborne tactical display/processor requirements of the future.
- U) ($0.014) Portion of extramural program is reserved for Small Business Innovation Research assessment in accordance with 15 USC 638.

FY 2000 PLANS:

- (U) ($1.000) Perform intensive study and testing of COTS/OSA technology that adheres to standards.
- (U) ($0.597) Adapt these technologies and products to the Navy's tactical display/processor needs in the future.
- (U) ($0.700) Meet Navy emerging surface, subsurface and airborne tactical display/processor requirements of the future.

Exhibit R-2a, RDT&E Project Justification		Date: FEBRUARY 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E,N/B. A. 5	Program Element Name & No. Navy Tactical Computer Resources 0604574N	Project Name and Number. Standard Hardware 21353

B. Other Program Funding Summary: N/A

- (U) Related RDT&E
- PE 0603270N (ELECTRONIC WARFARE ADVANCED TECHNOLOGY)
- PE 0603382N (ADV COMBAT SYSTEM TECHNOLOGY)
- PE 0603502N (SHALLOW WATER MCM)
- PE 0603755N (COOPERATIVE ENGAGEMENT)
- PE 0604307N (AEGIS WEAPON SYSTEM MODS)
- PE 0604366N (STANDARD MISSILE IMPROVEMENTS)
- PE 0604372N (NEW THREAT UPGRADE)
- PE 0604755N (SHIP SELF DEFENSE)

C. Acquisition Strategy: N/A

D. Schedule Profile: N/A

Exhibit R-3 Cost Analysis		Date: FEBRUARY 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E,N/B.A. 5	PROGRAM ELEMENT NAME AND NUMBER Navy Tactical Computer Resources 0604574N	PROJECT NAME AND NUMBER Standard Hardware 21353

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date			Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	VARIOUS	VARIOUS	179.600	0		0				0	179.600	179.600
Ancillary Hardware Development												
Systems Engineering	VARIOUS	VARIOUS	14.000	1.177		1.500				CONT.	CONT.	CONT.
Licenses												
Tooling												
GFE												
Award Fees												
Subtotal Product Development			193.600	1.177		1.500				CONT.	CONT.	CONT.
Remarks:												
Development Support Equipment												
Software Development	VARIOUS	VARIOUS	32.373	0		0				0	32.950	32.950
Training Development												
Integrated Logistics Support												
Configuration Management												
Technical Data												
GFE												
Subtotal Support			32.373	0		0				0	32.950	32.950
Remarks:												

Exhibit R-3 Cost Analysis		Date: FEBRUARY 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E,N/B.A. 5	PROGRAM ELEMENT NAME AND NUMBER Navy Tactical Computer Resources 0604574N	PROJECT NAME AND NUMBER Standard Hardware 21353

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total Pys Cost	FY99 Cost	FY99 Award Date	Fy00 Cost	FY00 Award Date			Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	VARIOUS	VARIOUS	20.600	0.242		0.244				CONT.	CONT.	CONT.
Operational Test & Evaluation	VARIOUS	VARIOUS	15.090	0.170		0.178				CONT.	CONT.	CONT.
Tooling												
GFE												
Subtotal T&E			35.690	0.412		0.422				CONT.	CONT.	CONT.
Remarks:												
Contractor Engineering Support	VARIOUS	VARIOUS	10.700	0.300		0.300				CONT.	CONT.	CONT.
Government Engineering Support	VARIOUS	VARIOUS	25.000	0		0				0	25.000	N/A
Program Management Support												
Program Management Personnel												
Travel			1.477	0.075		0.075				CONT.	CONT.	N/A
Labor (Research Personnel)												
Overhead												
Subtotal Management			37.177	0.375		0.375				CONT.	CONT.	CONT.
Remarks:												
Total Cost			298.840	1.964		2.297				CONT.	CONT.	CONT.
Remarks:												

Exhibit R-2a, RDT&E Project Justification		Date: FEBRUARY 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E,N/B. A. 5	Program Element Name & No. Navy Tactical Computer Resources 0604574N	Project Name and Number. Naval Warfare Tactical Data Base X2265

Cost ($ in Millions)	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Project Cost	0.536	1.170	1.003	1.030	1.074	1.223	1.254	1.432	CONT.	CONT.
RDT&E Articles Qty	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	

A. 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 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 13 Jul 93, "NWTDB Requirements for Tactical Naval Warfare Systems," which implements 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.

FY 1998 ACCOMPLISHMENTS:

- (U) ($0.050) Developed TADIL screens and comparison to database data elements.
- (U) ($0.040) Tested DART 2.0 and finalized build.
- (U) ($0.040) Finalized DART 2.0 User's Guide for system architects, system developers, and data administrators.
- (U) ($0.150) Continued 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) ($0.090) Developed 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) ($0.045) Developed Year 2000 problem identification aids in DART.
- (U) ($0.050) Developed a data requirements to mission measure of performance matrices to support the CIO mission.
- (U) ($0.071) Provided technical support to implement DoD architecture and data standards process, including coordination with NATO GROUP 5.

FY 1999 PLANS:

Exhibit R-2a, RDT&E Project Justification		Date: FEBRUARY 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E,N/B. A. 5	Program Element Name & No. Navy Tactical Computer Resources 0604574N	Project Name and Number. Naval Warfare Tactical Data Base X2265

- (U) ($0.090) Develop final DART 3.0 User's Guide.
- (U) ($0.180) Continue to register Naval tactical systems, coordinating with FIWC/DRWG (emphasis on mission planning databases) and changes to the NWTDB Standards Manual – Version Four.
- (U) ($0.164) Develop DART 3.1 configuration management and metadata warehousing features to support data fusion/pull.
- (U) ($0.041) Expand TADIL screens and comparison to USMTF and database elements.
- (U) ($0.070) Test DART 3.1 and finalize build.
- (U) ($0.090) Develop DART 3.1 User's Guide.
- (U) ($0.170) Collect data and prototype in DART a capability linking systems data requirements to mission traceability to support CIO assessment.
- (U) ($0.100) Develop NWTDB Standards Manual – Version Four as an on-line publication.
- (U) ($0.135) Expand Naval C4I Engineering Data models for combat ID and mission planning.
- (U) ($0.100) Technical support to implement DoD architecture and data standards process, including coordination with NATO GROUP 5.
- (U) ($0.030) Portion of extramural program is reserved for Small Business Innovation Research assessment in accordance with 15 USC 638.

- FY 2000 PLANS:

- (U) ($0.099) Develop DART 3.2 and user guide to include HTML online publishing capability.
- (U) ($0.210) Continue to register Naval tactical systems with emphasis on track data and data link message sets as coordinated with FIWC/DRWG.
- (U) ($0.280) Participate with CRWG to identify and resolve selected data fill/data format issues. Prioritize issues with recommendations to program office on which ones to address.
- (U) ($0.170) Establish procedures for real-time standards management on the Worldwide Web. Publish Version Six online, with ongoing continuing updates.
- (U) ($0.124) Enhance DART with a capability for linking systems data requirements to mission traceability to support CIO assessment.
- (U) ($0.120) Act as liaison to DISA data standardization efforts to promote Navy standards and submit data models/data elements as candidate DoD standards.

B. Other Program Funding Summary: N/A
(U) Related RDT&E: N/A

C. Acquisition Strategy: N/A

Exhibit R-2a, RDT&E Project Justification			Date: FEBRUARY 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E,N/B. A. 5	Program Element Name & No. Navy Tactical Computer Resources 0604574N	Project Name and Number. Naval Warfare Tactical Data Base X2265	

D. Schedule Profile: N/A

Exhibit R-3 Cost Analysis		Date: FEBRUARY 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E,N/B.A. 5	PROGRAM ELEMENT NAME AND NUMBER Navy Tactical Computer Resources 0604574N	PROJECT NAME AND NUMBER Naval Warfare Tactical Data Base X2265

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date			Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development												
Ancillary Hardware Development												
Systems Engineering	BPI	GRCI, Hanahan, SC	0.666	0.465	10/98	0.389	10/99			CONT.	CONT.	CONT.
Licenses												
Tooling												
GFE												
Award Fees												
Subtotal Product Development			0.666	0.465		0.389				CONT.	CONT.	CONT.
Remarks:												
Development Support Equipment												
Software Development	BPA	GRCI, Hanahan, SC	0.995	0.620	10/98	0.532	10/99			CONT.	CONT.	CONT.
Training Development												
Integrated Logistics Support												
Configuration Management												
Technical Data												
GFE												
Subtotal Project Development			0.995	0.620		0.532				CONT.	CONT.	CONT.
Remarks:												

Exhibit R-3 Cost Analysis		Date: FEBRUARY 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E,N/B.A. 5	PROGRAM ELEMENT NAME AND NUMBER Navy Tactical Computer Resources 0604574N	PROJECT NAME AND NUMBER Naval Warfare Tactical Data Base X2265

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	Fy00 Cost	FY00 Award Date			Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation												
Operational Test & Evaluation												
Tooling												
GFE												
Subtotal T&E												
Remarks:												
Contractor Engineering Support												
Government Engineering Support												
Program Management Support	BPA	BAH, San Diego, CA	0.065	0.030	10/98	0.030	10/99			CONT.	CONT.	CONT.
Program Management Support	FFP	PRC, San Diego, CA	0.060	0.030	10/98	0.030	10/99			CONT.	CONT.	CONT.
Travel	N/A	SPAWAR San Diego, CA	0.061	0.025		0.022				CONT.	CONT.	N/A
Labor (Research Personnel)												
Overhead												
Subtotal Management			0.186	0.085		0.082				CONT.	CONT.	CONT.
Remarks:												
Total Cost			1.847	1.170		1.003				CONT.	CONT.	CONT.
Remarks:												

Exhibit R-2, RDT&E Budget Item Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY **RESEARCH, DEVELOPMENT, TEST & EVALUATION, NAVY/BA 5**	R-1 ITEM NOMENCLATURE MINE DEVELOPMENT/0604601N	

COST ($ in Millions)	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Total P.E. Cost	2.294	.015	3.315	5.891	1.962	1.968	1.976	2.006	Continuing	Continuing
Mine Improvement Q0267	2.294	.015	3.315	5.891	1.962	1.968	1.976	2.006	Continuing	Continuing
Quantity of RDT&E Articles & cost	N/A	N/A	N/A	18/2.0	N/A	N/A	N/A	N/A		

- The above controls reflect USN dollars only. Additional program dollars are provided from the Royal Australian Navy (RAN) as well as funding approved under the Nunn Amendment, 10 USC 2350(a) as shown in paragraph C.

A. Mission Description and Budget Item Justification

(U) 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; (1b) Target Detection and Response, which uses target models to develop optimal mine designs, settings, and firing algorithms; (2a) Components/Subsystems, which develops upgrades of mine components to maintain effectiveness against current threat targets using proven state-of-the-art technology including a remote controlled mine capability (RECO); (2b) Advanced Power sources, which develops improved batteries without hazardous heavy metals, and (3) New mines, which designs and develops new mines, including an Improved Submarine-Launched Mobile Mine (ILSMM) and a Littoral Sea Mine (LSM). The Improved Submarine-Launched Mobile Mine is an ACAT III, International Cooperative R &D program with the RAN. The Mission Need Statement (MNS M044-85-93) for an Improved Submarine-Launched Mobile Mine (ISLMM) was approved on 13 December 1993. The MNS shows a Fleet need to have a covert mining capability and to eliminate reliability and obsolescence problems associated with the existing MK 67 SLMM. The ISLMM will be used to sustain and improve the USN covert mining capability by converting existing MK48 Torpedoes into dual warhead mines. It will feature: dual explosive sections (warheads); increased compatibility with SSN-688 class fire control systems; multiple-waypoint turn capability; greater range than the present MK 67 SLMM; and the advanced Target Detection Device (TDD) MK 71.

The ISLMM will be designed for launch from the following platforms:

SSN 688 Class Submarines
Seawolf Class Submarines
New SSN Class Submarines
Collins Class Submarines (RAN)

Exhibit R-2, RDT&E Budget Item Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY **RESEARCH, DEVELOPMENT, TEST & EVALUATION, NAVY/BA 5**	R-1 ITEM NOMENCLATURE MINE DEVELOPMENT/0604601N	

The Littoral Sea Mine (LSM) is designed to replace the MK 56 moored mine which is in process of being removed from service inventory. A Mission Needs Statement for LSM (MNS M054-85-94) was approved in June 1994. The MNS identifies the requirement for a moored, wide-area-coverage mine as a replacement for the MK 56 mine against surface and submerged targets in littoral waters. The LSM will be used to extend the current US Navy mining capability beyond the shallow water regime filled by the Quickstrike family of bottom mines. The LSM will utilize existing hardware and technologies to a great extent in order to provide this capability to the Fleet as soon as possible. It will feature an advanced target detection subsystem (based on the TDD MK 71), an encapsulated mobile homing warhead (based on the MK 46 torpedo), and a remote control subsystem. The LSM is intended to be delivered by air, surface, and submarine platforms.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1998 ACCOMPLISHMENTS:

- (U) ($1.170) Completed the development of the ACV algorithm and publish a final report. Continued the development of the DE/MS algorithm and began initial investigation of an algorithm specifically addressing remote control of mines. Coded firmware cartridge for the fast patrol boat algorithm. Continued to develop and generate actuation and damage operational data for fleet minefield planning for high priority targets.
- (U) ($1.024) Continued the development of a larger lithium cell. Completed preliminary designs of batteries using those cells. Completed development of MK-130 Mine battery using the AA lithium cell. Completed the development of the improved pressure sensor and test set for TDD MK-71.
- (U) ($ .100) Prepared requirements documentation for RECO, ILSMM and LSM.

2. (U) FY 1999 PLAN:

- (U) ($ .015) Program Management

3. (U) FY 2000 PLAN

- (U) ($. 852) Initiate design and development of a remote controlled mine (RECO) capability, including signal reception sensors and confirmation signal transmitters.
- (U) ($1.863) Initiate design, development and upgrade for the MK48-based Improved Submarine Launched Mobile Mine (ISLMM) EMD Demo prototype models, to include: Design and build the TDD interface, an exercise configuration, and control group modifications; and identify noise levels.
  Integrate a commercial off the shelf (COTS) control group computer.
  Redesign and build the speed control valve for fuel efficiency.
  Design and build a separation system for release of forward payload.
  Test and evaluate EMD models.
- (U) ($.100) Initiate Tactical Software Development for ISLMM.

Exhibit R-2, RDT&E Budget Item Justification	Date: February 1999
APPROPRIATION/BUDGET ACTIVITY **RESEARCH, DEVELOPMENT, TEST & EVALUATION, NAVY/BA 5**	R-1 ITEM NOMENCLATURE MINE DEVELOPMENT/0604601N

3. (U) FY 2000 PLAN: (Cont.)
- (U) ($.300) Initiate ISLMM test program
- (U) ($.200) Initiate Integrated Logistics Support tasks for ISLMM related to maintainability, reliability and sustainability.

B. Program Change Summary:

	FY 1998	FY 1999	FY 2000
FY 1999 President's Budget	2.270	.015	.852
Appropriated Value:	2.815	.015	
Adjustment to FY 1998 Appropriated Value/ FY 1999 President's Budget	- 0.521		+2.463
FY 2000 CONG Budget Submit	2.294	.015	3.315

Funding: FY 2000 decrease reflects general reductions ($0.037).

Schedule: See attached.

Exhibit R-2, RDT&E Budget Item Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY **RESEARCH, DEVELOPMENT, TEST & EVALUATION, NAVY/BA 5**	R-1 ITEM NOMENCLATURE MINE DEVELOPMENT/0604601N	

IMPROVED SLMM PROGRAM SCHEDULE

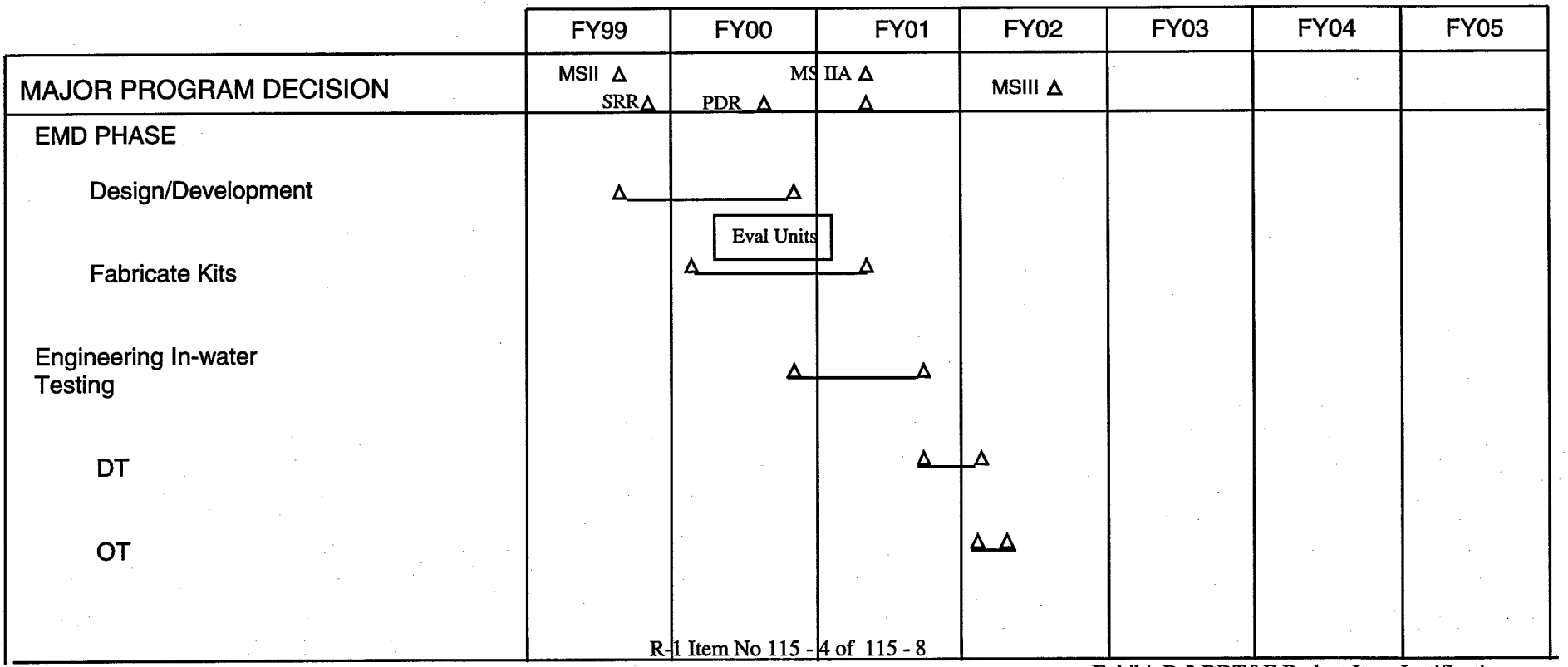


Exhibit R-2, RDT&E Budget Item Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY **RESEARCH, DEVELOPMENT, TEST & EVALUATION, NAVY/BA 5**	R-1 ITEM NOMENCLATURE MINE DEVELOPMENT/0604601N	

Technical: None.

C. Other Program Funding Summary :($ in Millions)

	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Complete	Total Cost
ISLMM WPN #322100	0.0	5.9	9.8	8.8	0.0	0.0	0.0	24.5

Related RDT&E:

	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Complete	Total Cost
Royal Australian Navy	3.5	4.0	5.0	0.0	0.0	0.0	0.0	12.5
10 USC 2350(a)	3.0	2.0	1.0	0.0	0.0	0.0	0.0	6.0

D. Acquisition Strategy:

The USN and RAN will cooperatively design ISLMM. The US Navy laboratories (NUWC, Newport RI/NSWC Panama City Fl), will team with qualified contractors to manufacture the kits to make the EMD models. NUWCDIVKPT, the USN depot for the MK48, will assemble the ISLMMs/EMD models for All up Round (AUR) testing.

Using existing hardware to the greatest extent possible, NSWC Coastal Systems Station will team with other Navy laboratories and hardware contractors to design and develop the LSM. They will utilize the existing CAPTOR case and active acoustic source, and the shallow-water variant of the MK 46 torpedo. New developments will include an high-frequency acoustic (receiver) array, a short-range two-way remote control system, and a high-frequency passive/active target tracking subsystem. Extensive modeling and simulation will be used throughout to reduce the need for expensive in-water testing as much as possible.

E. Schedule Profile: See Attached.

Exhibit R-3 Cost Analysis		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E,N/BA-5	PROGRAM ELEMENT NAME AND NUMBER MINE DEVELOPMENT/0604601N	PROJECT NAME AND NUMBER MINE DEVELOPMENT/Q0267

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date			Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	RCP	NUWCDIVNPT – Newport, RI NSWC, CSS – Panama City, FL	0.0	0.0	N/A	1.8	N/A			CONT.	CONT.	N/A
Ancillary Hardware Development												
Systems Engineering	WR	NUWCDIVNPT – Newport, RI NSWC, CSS – Panama City, FL	0.0	0.0	N/A	.9	N/A			N/A	.N/A	N/A
Licenses												
Tooling												
GFE												
Award Fees												
Subtotal Product Development						2.7				CONT.	CONT.	N/A
Remarks:												
Development Support Equipment												
Software Development	WR	NUWCDIVNPT – Newport, RI NSWC, CSS – Panama City, FL	0.0	0.0	N/A	0.1	10/1			CONT.	CONT.	N/A
Training Development												
Integrated Logistics Support	WR	NUWCDIVNPT – Newport, RI NSWC, CSS – Panama City, FL	0.0	0.0	N/A	0.2	10/1			CONT.	CONT.	N/A

Exhibit R-3 Cost Analysis		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E,N/BA-5	PROGRAM ELEMENT NAME AND NUMBER MINE DEVELOPMENT/0604601N	PROJECT NAME AND NUMBER MINE DEVELOPMENT/Q0267

Configuration Management												
Technical Data												
GFE												
Subtotal Support						0.3				CONT.	CONT.	N/A
Remarks:												

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	Fy00 Cost	FY00 Award Date			Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	NUWCDIVNPT – Newport, RI NUWCDIVKPT – Keyport, WA NSWC, CSS – Panama City, FL	0.0	0.0	N/A	0.3	N/A			CONT.	CONT.	N/A
Operational Test & Evaluation												
Tooling												
GFE												
Subtotal T&E						0.3				CONT.	CONT.	N/A
Remarks:												
Contractor Engineering Support												
Government Engineering Support												
Program Management Support	WR		0.0	.015	N/A	0.0	N/A		N/A	CONT.	CONT.	N/A
Program Management Personnel												
Travel												

Exhibit R-3 Cost Analysis		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E,N/BA-5	PROGRAM ELEMENT NAME AND NUMBER MINE DEVELOPMENT/0604601N	PROJECT NAME AND NUMBER MINE DEVELOPMENT/Q0267

Labor (Research Personnel)												
Overhead												
Subtotal Management				.015		0.0				CONT.	CONT.	N/A
Remarks:												
Total Cost				.015		3.3				CONT.	CONT.	N/A
Remarks:												

DATE: FEB 1999

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604603N
PROGRAM ELEMENT TITLE: Unguided Conventional Air-Launched Weapons

(U) COST: (Dollars in Thousands)

Project Number & Title	FY 1998 Budget	FY 1999 Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete	Total Program
A2183 SLAM ER	28,158	5,122	1,598	2,928	3,091	4,632	4,757	4,869	CONT.	CONT.
TOTAL	**28,158**	**5,122**	**1,598**	**2,928**	**3,091**	**4,632**	**4,757**	**4,869**	**CONT.**	**CONT.**
Quantity of RDT&E Articles	4									

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

(U) A2183/STANDOFF LAND ATTACK MISSILE - EXPANDED RESPONSE (SLAM ER) Description: This program funds the development of SLAM (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 missile planning and launch aircraft integration. The SLAM ER consists of both hardware and software upgrades to the missile.

(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.

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: FEB 1999

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604603N** **PROGRAM ELEMENT TITLE: Unguided Conventional Air-Launched Weapons** **PROJECT NUMBER: A2183** **PROJECT TITLE: SLAM ER**

(U) COST: (Dollars in Thousands)

Project Number & Title	FY 1998 Budget	FY 1999 Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete	Total Program
A2183 SLAM ER	**28,158**	**5,122**	**1,598**	**2,928**	**3,091**	**4,632**	**4,757**	**4,869**	**CONT.**	**CONT.**
TOTAL	**28,158**	**5,122**	**1,598**	**2,928**	**3,091**	**4,632**	**4,757**	**4,869**	**CONT.**	**CONT.**
Quantity of RDT&E Articles	4									

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:
A2183/STANDOFF LAND ATTACK MISSILE - EXPANDED RESPONSE (SLAM ER) Description: This program funds the development of SLAM (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 missile 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. The SLAM ER Mission Planning Module (MPM) development and modifications are required to remain compatible with the changes to the Tactical Aircraft Mission Planning System (TAMPS) and to migrate to the Joint Mission Planning System.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. FY 1998 ACCOMPLISHMENTS:

- (U) ($ 9,158) Continued engineering & manufacturing development (E&MD) efforts. Provided SLAM ER missile support.
- (U) ($ 1,081) Completed F/A-18 aircraft OFP-13C SLAM ER integration and flight clearance and developed the F/A-18 OFP-15C Automatic Target Acquisition (ATA) software.
- (U) ($ 1,000) Continued Osprey Jaywalker efforts.
- (U) ($ 12,024) Continued missile flight test and evaluation and completed ASN (RD&A) Program Review for Low Rate Initial Production (LRIP) II.
- (U) ($ 2,600) Completed warhead development and testing.
- (U) ($ 2,295) Continued systems engineering, government and contractor support.

DATE: FEB 1999

BUDGET ACTIVITY: 5 | PROGRAM ELEMENT: 0604603N | PROGRAM ELEMENT TITLE: Unguided Conventional Air Launched Weapons | PROJECT NUMBER: A2183 | PROJECT TITLE: SLAM ER

2. 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) ($ 1,615) Complete system engineering, government and contractor support.
- (U) ($ 56) Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15 USC 638.

3. FY 2000 PLAN:

- (U) ($ 907) Begin conversion of SLAM/SLAM ER TAMPS Mission Planning Module (MPM) into planning components for the Joint Mission Planning System (JMPS).
- (U) ($ 691) Continue Missile Flight Test and Evaluation to support TAMPS evolutionary acquisition strategy.

(U) B. PROGRAM CHANGE SUMMARY

	FY 1998	FY 1999	FY 2000
(U) FY 1999 President's Budget:	28,020	5,183	1,626
(U) Appropriated Value:	28,890	5,183	
(U) Adjustments from President's Budget:	+138	-61	-28
(U) FY 2000 President's Budget Submit:	28,158	5,122	1,598

CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY 98 net increase consists of decreases of -$330 thousand for Small Business Innovative Research (SBIR) assessment, -$279 thousand for higher Navy priorities and -$3 thousand for a minor program adjustment. These reductions are offset by an increase of $750 thousand for developing and testing of SLAM ER mission planning modules (TAMPS). The FY 99 decrease reflects reductions of –$41 thousand for Contract Advisory and Assistance Services and -$20 thousand for revised economic assumptions. The FY 00 decrease of -$28 thousand reflects minor program adjustments.

(U) Schedule: FY 98: Operational Test (OT) IIA and Operational Test Readiness Review (OTRR) have slipped one quarter due to software incompatibility with multiple TAMPS builds. FY 99: Milestone III, IOC and Full Rate Production (FRP) have slipped one quarter due to OPEVAL. Follow-on Test and Evaluation (FOT&E)/ATA and Full Rate Production (FRP)/ATA were added to better define ATA schedule.

(U) Technical: N/A

DATE: FEB 1999

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604603N** **PROJECT NUMBER: A2183**
PROGRAM ELEMENT TITLE: Unguided Conventional Air Launched Weapons **PROJECT TITLE: SLAM ER**

(U) C. OTHER PROGRAM FUNDING SUMMARY

Appn	FY 1998 Budget	FY 1999 Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete
WPN Line 8									
SLAM ER	0	39,294	38,088	30,641	29,225	28,767	29,478	30,094	211,482
WPN Line 17									
Harpoon Mods	20,716	0	0	0	0	0	0	0	0

Related RDT&E: N/A

(U) D. ACQUISITION STRATEGY: This is a non-ACAT I program with no specific acquisition strategies.

(U) E. SCHEDULE PROFILE:

	FY 1998	FY 1999	FY 2000	To Complete
(U) Program Milestones	2Q LRIP (II)	3Q MSIII		
(U) Engineering Milestones		3Q IOC		
(U) T&E Milestones	2Q/3Q DT-IID 3Q/98-1Q/99 OT-IIA 3Q OTRR	1Q OPEVAL 3Q/4Q FOT&E/ATA		
(U) Contract Milestones		3Q FRP	2Q FRP/ATA	

EXHIBIT R-3, FY 2000 RDT&E,N COST ANALYSIS

DATE: FEB 1999

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604603N

PROJECT NUMBER: A2183

PROJECT TITLE: SLAM ER

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	Cost to Complete	Total Cost	Target Value of Contract
TAMPS Software Development	SS/CPIF	BOEING, MO	123,712	1,500	1/99	630	1/00	CONT.	CONT.	
Miscellaneous	Various	Various	44,263	1,975	Various	277	11/99	CONT.	CONT.	
Subtotal Product Development			**167,975**	**3,475**		**907**		**CONT.**	**CONT.**	

Remarks:

Miscellaneous	WX		776	140	1/99	0		0	906	
Subtotal Support			**776**	**140**		**0**		**0**	**906**	

Remarks:

EXHIBIT R-3, FY 2000 RDT&E,N COST ANALYSIS DATE: FEB 1999

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604603N PROJECT NUMBER: A2183
PROJECT TITLE: SLAM ER

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Missile Flight T&E	WX	NAWC-WD China Lake	19,405	1,451	11/98	691	11/99	CONT.	CONT.	
Subtotal Test & Evaluation			**19,405**	**1,451**		**691**		**CONT.**	**CONT.**	
Remarks:										
Subtotal Management			**0**	**0**		**0**		**0**	**0**	
Remarks:										
SBIR Assessment				**56**						
Total Cost			**188,156**	**5,122**		**1,598**		**CONT.**	**CONT.**	

Exhibit R-2, RDT&E Budget Item Justification								Date: February 1999		
APPROPRIATION/BUDGET ACTIVITY RDT&E / 5					R-1 ITEM NOMENCLATURE Program Element (PE) Name and No. LIGHTWEIGHT TORPEDO DEVELOPMENT/0604610N					
COST ($ in Millions)	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Total P.E. Cost	15.773	7.929	9.297	8.684	7.966	2.895	2.996	1.747	CONT.	CONT.
Lightweight Hybrid Torpedo /V2234	13.829	7.929	9.297	8.684	7.966	2.895	2.996	1.747	CONT.	CONT.
Lightweight Hybrid Torpedo /V2435	1.944	0	0	0	0	0	0	0	CONT.	CONT.
Quantity of RDT&E Articles & cost	5.067	0.282	0.200	0.200						

A. (U) Mission Description and Budget Item Justification:
The funding is to design, integrate and test the Lightweight Hybrid Torpedo (MK54 MOD 0) by taking advantage of current USN investments in torpedo hardware and torpedo technology. The torpedo will be comprised of hardware and software from the MK 46 Torpedo, MK 50 Torpedo, and MK 48 ADCAP Torpedo. The Lightweight Hybrid Torpedo will provide performance improvements in shallow water, littoral, counter-measure filled environments. The Engineering Development Model (EDM) contract was awarded to Raytheon Systems Company (formerly Hughes Aircraft Company) in June 1996. Current contract to deliver twenty-one (21) EDM units (delivery of test articles will be completed in early FY00) to support the in-water test program.

1. (U) FY 1998 ACCOMPLISHMENTS:

- (U) ($5.067) Continued LHT Engineering and Manufacturing Development Contract.
- (U) ($3.226) Continued development and production of Ancillary Hardware, including Fleet Exercise Section (FES) and Automatic Test Equipment (ATE), to support LHT.
- (U) ($3.537) Continued development of tactical and signal processing software.
- (U) ($0.761) Conducted simulation efforts in support of tactical software development.
- (U) ($3.182) Performed Lightweight torpedo system engineering efforts.

Exhibit R-2, RDT&E Budget Item Justification	Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E / 5	R-1 ITEM NOMENCLATURE Program Element (PE) Name and No. LIGHTWEIGHT TORPEDO DEVELOPMENT/0604610N

2. (U) FY 1999 PLAN:

- (U) ($0.282) Continue LHT Engineering and Manufacturing Development Contract.
- (U) ($1.715) Continue development and production of Ancillary Hardware, including Fleet Exercise Section (FES) and Automatic Test Equipment (ATE) to support LHT.
- (U) ($2.322) Continue development of tactical and signal processing software.
- (U) ($1.403) Continue simulation and initiate in-water test program.
- (U) ($2.190) Continue Lightweight torpedo system engineering efforts.
- (U) ($0.017) Portion of extramural program is reserved for Small Business Innovation Research assessment in accordance with 15 USC 638.

3. (U) FY 2000 PLAN:

- (U) ($0.200) Continue LHT Engineering and Manufacturing Development Contract to provide support to Navy in-water test program.
- (U) ($0.801) Continue development and production of Ancillary Hardware, including Fleet Exercise Section (FES) and Automatic Test Equipment (ATE) to support LHT.
- (U) ($1.856) Continue development of tactical and signal processing software.
- (U) ($4.048) Continue simulation and in-water developmental test program.
- (U) ($2.392) Continue Lightweight torpedo system engineering efforts.

B. (U) Program Change Summary: ($ in millions)

Exhibit R-2, RDT&E Budget Item Justification	Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E / 5	R-1 ITEM NOMENCLATURE Program Element (PE) Name and No. LIGHTWEIGHT TORPEDO DEVELOPMENT/0604610N

	FY 1998	FY 1999	FY 2000
(U) FY 1999 President's Budget:	18.615	8.106	9.292
(U) Appropriated Value:	19.302	8.106	
(U) Adjustments to FY 1998 Appropriated Value/FY 1999 President's Budget:	-3.529	-0.177	-0.005
(U) FY 2000/01 PRES Budget Submit:	15.773	7.929	9.297

(U) Funding: FY98: $3.529M reduction due to –$0.662M for Congressional Undistributed reductions, -$0.267M for SBIR,–$1.100M for FY 1998 Below Threshold Reprogramming (BTR), and -$1.500M for FY98 Congressional Rescission.
FY99: Reduction of –$0.177M due to Congressional Undistributed Reductions.
FY00: Reduction of –$0.005M due to reduction of -$0.067M due to Congressional Undistributed Reductions and $0.062M addition due to minor pricing adjustments.

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

C. (U) Other Program Funding Summary ($ in millions)

	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Complete	Total Cost
Torpedo MK46 MODS (WPN / PE 0204228N/ BA3 / P-1 Item 321500)	0.266	0.015	28.699	25.204	29.610	35.534	37.833	38.809	296.192	491.881

Note: FY00 and Total Cost includes $1.7M for MK46 SLEP Kit Assembly completion. Adjusted values are $27.0M (FY00) and $490.2M (Total Cost).

(U) RELATED RDT&E:

Vertical Launch ASROC (RDT&E,N / PE 0604355N / BA5)	8.488	0	0	0	0	0	0	0	0	8.488

D. (U) Acquisition Strategy: The EMD contract is currently held by Raytheon Systems Company (formerly Hughes Aircraft Company). The contract was awarded as a Cost-Plus-Award Fee in June 1996 and was recently converted to Cost-Plus-Fixed Fee in April 1998.

Exhibit R-2, RDT&E Budget Item Justification	Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E / 5	R-1 ITEM NOMENCLATURE Program Element (PE) Name and No. LIGHTWEIGHT TORPEDO DEVELOPMENT/0604610N

E. Schedule Profile:

Lightweight Hybrid Torpedo Planning Schedule

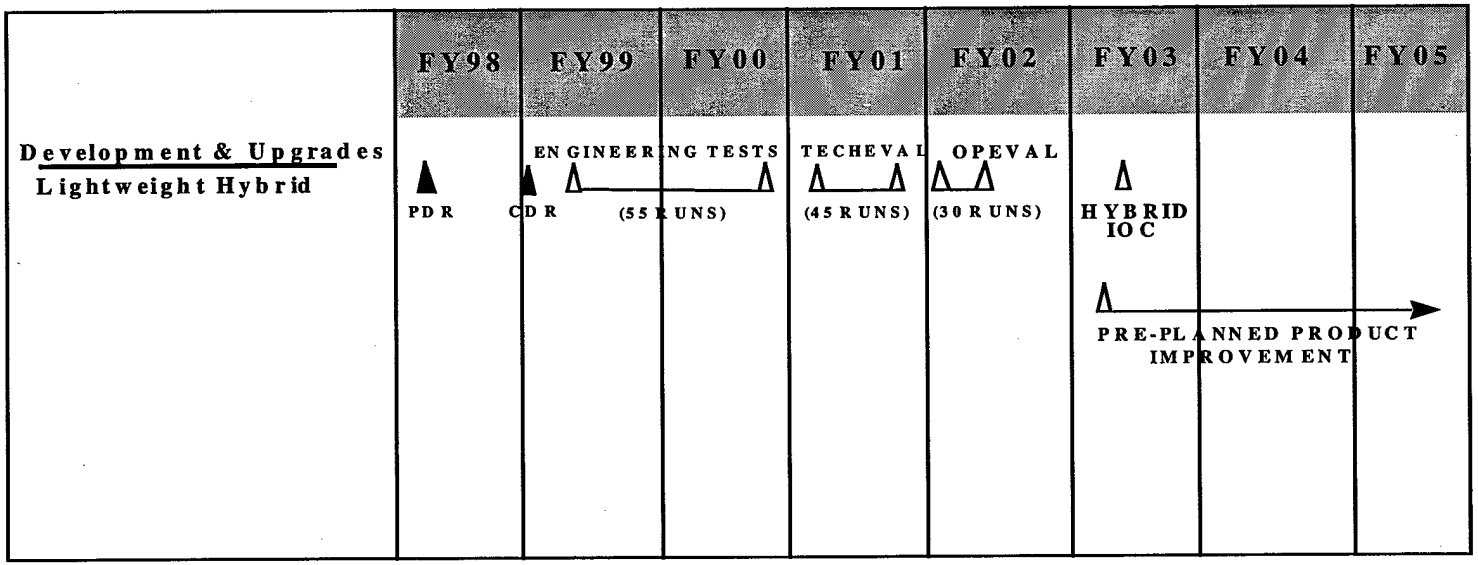


Exhibit R-3 Cost Analysis										Date: February 1999		
APPROPRIATION/BUDGET ACTIVITY : RDT&E,N/5		PROGRAM ELEMENT NAME AND NUMBER: LIGHTWEIGHT TORPEDO DEVELOPMENT/0604610N								PROJECT NAME AND NUMBER: Lightweight Hybrid Torpedo/V2234		
Cost Categories: Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date	FY01 Cost	FY01 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development												
	C,CPFF	Raytheon Systems Company	18.777	0.282	1 APR	0.200	01 OCT			0.200	19.459 *	25.559**
Ancillary Hardware Development												
	WR	NUWC Newport/Keyport	CONT.	1.715	24 NOV	0.801	01 OCT			CONT.	CONT.	N/A
Systems Engineering												
	WR	NUWC Newport/Keyport	CONT.	1.630	24 NOV	1.832	01 OCT			CONT.	CONT.	N/A
Software Development												
	WR	NUWC Newport	CONT.	2.322	24 NOV	1.856	01 OCT			CONT.	CONT.	N/A
Subtotal Product Development			CONT.	5.949		4.689				CONT.	CONT.	

Remarks: * Total Cost of $19.459M represents the planned use of appropriated funds for this program.
** A contract modification to the existing EMD contract was processed in December 1998 which exchanged $6.1M (Consideration) for Government non-excess personal property (permitted under 40 USC 481(c)). This exchange of non-excess torpedoes for consideration ($6.1M) has been added to the current total cost of $19.5M which increases the total estimated target value of the contract to $25.559M.

Subtotal Support												

Remarks: None.

Exhibit R-3 Cost Analysis													Date: February 1999
APPROPRIATION/BUDGET ACTIVITY : RDT&E,N/5			PROGRAM ELEMENT NAME AND NUMBER: LIGHTWEIGHT TORPEDO DEVELOPMENT/0604610N										PROJECT NAME AND NUMBER: Lightweight Hybrid Torpedo/V2234
Cost Categories (Tailor to WBS or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY 99 Award Date	FY00 Cost	FY00 Award Date	FY01 Cost	FY01 Award Date	Cost To Complete	Total Cost	Target Value of Contract	
System, Test & Evaluation													
	WR	COMOPTEVFOR	CONT.	0.035	6 NOV	0.066	01 OCT			CONT.	CONT	N/A	
	WR	NUWC Newport/Keyport	CONT.	1.385	24 NOV	3.982	01 OCT			CONT.	CONT.	N/A	
Subtotal T&E			CONT.	1.420		4.048				CONT.	CONT.		
Remarks: None.													
Program Management Support	Various	Various	CONT.	0.560	MISC.	0.560	MISC.			CONT.	CONT.		
Subtotal Management			CONT.	0.560		0.560				CONT.	CONT.		
Remarks: None.													
Total Cost			CONT.	7.929		9.297				CONT.	CONT.		
Remarks: None.													

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE: February 1999
BUDGET ACTIVITY: 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE: 0604612M Marine Corps Mine/Countermeasures Systems	PROJECT: C2106

COST *(In Thousands)*	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
C2106 ADVANCED COUNTERMEASURES SYSTEMS (ACS)	616	3791	1002	897	528	0	0	0	0	6834
Quantity of RDT&E Articles										

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

(U) The ACS program is a "tool box" approach, using a variety of systems, each of which center on a particular aspect of the detection and 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 detection, 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.

(U) **Justification for Budget Activity**: 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.

(U) FY 1998 Accomplishments:

- (U) $ 270 **Expeditionary Mine Clearance Systems:** Purchased remote control kit, integrate on the D8 dozer, test and evaluate its capability.
- (U) $ 60 **Advanced Mine Detector Program:** Funded Program Determination and Risk Reduction (PDRR).
- (U) $ 286 **Contractor Support:** Update program documentation, and provide management support.

(U)Total $ 616

(U) FY 1999 Planned Program:

•	(U) $	2976	**Expeditionary Mine Clearance Systems:** Procure, test and evaluate Flail system.
•	(U) $	500	**Ground Marking System:** Remanufacture existing Pathfinder Marking System. Integrate, test and evaluate with Flail system and with armorered combat excavators.
•	(U) $	295	**Contractor Support:** Update all program documentation and provide management support.
•	(U) $	20	Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15 USC 638.
	(U)Total $	3,791	

(U) FY 2000 Planned Program:

•	(U) $	798	AMD: Remanufacture and engineering the prototype system to reduce power and weight requirements. Streamline the system for operational use.
•	(U) $	161	AMD: Contractor support to update program documentation and provide management support.
•	(U) $	43	AMD: Test and evaluate for validating the remanufacture and engineering efforts
	(U)Total $	1,002	

B. (U) Project Change Summary

	FY 1998	FY 1999	FY 2000
(U) Previous President's Budget	912	3855	7119
(U) Adjustments to Previous President's Budget	-296	-64	-6117
(U) Current Budget Submit	616	3791	1002

(U) Change Summary Explanation:

(U) Funding: FY 1998 adjustment reflects adjustment of -$429K and a internal reprogramming increase of $133K.
FY 1999 decrease reflects a economic assumption, a CAAS reduction.
FY2000 reflects a decrease of $6103K and a decrease of $14K for economic assumption adjustments.

(U) Schedule: Not applicable

(U) Technical: Not applicable

	DATE
	February 1999

BUDGET ACTIVITY	PE NUMBER AND TITLE
5 - Engineering and Manufacturing Development	0604612M Marine Corps Mine/Countermeasures Systems

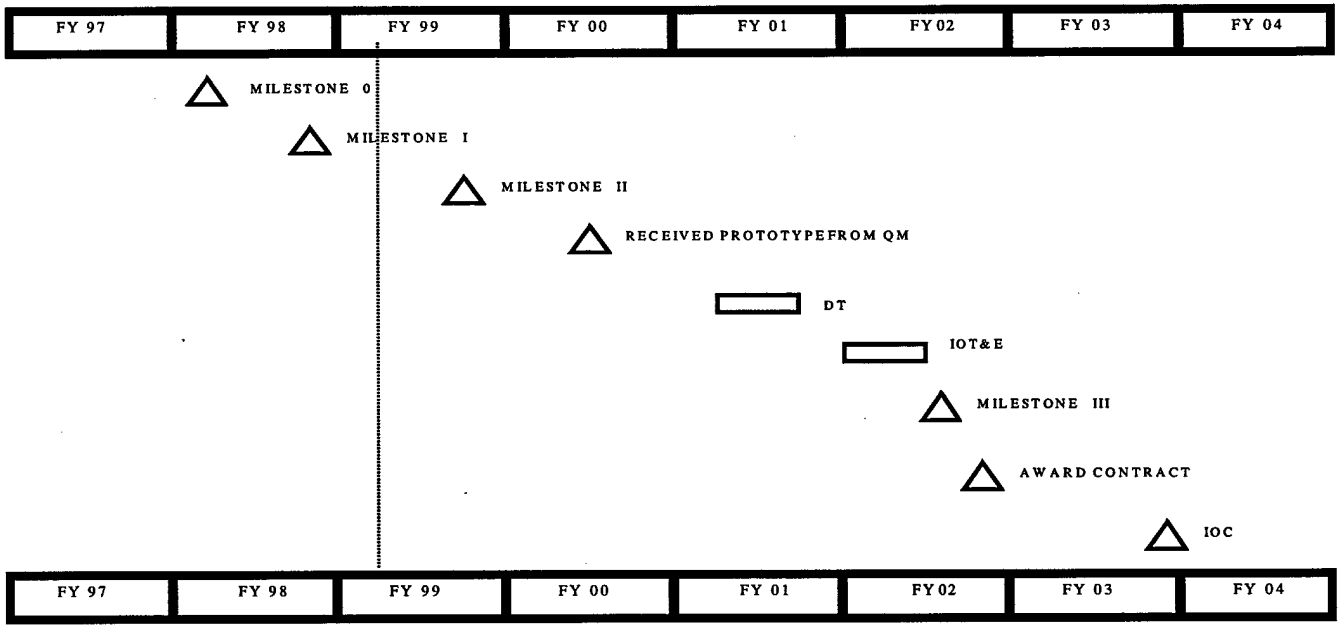
C. (U) Other Program Funding Summary (APPN, BLI #, NOMEN)	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Compl	Total Cost
(U) PMC, BLI# 632500, Demolitions Support Systems	0	2,931	8358	5551	0	2033	3612	5303	CONT	CONT

(U) Related RDT&E

(U) PE 0602131M (Marine Corps Landing Force Technology)
(U) PE 0603612M (Marine Corps Mine/Countermeasures Systems)
(U) PE 0603640M (Marine Corps Advanced Technology Demonstrations)

D. (U) Schedule Profile:

ADVANCED MINE DETECTOR SCHEDULE



RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)

DATE: February 1999

BUDGET ACTIVITY: 5 - Engineering and Manufacturing Development

PE NUMBER AND TITLE: 0604612M Marine Corps Mine/Countermeasures Systems

PROJECT: C2106

A. (U) Project Cost Breakdown

	FY 1998	FY 1999	FY 2000
Product Development	160	2666	798
Support and Management	406	510	161
Test and Evaluation	50	615	43
Total	616	3791	1002

B. Budget Acquisition History and Planning Information

Performing Organizations

Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	FY 1998	FY 1999	FY 2000	Budget to Complete	Total Program
Product Development Organizations										
TACOM	MIPR						2666		0	2666
TYNDALL, AFB	MIPR					160	0		0	160
QUANTUM MAGNETIC	MIPR							798	417	1215
Support and Management Organizations										
TACOM	MIPR					40	250		0	290
MKI	RCP					226	200	136	189	751
NWS, SEAL BEACH	WR					83	20		0	103
NSWC FALLBROOK	WR							15	30	45
PM SUPPORT						57	40	10	19	126
Test and Evaluation Organizations										

TACOM	MIPR				535		0	535
QUANTUM MAGNETICS	MIPR			50	80		0	130
APG, MD.	MIPR					43	770	813

Government Furnished Property

Item Description	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Delivery Date	Total Prior to FY 1998	FY 1998	FY 1999	FY 2000	Budget to Complete	Total Program
Product Development Property									
Support and Management Property									
Test and Evaluation Property									

	Total Prior to FY 1998	FY 1998	FY 1999	FY 2000	Budget to Complete	Total Program
Subtotal Product Development		160	2666	798	417	4041
Subtotal Support and Management		406	510	161	238	1315
Subtotal Test and Evaluation		50	615	43	770	1478
Total Project		616	3791	1002	1425	6834

EXHIBIT R-2, FY 2000 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604618N
PROGRAM ELEMENT TITLE: Joint Direct Attack Munition (JDAM)

(U) COST: (Dollars in Thousands)

Project Number & Title	FY 1998 Budget	FY 1999 Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete	Total Program
E2137 JDAM										
TOTAL	**15,389**	**11,160**	**11,782**	**26,455**	**39,231**	**34,462**	**38,309**	**25,457**	**0**	**311,196**
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	114

(U) A. 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 upgrade is accomplished by the addition of a guidance tail kit to existing General Purpose Bombs. 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. 114 Guided Test Vehicles (GTVs) were procured in FY96 during the Engineering & Management Development (E&MD) contract.

DATE: February 1999

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604618N** **PROJECT NUMBER: E2137**
PROGRAM ELEMENT TITLE: Joint Direct Attack Munition (JDAM) **PROJECT TITLE: JDAM**

(U) COST: (Dollars in Thousands)

Project Number & Title	FY 1998 Budget	FY 1999 Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete	Total Program
E2137 JDAM										
TOTAL	**15,389**	**11,160**	**11,782**	**26,455**	**39,231**	**34,462**	**38,309**	**25,457**	**0**	**311,196**
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(U) A. 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 upgrade is accomplished by the addition of a guidance tail kit to existing General Purpose Bombs. 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. 114 Guided Test Vehicles (GTVs) were procured in FY96 during the Engineering & Management Development (E&MD) contract.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. FY 1998 ACCOMPLISHMENTS:

- (U) ($ 5,638) Continued Developmental Testing (DT), and initiated Operational Testing (OT-IIB) (OPEVAL).
- (U) ($ 1,431) Continued Operation Flight Program (OFP) software activities supporting flight testing and aircraft integration, and continued JDAM Mission Planning Module (MPM) development for TAMPS.
- (U) ($ 1,886) Continued to incrementally fund JDAM Test Assets (GTVs) initially procured in FY96 and FY97.

- (U) ($ 4,894) Performed systems engineering, ILS and program support for the JDAM E&MD Phase II, LRIP II decision, and performed systems engineering support for the Concept Exploration (CE) phase of the JDAM Product Improvement Program (PIP) development program.
- (U) ($ 1,169) Continued support of the JDAM aircraft integration effort for the 1000# variant.
- (U) ($ 371) Continued systems engineering, ILS, program support, and testing for Joint Programmable Fuze (JPF) E&MD program.

2. FY 1999 PLAN:

- (U) ($ 2,634) Complete OT-IIB (OPEVAL) testing, and OT-IIB (Verification of the Correction of the Deficiency (VCD)).
- (U) ($ 385) Continue OFP software activities supporting flight testing and aircraft integration, and continue JDAM MPM support for TAMPS.
- (U) ($ 4,574) Perform systems engineering, ILS and program support for the JDAM E&MD Phase II, MS-III decision, fleet deployment IOC, and continue to perform systems engineering support for the CE phase of the JDAM PIP development program.
- (U) ($ 3,450) Continue to support the JDAM aircraft integration effort for the 1000# variant.
- (U) ($ 117) Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15 USC 638.

3. FY 2000 PLAN:

- (U) ($ 566) Continue JDAM MPM support for TAMPS.
- (U) ($ 8,433) Perform systems engineering, ILS and program support for the 1000# LRIP decision, and continue to perform systems engineering support for the JDAM PIP development program.
- (U) ($ 2,783) Continue to support the JDAM aircraft integration effort for the 1000# variant.

DATE: February 1999

BUDGET ACTIVITY: 5 | PROGRAM ELEMENT: 0604618N | PROGRAM ELEMENT TITLE: Joint Direct Attack Munition (JDAM) | PROJECT NUMBER: E2137 | PROJECT TITLE: JDAM

(U) B. PROGRAM CHANGE SUMMARY

	FY 1998	FY 1999	FY 2000
(U) FY 1999 President's Budget:	12,003	11,738	11,699
(U) Appropriated Value:	12,003	11,738	
(U) Adjustments from Pres Budget:	+3,386	-578	+83
(U) FY 2000 President's Budget Submit:	15,389	11,160	11,782

CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY98 increase of $3,386 thousand reflects a decrease of -$500 thousand for a Below Threshold Reprogramming (BTR), a -$414 thousand decrease for the Small Business Innovative Research (SBIR) transfer, a BTR increase of $1,900 thousand to fund the Boeing EM&D contract, and a BTR increase of $2,400 thousand to fund the OPEVAL flight testing. The FY98 BTR of $1,900 thousand and $2,400 thousand represent an exchange of FY97 dollars for FY98 to fund a portion of the F/A-18 shortfall. The FY99 decrease of -$578 thousand reflects a reduction of -$535 thousand for contract advisory and assistance services, and a decrease of -$43 thousand for revised economic assumptions. The FY00 increase of $83 thousand reflects an addition of $300 thousand to fully fund the JDAM PIP program and a decrease of -$217 thousand for various minor program adjustments.

(U) Schedule: The rephasing of test requirements has resulted in the following changes: DT-IIIB to 1Q98/3Q98, OT-IIB to 4Q98/1Q99; OT-III 2Q98/3Q98 to DT/OT 3Q98/3Q98; DT Assist 1Q98/2Q98, DT-Fin Lock 1Q99/1Q99, and OT-IIB (VCD) 2Q99/2Q99 were added.
(U) Technical: Not Applicable.

(U) C. OTHER PROGRAM FUNDING SUMMARY

Appn	FY 1998 Budget	FY 1999 Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete
PAN,MC/B.A-1 Ammunition-JDAM	25,050	37,815	35,563	29,628	30,177	64,990	66,354	67,693	346,701
Related RDT&E									
(U) P.E. 0604618F Air Force JDAM	21,054	11,954	1,385	1,169	1,578				

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604618N** **PROJECT NUMBER: E2137**
PROGRAM ELEMENT TITLE: Joint Direct Attack Munition (JDAM) **PROJECT TITLE: JDAM**

(U) C. ACQUISITION STRATEGY: The Joint Direct Attack (JDAM) program acquisition strategy is derived from the 1994 Federal Acquisition Streamlining Act (FASA). The focus of the program is to reduce acquisition management costs by buying bomb modification kits as if they were commercial items, including obtaining waivers to regulations that affect the efficiency of the contracting process. The JDAM contracting officer has authority to approve individual deviations from any Federal Acquisition Regulation (FAR) and Defense Acquisition Regulation Supplement (DFARS) provision not required by Statute of Executive Order for the JDAM EMD contract. The contract management philosophy includes partnering with the contractor, long term relationships with vendors, negotiations based on prices instead of costs, credit for past performance, and allowing the contractor to determine how to produce the product with the government providing only what the product must do. Cost is an independent variable. JDAM kits have a lifetime (20 year) warranty, significantly reducing Operating and Support costs.

(U) D. SCHEDULE PROFILE

	FY 998	FY1999	FY2000
(U) Program Milestones	3Q LRIP	2Q MS-III 4Q IOC	
(U) Engineering Milestones			
(U) T&E Milestones	DT-Assist 1Q98/2Q98 DT-IIIB 1Q98/3Q98 DT/OT 3Q98 OT-IIB 4Q98/1Q99	DT-Fin Lock 1Q99 OT-IIB (VCD) 2Q99	
(U) Contract Milestones			

EXHIBIT R-3, FY 2000 RDT&E,N COST ANALYSIS

DATE: Feb 1999

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604618N

PROJECT NUMBER: E2137

PROJECT TITLE: JDAM

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Product Development										
CMBRE Development	MIPR	ASC/LDA	1,582						1,582	
OFP Development	WX	WSSA/CL	17,130	151	11/98	31	11/99	4,642	21,954	
TAMPS Development	C/CPAF	Raytheon	5,404	45	11/98	267	11/99	13,225	18,941	18,941
Aircraft Integration	SS/CPAF	Boeing	6,243	500	12/98	2,783	6/00	2,823	12,349	12,349
PIP Development	C/CPAF	Boeing	1,015	942	6/99	3,740	6/00	85,791	91,488	91,488
In-house Support	WX	NAWC/CL	40,178	2,627	10/98	4,055	10/99	23,739	70,599	
Misc. (efforts under $1M – Aggregate)	Various	Various	3,469	145	10/98				3,614	
Subtotal Project Development			**75,021**	**4,410**		**10,876**		**130,220**	**220,527**	
Remarks										
Support Costs										
Travel	Project Directive	JDAM	1,140	89	10/98	110	10/99	710	2,049	
Engineering Services	Various	Various	7,729	1,040	10/98	660	10/99	6,295	15,724	
Subtotal Support			**8,869**	**1,129**		**770**		**7,005**	**17,773**	
Remarks										

EXHIBIT R-3, FY 2000 RDT&E,N COST ANALYSIS DATE: Feb 1999

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604618N PROJECT NUMBER: E2137
PROJECT TITLE: JDAM

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Test and Evaluation										
Development Test	WX	NAWC/CL	12,743	1,683	10/98			6,939	21,365	
Operational Test	PD	OPTEVFOR	4,756	951	10/98			1,896	7,603	
Test Assets	MIPR/ C/CPAF	BOEING	12,985	2,760	7/99			16,281	32,026	32,026
Award Fee	MIPR/ C/CPAF	BOEING	904						904	904
Misc. (efforts under $1M – Aggregate)	Various	Various	3,857						3,857	
Subtotal Test & Evaluation			**35,245**	**5,394**		**0**		**25,116**	**65,755**	
Remarks										
Management Services										
Misc. (efforts under $1M – Aggregate	Various	Various	5,204	227	10/98	136	10/99	1,574	7,141	
Subtotal Management			**5,204**	**227**		**136**		**1,574**	**7,141**	
Remarks										
Total Cost			**124,339**	**11,160**		**11,782**		**163,915**	**311,196**	

Exhibit R-2, RDT&E Budget Item Justification	Date: February 1999
APPROPRIATION/BUDGET ACTIVITY **RDT&E,N/BA 5**	R-1 ITEM NOMENCLATURE Joint Service Explosive Ordnance Disposal (EOD) Development/0604654N

COST ($ in Millions)	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Total P.E. Cost	6.4	7.0	7.1	7.2	7.3	7.5	7.7	7.9	Continuing	Continuing
EOD Procedures/Q1829	6.4	7.0	7.1	7.2	7.3	7.5	7.7	7.9	Continuing	Continuing
Quantity of RDT&E Articles & cost	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		

A. 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 Improved Nuclear Devices (INDs). The program also provides for the acquisition of high priority foreign sea mines. The analysis and exploitation of these sea mines will provide for the development of MCM and unique EOD procedures. CNO approved NAPDD 502-852 provides the program definition and scope of effort.

PROGRAM ACCOMPLISHMENTS AND PLANS:

1. FY 1998 ACCOMPLISHMENTS:

- ($4.852) Obtained foreign ordnance and developed EOD render-safe procedures for new sophisticated domestic and foreign ordnance.
- ($1.064) Developed IND countermeasures procedures and participated in exercises and joint working groups.
- ($.483) Obtained high priority foreign sea mines for an analysis and exploitation which provided for the development of Mine Countermeasures (MCM) procedures.

2. FY1999 PLAN:

- ($5.232) Continue to obtain foreign ordnance and develop EOD render-safe procedures for new sophisticated domestic and foreign ordnance.
- ($1.037) Continue to develop IND countermeasures procedures and participate in exercises and joint working groups.
- ($.752) Continue to obtain high priority foreign sea mines for analysis and exploitation to provide for the development of MCM procedures.

3. FY 2000 PLAN:

- ($5.227) Continue to obtain foreign ordnance and develop EOD render-safe procedures for new sophisticated domestic and foreign ordnance.
- ($.922) Continue to develop IND countermeasures procedures and participate in exercises and joint working groups.
- ($.984) Continue to obtain high priority foreign sea mines for analysis and exploitation to provide for the development of MCM procedures.

Exhibit R-2, RDT&E Budget Item Justification	Date: February 1999
APPROPRIATION/BUDGET ACTIVITY **RDT&E,N/BA 5**	R-1 ITEM NOMENCLATURE Joint Service Explosive Ordnance Disposal (EOD) Development/0604654N

B. Program Change Summary:

	FY 1998	FY 1999	FY 2000
FY 1999 President's Budget:	6.416	7.037	7.160
Appropriated Value:	6.613	7.037	
Adjustment to FY 1998 Appropriated Value/			
FY 1999 President's Budget:	- .214	-.016	-.027
FY 2000 PRES Budget Submit:	6.399	7.021	7.133

Funding: Adjustments are due to general reductions.

Schedule: Not applicable.

Technical: Not applicable.

C. Other Program Funding Summary: Not applicable.

FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Complete	Total Cost

D. Acquisition Strategy: This is a non-acquisition program.

E. Schedule Profile: Not applicable.

Exhibit R-2, RDT&E Budget Item Justification	Date: February 1999
APPROPRIATION/BUDGET ACTIVITY **RDT&E,N/BA 5**	R-1 ITEM NOMENCLATURE Joint Service Explosive Ordnance Disposal (EOD) Development/0604654N

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date			Cost To Complete	Total Cost	Target Value of Contract
RSP Development	WR	EODTD, IH, MD	122.282	4.325	10/98	4.318	10/99			CONT.	CONT.	
IND Countermeasures	WR	EODTD, IH, MD	22.016	.848	10/98	.750	10/99			CONT.	CONT.	
Foreign Mine Acquisition	WR	Various	.483	.630	10/98	.830	10/99			CONT.	CONT.	
Program Managment Personnel	WR	EODTD, IH, MD	1.000	.165	10/98	.165	10/99			CONT.	CONT.	
Miscellaneous	Various	Various	1.000	1.053	2/99	1.070	2/00			CONT.	CONT.	
Subtotal Product Development	Various	Various	146.781	7.021		7.133				CONT.	CONT.	
Remarks:												
Development Support Equipment												
Software Development												
Training Development												
Integrated Logistics Support												
Configuration Management												
Technical Data												
GFE												
Subtotal Support												

Exhibit R-2, RDT&E Budget Item Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY **RDT&E,N/BA 5**	R-1 ITEM NOMENCLATURE Joint Service Explosive Ordnance Disposal (EOD) Development/0604654N	

Exhibit R-2, RDT&E Budget Item Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY **RDT&E,N/BA 5**	R-1 ITEM NOMENCLATURE Joint Service Explosive Ordnance Disposal (EOD) Development/0604654N	

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FY 2000/2001 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: January 1999

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604703N PROGRAM ELEMENT TITLE: Personnel, Training, Simulation, and Human Factors PROJECT NUMBER: L1822 PROJECT TITLE: Personnel, Training, Simulation, and Human Factors

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1998 ACTUAL	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	TOTAL PROGRAM
L1822 Personnel, Training, Simulation, and Human Factors	980	1,232	1,252	1,283	1,314	1,351	1,395	1,443	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 modeling, econometric forecasting, simulation, decision support systems, and new database and communications configuration.

(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 1998 ACCOMPLISHMENTS:

- (U) ($232K) Began transition of the proof of concept prototype model developed under the successful 6.3 Assignment Policy Management System (APMS) subproject. APMS capabilities were integrated into the development of the Job Advertisement and Selection System (JASS) within the Military Assignment, Selection, and Transfer (MAST) System. APMS provides a tool to execute new policy initiatives such as Home-Basing policy.
- (U) ($150K) Completed system documentation and user acceptance testing for the Medical Manpower Allocation Model.
- (U) ($270K) Completed development of the manpower rate forecasting models to improve forecasting projections of the Military Personnel Navy (MPN) Appropriation changes.
- (U) ($340K) Pilot tested the intelligent overbooking component of the Navy Training Quota Management System (NTQMS) for "A" Schools. Developed "booking profiles" for each class from history and matched current bookings against the profile. NTQMS allows the Navy to get the most training "yield" from it's training resources, maximizing "show-up" rates, seat fill, and minimizing awaiting instruction time. The system enables training

quota managers 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.

- (U) (-$12K) Small Business Innovative Research (SBIR) Program.

2. (U) FY 1999 PLAN:

- (U) ($300K) Continue development of Navy Training Quota Management System (NTQMS). Expand testing of NTQMS to ten ratings, including A-school pipelines. Assess user requirements and develop user tools. Develop prototype graphical displays and graphical user interfaces. Pilot test the capacity allocation component for "C" schools to allocate training pipeline quotas and to maximize throughput to the fleet.

- (U) ($285K) Continue development of the Assignment Policy Management System (APMS). APMS will be expanded to meet the requirements of the remaining enlisted communities, which will require expansion of the model's algorithms, processing logic, interfaces, and databases. Pilot test the enlisted assignment and distribution metrics and the detailer decision rules. A Test & Evaluation Study will be completed by end FY 1999.

- (U) ($347K) Begin transition of Quality of Life (QOL) Contributions to Navy Readiness Outcomes project from previous Navy and Marine Corps 6.3 projects. This FY-99 new start will design and implement a QOL Assessment System and methodology that can be applied to the entire spectrum of QOL programs to evaluate their impact and to be used for budgeting and resource allocation.

- (U) ($300K) Begin development of the Retention Monitoring and Reporting System to transition several 6.1, 6.2, and 6.3 research projects. The system will transform raw personnel transaction data into decision-making information with access via Internet and IT-21. Artificial intelligence techniques and advanced visual information filtering through a visually-oriented interface will be used to identify specific personnel categories where retention problems are emerging, to better understand retention, and to support personnel readiness goals.

3. (U) FY 2000 PLAN:

- (U) ($150K) Complete development of Navy Training Quota Management System (NTQMS). Apply NTQMS for A-schools. Pilot test NTQMS for recruit Delayed Entry Program (DEP) pool management and for recruit/fleet reallocations for selected ratings. Integrate prototypes during the pilot test. Develop a prototype Recruit Quota Monitor decision support system. Apply and pilot test NTQMS for C-schools. Develop training materials and train Quota Management Office personnel on the system.

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604703N PROGRAM ELEMENT TITLE: Personnel, Training, Simulation, and Human Factors

PROJECT NUMBER: L1822 PROJECT TITLE: Personnel, Training, Simulation, and Human Factors

- (U) ($125K) Complete development of the Assignment Policy Management System (APMS). Complete necessary refinements to the model following an assessment of the results of a Test and Evaluation Study of APMS.
- (U) ($350K) Continue development of the Quality of Life Contributions to Navy Readiness Outcomes model. Develop and pilot test program specific assessment system. Within each life domain, compare individual program contributions to QOL and relevant mission outcomes, cost per user, and mission outcomes based on program installation-related variances in implementation. Develop a prototype database and a decision support system.
- (U) ($300K) Continue development of the Retention Monitoring and Reporting System. Develop and incorporate data mining and intelligent agent techniques to identify specific emerging personnel retention problems.
- (U) ($327K) Begin transitioning products from 6.3 Computer Communications Technology for Recruiting Project.

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1998	FY 1999	FY 2000
(U) FY 1999 President's Budget:	992	1,235	1,232
(U) Appropriated Value:	980	1,235	1,232
(U) Adjustments from FY 1999 PRESBUDG:	-12	-3	+20
(U) FY 2000/2001 Pres Budget Submission:	980	1,232	1,252

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1998 funding adjustment (-12K): Applied to Small Business Innovative Research (SBIR) Program.
FY 1999 funding adjustment (-3K): Attributed to revised economic assumption.
FY 2000 funding adjustment (+20K): Civilian Pay Rates (+38K) and Non-pay inflation (-18K).
FY 2001 funding adjustment (+27K): Civilian Pay Rates (+47K) and Non-pay inflation (-20K).

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

FY 2000/2001 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: January 1999

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604703N PROGRAM ELEMENT TITLE: Personnel, Training, Simulation, and Human Factors

PROJECT NUMBER: L1822 PROJECT TITLE: Personnel, Training, Simulation, and Human Factors

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.

FY 2000 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 199

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604710N
PROGRAM ELEMENT TITLE: Navy Energy Program (ENG)

A. (U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1998 ACTUAL	FY 1999 ESTIMATE	FY2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
R0371	2,830	3,530	5,446	5,586	5,853	5,951	6,125	6,268	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; existing gas turbine engine efficiency improvements, anti-fouling paints, air conditioning and lighting for ships; and adaptation of renewable/alternative energy technologies to Navy facility needs. Provide engineering development, and 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 Legislated, White House, DoD, and Navy Energy Management Goals; and also address the Office of the Secretary of Defense, 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 (JMA)/Warfare Areas: This program directly supports the following JMA's: Strike, Littoral Warfare, Sea and Air Superiority, Strategic Mobility, Readiness, and Support and Infrastructure.

FY 2000 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: February 1999

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 1998 ACCOMPLISHMENTS:
   - (U) ($537) Aircraft: Developed fleet requested enhancements of Flight Optimization Routines for Energy Management (FOREM) software and began conversion to WINDOWS format. Provided FOREM cruise and loiter algorithms for P-3C to contractor developing P-3 Flight Performance Advisory System (FPAS) which will be installed on the aircraft and capable of manual input operations by Dec 1998 (takeoff, climb, descent and landing algorithms also delivered). Provided palmtop portable computers running FOREM to Marine Corps squadrons for in-the-field flight planning. Initiated joint effort to provide certified FOREM flight performance data to the tactical aircraft mission planning system (TAMPS) program for use in their stand alone flight planner. They will pay for translation of existing FOREM databases and we will cost share database development for additional aircraft of mutual interest.
   - (U) ($886) Ships: Installed stern flap on USS A.W.Radford (DD968) test ship for powering trials: fuel consumption savings were more than twice that predicted from model tests; acoustic tests showed no adverse impact. Supported endurance test of modified air conditioning plant (R114 replacement program), monitoring efficiency. Continued advanced easy release and ablative copper/cobiocide anti-fouling coating ship trials; belly stripe and hull patch performance demonstrations; and life cycle management studies.
   - (U) ($1,407) 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. Continued development of a high efficiency low emissions power generation concept. Provided systems engineering support for renewable energy sources to all services, in response to DoD wide technical lead assignment.

2. (U) FY 1999 PLAN:
   - (U) ($720) Aircraft: WINDOWS version of FOREM will be developed, tested and distributed to fleet for F/A-18A/B/C/D, F-14A/B/D, EA-6B, TA-4J, T-45, AV-8B and P-3C platforms. Monitor P-3 contracted development of airframe to computer interfaces required to automate P-3 FPAS sensor inputs (e.g. fuel flow, external winds and

temperature, MACH NO. and altitude). Provide palmtop portable computers running FOREM to additional Marine squadrons. Provide TAMPS with FOREM databases for F-14, and additional aircraft TBD. Begin FOREM flight performance database development for additional aircraft of interest mainly to TAMPS (e.g. S-3B, E-2C, CH-53E).

- (U) ($1,120) Ships: Conduct pre-installation powering trials for TAO-187 hydrodynamic mods and DDG-51 retrofit stern flap or wedge/flap combination. Support test and evaluation (T&E) of new 125 ton air-conditioning plant with optimized impeller/compressor designed to avoid efficiency losses in R114 replacement program. T&E life cycle management procedures for advanced hull coatings. Conduct panel tests of self-polishing copper/cobiocide paint. Continue to monitor large-scale test applications of other easy release and advanced copper hull paints.
- (U) ($1,657) Facilities: Investigate PV/Fuel Cell hybrid power system technology/concepts. Accelerate the development of high efficiency, low emissions, power generation concept. Support and T&E of PV/Diesel hybrid power systems for off-grid applications. Continue systems engineering support for renewable energy power systems as DoD assigned technical lead.
- (U) ($33) Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15 USC 638.

3. (U) FY 2000 PLAN:

- (U) ($990) Aircraft: Complete conversion of FOREM software to WINDOWS format and deliver to C-9, C-130, and C-2. Extend FOREM to additional aircraft such as MV-22, E-6A, F/A-18E/F. Provide TAMPS program with FOREM data, to eliminate duplication of effort, for requested aircraft classes. Cost share contracted effort to automate P-3 FPAS; assist in performance validation of F/A-18E/F FPAS.
- (U) ($1,992) Ships: Install and conduct powering trials for DDG-51 stern flap or wedge/flap retrofit devices to reduce drag. Monitor ship trials of easy release and ablative copper/cobiocide hull coatings; broaden task to include large-scale tests of reduced copper/cobiocide self-polishing paints. Test and evaluate high efficiency air conditioning plants, supporting both R114 replacement program and development efforts for new construction. Develop shipboard Gas Turbine engine mods which reduce air leakage, improve water wash procedures and reduce exhaust back-pressure to improve efficiency and reduce maintenance costs.
- (U) ($2,464) Facilities: Continue design and T&E of PV/Diesel hybrid power systems for off grid applications. Continue development of high efficiency, low emissions, power generation system. T&E advanced PV module

technologies for grid support and energy efficient/sustainable building designs. Initiate T&E of advanced energy storage concepts for PV systems. Provide all Services with system design and T&E support to implement zero emission, renewable/alternative power systems to address green house gas emission (GHG) reduction. Provide technical support for site-specific technology selection for renewable/alternative power systems as assigned DoD technical lead.

B. (U) PROGRAM CHANGE SUMMARY

	FY 1998	FY 1999	FY 2000
(U) FY 1999 President's Budget:	2,873	5,544	2,592
(U) Appropriated Value:	0	3,544	-
(U) Adjustments from FY 1999 PRESBUDG:	-43	-2,014	2,854
(U) FY 2000 President's Submission:	2,830	3,530	5,446

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1998 decrease reflects Small Business Innovative Research adjustment (-34) and actual execution (-9). The FY99 decrease reflects a Congressional Reduction in appropriation (-2,000), and an adjustment for undistributed reductions (-14).
The FY 2000 increase results from an NWCF adjustment of (+2,938), CIVPERS (+18), Non Pay Inflation (-79) and Working Capital (-23).

FY 2000 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: February 1999

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604710N PROJECT NUMBER: R0371
PROGRAM ELEMENT TITLE: Navy Energy Program (ENG) PROJECT TITLE: Energy Conservation (ENG)

(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 (Ship, Submarine & Logistics Technology)
(U) PE 0602122N (Aircraft Technology)
(U) PE 0602234N (Materials, Electronics and Computer Technology)
(U) PE 0603508N (Surface Ship & Submarine HM&E Advanced Technology)
(U) PE 0603712N (Environmental Quality and Logistics Advanced Technology)
(U) PE 0603721N (Environmental Protection)
(U) PE 0603724N (Navy Energy Program (ADV)

D. (U) SCHEDULE PROFILE: Not applicable.

FY 2000 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: February 1999

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	FY 1998	FY 1999	FY 2000
Engineering Development & Testing	2,830	3,530	5,446

FY 2000 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: February 1999

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604710N PROJECT NUMBER: R0371
PROGRAM ELEMENT TITLE: Navy Energy Program (ENG) PROJECT TITLE: Energy Conservation (ENG)

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

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/Perform Oblig Date	Activity EAC	Project Office EAC	Total FY 1997 & Prior	FY 1998 Budget	FY 1999 Budget	FY 2000 Budget	To Complete	Total Program
Product Development										
NSWCCDD, ANNAPOLIS					42,558	881	1,170	1,908	cont.	cont.
NAWCAD, PATUXENT					32,746	537	720	990	cont.	cont.
NAWCWD, CHINA LAKE					2,239	575	640	858	cont.	cont.
MISCELLANEOUS					31,587	837	1,000	1,690	cont.	cont.

Support and Management: Not Applicable

Test and Evaluation: Not Applicable

GOVERNMENT FURNISHED PROPERTY: Not Applicable

FY 2000 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: February 1999

BUDGET ACTIVITY: 5
PROGRAM ELEMENT: 0604710N
PROGRAM ELEMENT TITLE: Navy Energy Program (ENG)
PROJECT NUMBER: R0371
PROJECT TITLE: Energy Conservation (ENG)

	Total FY 1997 & Prior	FY 1998 Budget	FY 1999 Budget	FY 2000 Budget	FY 2001 Budget	To Complete	Total Program
Subtotal Product Development.	109,130	2,830	3,530	5,446	5,586	cont.	cont.
Subtotal Support and Management	0	0	0	0	0		
Subtotal Test and Evaluation	0	0	0	0	0		
Total Project	109,130	2,830	3,530	5,446	5,586	cont.	cont.

DATE: February 1999

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604721N
PROGRAM ELEMENT TITLE: Battle Group Passive Horizon Extension System

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & Title	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Complete	Total Program
X2134 BGPHES-ST	1,943	1,826	829	718	732	745	762	779	Cont.	Cont.
X2135 CHBDL-ST	2,198	2,186	962	1,538	1,570	1,603	1,639	1,675	Cont.	Cont.
Total	4,141	4,012	1,791	2,256	2,302	2,348	2,401	2,454	Cont.	Cont.

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Battle Group Passive Horizon Extension System - Surface Terminal (BGPHES-ST) extends the Battle Group's line-of-sight radio horizon by using remote receivers in an airborne 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.

DATE: February 1999

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604721N PROJECT NUMBER: X2134
PROGRAM ELEMENT TITLE: Battle Group Passive Horizon Extension System PROJECT TITLE: BGPHES-ST

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & Title	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Complete	Total Program
X2134 BGPHES-ST	1,943	1,826	829	718	732	745	762	779	Cont.	Cont.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: Battle Group Passive Horizon Extension System Surface Terminal (BGPHES-ST) extends the Battle Group's line-of-sight radio horizon via the Common High Bandwidth Data Link Shipboard Terminal (CHBDL-ST). BGPHES-ST will be located in LHD, LHA, CV/CVN, LCC, and AGF Ships Signal Exploitation Space (SSES). The BGPHES-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 downsizes 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 1998 ACCOMPLISHMENTS:

- (U) ($235) Initiate development effort to access EP-3E Joint Signals Avionics Family (JSAF) Low Band Subsystem Sensor (LBSS).
- (U) ($465) Complete USAF U-2S interoperability test with rehosted TAC-N configuration.
- (U) ($464) Complete P^3I development effort to access other ES-3A PME, including special signals.
- (U) ($445) Continue P^3I development effort to access other USAF U-2S PME, including special signals.
- (U) ($295) Complete the development of EPR-157/EPR-208 functional capabilities into existing BGPHES-ST hardware.

- (U) ($ 39) Continue development and update of Naval C^4ISR implementation guidance. Develop and update the Naval C^4ISR mission to incorporate overarching operational systems, technical and information architectures. Conduct associated C^4ISR analyses and studies.

2. (U) FY 1999 PLAN:

- (U) ($1,339) Continue development effort to access upgrade USAF U-2S PME, including special signals.
- (U) ($ 310) Initiate and complete development design engineering of BGPHES-ST on the LCC/AGF class.
- (U) ($ 137) Initiate development effort to rehost software to TAC-(N+1) computer and definition of software enhancements to host ship's C^4I system.
- (U) ($40) Continue P^3I development effort to access EP-3E JSAF LBSS.

3. (U) FY 2000 PLAN:

- (U) ($488) Complete development effort to allow interoperability with USAF upgrade PME.
- (U) ($171) Continue development effort to rehost software and be IT-21 compatible (formerly TAC-N1 development).
- (U) ($170) Complete P3I development efforts to access EP-3E Joint SIGINT Avionics Family (JSAF) Low Band Sub-System (LBSS).

B. (U) PROGRAM CHANGE SUMMARY EXPLANATION:

(U) Funding:

FY 1998: -$ 51K for the Small Business Innovation Research Program. -$24K for the DD1002 April 1998 update, -$21K for the BTR update for June 1998, and -$24K for the FY98 Update.

DATE: February 1999

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604721N PROJECT NUMBER: X2134
PROGRAM ELEMENT TITLE: Battle Group Passive Horizon Extension System PROJECT TITLE: BGPHES-ST

FY 1999: -$684K for C^4I expenditure carryover, -$6K for Revised Economic Assumptions, -$2K for Civilian Personnel Underexecution.

FY 2000: -$130K for C^4I expenditure carryover, $8K for NWCF rates - NCCOSC, $3K for Civilian Pay Rates, and -$12K for Non-Pay Inflation.

(U) Schedule: Not Applicable.

(U) Technical: Not Applicable.

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

	FY 1998	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete	Total Program
OPN Line 2360	0	0	5,339	5,720	3,358	4,148	8,460	10,500	Cont.	Cont.
OPN Line 2434	42,169	65,058	40,083	0	0	0	0	0	Cont.	Cont.
O&M,N 4B7N	1,346	1,320	1,393	1,470	1,346	1,514	1,265	1,293	Cont.	Cont.

(U) RELATED RDT&E: PE 0305885G, Project 05500, BGPHES-ST.

DATE: February 1999

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604721N PROJECT NUMBER: X2134
PROGRAM ELEMENT TITLE: Battle Group Passive Horizon Extension System PROJECT TITLE: BGPHES-ST

D. (U) ACQUISITIONS STRATEGY:

	FY 1998	FY 1999	FY 2000	To Complete
Program Milestones	IOC 2Q	FOT&E/TAC 4	FOT&E/SIGINT	
Engineering Milestones	P^3I Development	P^3I Development	P^3I Development	P^3I Development
T&E Milestones	Interoperability Testing	Interoperability Testing	JSAF Interoperability Testing	JSAF Interoperability Testing
Contract Milestones	Award Prod Contract 1Q			

DATE: February 1999

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 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Complete	Total Program
X2135 CHBDL-ST	2,198	2,186	962	1,538	1,570	1,603	1,639	1,675	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, imagery, second counter-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). Acoustic intelligence data is received from various tactical airborne reconnaissance systems and delivered to the Aircraft Carrier Tactical Support Center.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1998 ACCOMPLISHMENTS:

- (U) ($800) Initiate development of Dual Simultaneous Link Capability.
- (U) ($280) Initiate development efforts for wideband encryption (KG-135) enhancements.
- (U) ($454) 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) ($620) Initiate development efforts for ship-to-ship data connectivity.

- (U) ($ 44) Continue development and update of Naval C^4ISR implementation guidance. Develop and update the Naval C^4ISR mission to incorporate overarching operational systems, technical and information architectures. Conduct associated C^4ISR analyses and studies.

2. (U) FY 1999 PLAN:

- (U) ($100) Test of dual simultaneous link capability.
- (U) ($300) Initiate development efforts for interoperability with other emerging sensor systems.
- (U) ($361) Continue development efforts for ship-to-ship data connectivity.
- (U) ($505) Initiate multi-queing capability development.
- (U) ($500) Complete development of wideband encryption (KG-135) enhancements.
- (U) ($420) Continue Test and Evaluation with other systems such as Joint Services Imagery Processing System (JSIPS) ATARS, GUARDRAIL, U-2 AIP, and HAE UAVs.

3. (U) FY 2000 PLAN:

- (U) ($282) Continue development efforts for interoperability with other emerging sensor systems.
- (U) ($190) Continue development efforts for ship-to-ship data connectivity.
- (U) ($150) Continue multi-queing capability development.
- (U) ($340) Continue Test and Evaluation with other systems such as Joint Services Imagery Processing System (JSIPS) ATARS, GUARDRAIL, U-2 AIP, and HAE UAVs.

DATE: February 1999

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604721N PROJECT NUMBER: X2135
PROGRAM ELEMENT TITLE: Battle Group Passive Horizon Extension System PROJECT TITLE: CHBDL-ST

B. (U) PROGRAM CHANGE SUMMARY EXPLANATION:

(U) Funding:

(U) FY 1998: -$ 45K for the Small Business Innovation Research Program. -$27K for the DD1002 April 98 update -$24K for the BTR June 98 update, and -$25K for the FY98 Update.

FY 1999: -$1,000K for C^4I expenditure carryover, -$58K for Contract Advisory and Assistant Services, -$7K for Revised Economic Assumptions, and -$1K for Civilian Personnel Underexecution.

FY 2000: -$ 575K for C^4I expenditure carryover, $7K for NWCF rates - NCCOSC, $2K for Civilian Pay Rates, and -$14K for Non-Pay Inflation.

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

DATE: February 1999

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604721N PROJECT NUMBER: X2135
PROGRAM ELEMENT TITLE: Battle Group Passive Horizon Extension System PROJECT TITLE: CHBDL-ST

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

	FY 1998 Estimate	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete	Total Program
OPN Line 2434	42,169	65,058	40,083	23,443	19,882	19,444	47,705	47,821	Cont.	Cont.
O&M,N	848	824	1,022	1,134	1,156	1,198	2,823	2,911	Cont.	Cont.

(U) RELATED RDT&E: PE 0603261N Project A2174 Joint Service Imagery Processing Systems - Navy (JSIPS-N).

D. (U) ACQUISITION STRATEGY:

	FY 1998	FY 1999	FY 2000	To Complete
Program Milestones	IOC 2Q			
Engineering Milestones		-Wideband Encryption Interface -Dual Simultaneous Link		-Multi-Queing Capability
T&E Milestones	-Guardrail Interoperability -JSIPS-N DT/OT	-Guardrail/UAV/U-25 AIP Interoperability Tests	-Guardrail U2 Air Interoperability Tests	-Ship to Ship Interoperability Tests -UAV Interoperability Tests

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604721N PROJECT NUMBER: X2135

Exhibit R-3 Cost Analysis (page 1)												Date: February 1999
APPROPRIATION: RDT&E,N BUDGET ACTIVITY : 5			PROGRAM ELEMENT: 0604721N									CHBDL-ST X2135
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date	FY01 Cost	FY01 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	CPFF	Loral-Salt Lake, UT	20,502	0		0				20,502	20,502	20,502
Hardware Development/Integration	Various	Various	2,768	1,666	Mar 99	622	Jan 00			Cont.	Cont.	Cont.
Subtotal Product Development			23,270	1,666		622				Cont.	Cont.	Cont.
Remarks:												
Integrated Logistics Support	Various	Various	254	0		0						
Subtotal Support			254	0		0						
Remarks												

Exhibit R-3 Cost Analysis (page 2)												Date: February 1999
APPROPRIATION: RDT&E,N BUDGET ACTIVITY : 5			PROGRAM ELEMENT: 0604721N									CHBDL-ST X2135
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date	FY01 Cost	FY01 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Developmental/Operational T&E	Various	Various	895	520	Jan 99	340	Jan 00			Cont.	Cont.	Cont.
Subtotal T&E			895	520		340				Cont.	Cont.	Cont.
Remarks												
Project Management	Varous	Various	465									
Subtotal Management			465									
Remarks												
Total Cost			24,884	2,186		962				Cont.	Cont.	Cont.
Remarks												

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EXHIBIT R-2, FY 2000 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604727N
PROGRAM ELEMENT TITLE: Joint Standoff Weapon (JSOW)

(U) COST: (Dollars in Thousands)

Project Number & Title	FY 1998 Budget	FY 1999 Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete	Total Program
E2068/E2436 JSOW	74151*	47346	30567	21133	5712	0	0	0	0	706,060
TOTAL	**74151**	**47346**	**30567**	**21133**	**5712**	**0**	**0**	**0**	**0**	**706,060**
Quantity of RDT&E Articles	**6**	**9**	**8**	**8**	**0**	**0**	**0**	**0**		

*Includes $8,450 Congressional add for the acceleration of the Unitary variant.

(U) A. 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. The JSOW program will first develop a baseline weapon for use against fixed area targets. The JSOW Baseline (AGM-154A) variant includes a kinematically efficient airframe, an integrated Inertial/Global Positioning System (INS/GPS) navigation capability, and a BLU-97/B submunition payload. This weapon is designed up front for pre-planned product improvements. The JSOW AGM-154A was approved for Full Rate Production (FRP) on 13 October 1998. The JSOW Unitary (AGM-154C) variant will add a terminal seeker, Autonomous Target Acquisition (ATA) capability, and a unitary warhead to enable the attack of blast/fragmentation sensitive or moving point targets. The JSOW Unitary will provide increased accuracy and lethality and the capability for aimpoint selection and target discrimination. The Unitary E&MD program includes the completion of development through Operational Evaluation (OPEVAL) completion in FY-02. Following completion of OPEVAL, Low Rate Initial Production (LRIP) is planned in FY-02. The Unitary E&MD program was restructured via a Cost-As-An-Independent-Variable (CAIV) effort resulting in a streamlined E&MD and production program and a significant reduction in the Unitary Average Unit Procurement Price (AUPP). 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. The AGM-154B was approved for LRIP on 13 October 1998. 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.

DATE: February 1999

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604727N** **PROJECT NUMBER: E2068/E2436**
PROGRAM ELEMENT TITLE: Joint Standoff Weapon (JSOW) **PROJECT TITLE: Joint Standoff Weapon (JSOW)**

(U) COST: (Dollars in Thousands)

Project Number & Title	FY 1998 Budget	FY 1999 Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete	Total Program
E2068/E2436 JSOW	74151*	47346	30567	21133	5712	0	0	0	0	706,060
TOTAL	**74151**	**47346**	**30567**	**21133**	**5712**	**0**	**0**	**0**	**0**	**706,060**
Quantity of RDT&E Articles	**6**	**9**	**8**	**8**	**0**	**0**	**0**	**0**		

*Includes $8,450 Congressional add for the acceleration of the Unitary variant.

(U) A. 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. The JSOW program will first develop a baseline weapon for use against fixed area targets. The JSOW Baseline (AGM-154A) variant includes a kinematically efficient airframe, an integrated Inertial/Global Positioning System (INS/GPS) navigation capability, and a BLU-97/B submunition payload. This weapon is designed up front for pre-planned product improvements. The JSOW AGM-154A was approved for Full Rate Production (FRP) on 13 October 1998. The JSOW Unitary (AGM-154C) variant will add a terminal seeker, Autonomous Target Acquisition (ATA) capability, and a unitary warhead to enable the attack of blast/fragmentation sensitive or moving point targets. The JSOW Unitary will provide increased accuracy and lethality and the capability for aimpoint selection and target discrimination. The Unitary E&MD program includes the completion of development through Operational Evaluation (OPEVAL) completion in FY-02. Following completion of OPEVAL, Low Rate Initial Production (LRIP) is planned in FY-02. The Unitary E&MD program was restructured via a Cost-As-An-Independent-Variable (CAIV) effort resulting in a streamlined E&MD and production program and a significant reduction in the Unitary Average Unit Procurement Price (AUPP). 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. The AGM-154B was approved for LRIP on 13 October 1998. 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.

DATE: February 1999

BUDGET ACTIVITY: 5 | **PROGRAM ELEMENT: 0604727N** | **PROGRAM ELEMENT TITLE: Joint Standoff Weapon (JSOW)** | **PROJECT NUMBER: E2068/E2436** | **PROJECT TITLE: Joint Standoff Weapon (JSOW)**

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1998 ACCOMPLISHMENTS:
   - (U) UNITARY:
     - ($56,979) Continue E&MD efforts and begin Cost-as-An-Independent-Variable (CAIV) Studies
     - ($ 7,297) Continue systems engineering technical efforts, Mission Planning System integration, safety approvals,Developmental Test and Evaluation (DT&E) planning
     - ($ 1,646) Continue F/A-18 Integration
   - (U) BLU-108:
     - ($ 2,504) Continue E&MD efforts
     - ($ 5,125) Continue systems engineering technical efforts, Mission Planning System integration, safety approvals
     - ($ 600) Continue Sensor Fuze Weapon Efforts
2. (U) FY 1999 PLAN:
   - (U) UNITARY:
     - ($33,205) Continue E&MD efforts, captive flight testing, and CAIV studies; complete qualification of the Low Cost Guidance Electronics Unit (LCGEU) common to all JSOW variants.
     - ($ 3,720) Continue systems engineering technical efforts, Mission Planning System integration, safety approvals and DT&E planning
     - ($ 1,700) Complete F/A-18 Integration
   - (U) ($ 930) Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15 USC 638
   - (U) BLU-108:
     - ($ 3,765) Complete E&MD contract efforts.
     - ($ 3,376) Continue systems engineering technical efforts, Mission Planning System integration, insensitive munitions qualification, safety approvals and Operational Test & Evaluation (OT&E) planning
     - ($ 650) Complete Sensor Fuze Weapon E&MD efforts; acquire Government Furnished Equipment submunitions for Operational Evaluation (OPEVAL) assets

3. (U) FY 2000 PLAN:
   - (U) UNITARY:
     - ($26,667) Continue E&MD efforts, configuration audits, and environmental testing
     - ($ 2,264) Conduct systems engineering technical efforts, Mission Planning System integration and contractor flight tests
     - ($ 890) Conduct Navy DT&E and begin OT&E planning
   - (U) BLU-108:
     - ($ 746) Complete Navy OPEVAL

DATE: February 1999

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604727N** **PROJECT NUMBER: E2068/E2436**
PROGRAM ELEMENT TITLE: Joint Standoff Weapons (JSOW) **PROJECT TITLE: Joint Standoff Weapons (JSOW)**

(U) B. PROGRAM CHANGE SUMMARY

	FY 1998	FY 1999	FY 2000
(U) FY 1999 President's Budget:	77,977	73,022	52,883
(U) Appropriated Value:	78,244	48,022	
(U) Adjustments from Pres Budget:	-3,826	-25,676	-22,316
(U) FY 2000 DON Budget Submit:	74,151	47,346	30,567

CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY-98 net decrease of $3,826 thousand is due to a reduction of $3,042 thousand for Small Business Innovative Research, a below threshold reprogramming (BTR) of $417 thousand for the Center for Naval Analysis, a BTR of $1,000 thousand for the Joint Air to Surface Standoff Missile (JASSM) program, and miscellaneous net program adjustments totaling +$633 thousand. The FY-99 decrease of $25,676 thousand is due to a Congressional reduction of $25,000 thousand, a revised economic A reduction of $110 thousand, a civilian personnel underexecution reduction of $13 thousand and a contract advisory assistance services reduction of $553 thousand. The FY-00 decrease of $22,316 thousand reflects a restructuring of the Unitary Variant and adjustments for civilian pay rates and non-pay inflation.

(U) (U) Schedule: JSOW Unitary: As a result of the decision to restructure the JSOW Unitary E&MD effort to define a more affordable weapon, Critical Process Reviews #2 and #3 (previously reported as 2Q/FY-99 and 4Q/FY-00) were deleted. JSOW BLU-108: An administrative correction was made to add a BLU-108 OPEVAL period from 2Q-4Q/FY-00 to assess Navy specific shipboard suitability issues.

(U) (U) Technical: JSOW Unitary: The reduced JSOW Unitary E&MD funding profile will enable completion of the E&MD program, including OPEVAL.

DATE: February 1999

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604727N** **PROJECT NUMBER: E2068/E2436**
PROGRAM ELEMENT TITLE: Joint Standoff Weapons (JSOW) **PROJECT TITLE: Joint Standoff Weapons (JSOW)**

(U) C. OTHER PROGRAM FUNDING SUMMARY

Appn	FY 1998 Budget	FY 1999 Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete
USN WP,N; PE: 223000									
$s	76,286	117,021	154,913	180,206	219,253	210,495	186,021	132,210	3,167,981
Qtys	135	328	615	636	748	775	785	584	13,094
USAF WP,F; PE: 27324F*									
$s	20,200	41,700	78,800	97,300	65,900	74,600	128,500	174,200	1,184,100
Qtys	45	96	193	180	170	222	473	561	4,184

Related RDT&E
(U) PE: 0604727F (USAF RDT&E,F)

DATE: February 1999

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 6004727N** **PROJECT NUMBER: E2068/E2436**
PROGRAM ELEMENT TITLE: Joint Standoff Weapon (JSOW) **PROJECT TITLE: Joint Standoff Weapon (JSOW)**

(U) D. ACQUISITION STRATEGY: The contracting strategy for JSOW is planned to be sole source for the life of the program. Cost type contracts were used for the E&MD program effort. Fixed price type contracts will be used during production.

(U) E. SCHEDULE PROFILE

	FY 1998	FY 1999	FY 2000	TO COMPLETE
(U) Program Milestones				
• Baseline		1Q MS-III		
• BLU-108				1Q/FY01 MS-III
• Unitary		2Q OIPT 1Q WIPT 2Q DRM		4Q/FY02 MS-III
(U) Engineering Milestones				
• Baseline				
• BLU-108				
• Unitary				
(U) T&E Milestones				
• Baseline				
• BLU-108	2Q-3Q Combined DT&E/IOT&E*		2Q-4Q OPEVAL	
• Unitary			2Q/00-4Q/00 DT&E/Contractor Free Flight	4Q/FY01-1Q/02 OPEVAL
(U) Contract Milestones				
• Baseline	1Q LRIP Option 3Q LRIP 1st Delvy	1Q FRP Award	1Q FRP Option	1Q/FY01 FRP Option
• BLU-108		1Q LRIP Option	1Q LRIP Option	1Q/FY01 FRP Option
• Unitary		1Q Restructure Contract Mod		1Q/FY02 LRIP

*USAF funded

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT:** 0604727N **PROJECT NUMBER:** E2068/E2436
PROJECT TITLE: Joint Standoff Weapons (JSOW)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	Cost to Complete	Total Cost	Target Value of Contract
DEM/VAL contract	C/CPIF	Raytheon Lewisville TX	22,101	0		0	0	0	22,101	22,101
Pre-MS-I contract	C/CPIF	Raytheon Lewisville TX	3,275	0		0		0	3,275	3,275
Pre-E&MD contract	C/CPIF	Raytheon Lewisville TX	3,143	0		0		0	3,143	3,143
Baseline E&MD contract	C/CPIF	Raytheon Lewisville TX	243,776	0		0		0	243,776	243,776
Unitary pre-E&MD contract	SS/CPIF	Raytheon Lewisville TX	6,316	0		0		0	6,316	6,316
Unitary E&MD contract	SS/CPIF/AF	Raytheon Lewisville TX	123,518	30,666	10/98	26,667	10/99	13,842	194,693	194,693
Unitary E&MD contract award fee[2]	Fee	Raytheon Lewisville TX	4,579	2,539	12/98	0		0	7,118	7,118
BLU-108 pre-E&MD contract	SS/CPIF	Raytheon Lewisville TX	474	0		0		0	474	474
BLU-108 E&MD contract	SS/CPIF	Raytheon Lewisville TX	9,265	3,765	12/98	0		0	13,030	13,030
BLU-108 Smart Rack	SS/CPIF	MTechnology Horsham PA	4,585	0		0		0	4,585	4,585
F/A-18 JSOW Integration	SS/CPIF	McDonnell Douglas St Louis MO	16,024	1,496	11/98	0		0	17,520	17,520
Software Integration IDIQ/TAMPS	SS/CPIF	Raytheon Lewisville TX	1,758	1,109	10/98	0		4,738	7,605	7,605
BLU-108 SFW E&MD	SS/CPIF	Textron	2,273	650	02/99	0		0	2,923	2,923
SFW E&MD contract Award Fee[3]	Award Fee	Textron	80	0		0		0	80	80
Systems Engineering Technical Support	WX-Cost Reimbursement	NAWCWD China Lake CA	99,998	4,120	11/98	1,784	10/99	3,205	109,107	
F/A-18 Integration	WX-Cost Reimbursement	NAWCWD China Lake CA	14,845	204	12/98	0		0	15,049	
Engineering and technical services	SS/Various	various	16,114	1,037	11/98	300	10/99	300	17,751	17,751
Miscellaneous Contracts (<$1M)	SS/Various	Various	6,002	560	02/99	180	10/99	360	7,102	7,102
Subtotal Project Development			**578,126**	**46,146**		**28,931**		**22,445**	**675,648**	
Subtotal Support			**0**	**0**		**0**		**0**	**0**	

Remarks:
Note 1: The Unitary E&MD contract (target value) is being modified to reflect funding available under restructured CAIV program. Note 2: Historical Unitary E&MD Award Fee information (percent awarded): Fee #1: 98.3%, Fee #2: 90.1%, Fee #3: 98.0%, Fee #4: 100% Note 3: No historical information available; this is a one-time award fee.

EXHIBIT R-3, FY 2000 RDT&E,N COST ANALYSIS DATE: Feb 1999

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604727N PROJECT NUMBER: E2068/E2436

PROJECT TITLE: Joint Stand Off Weapons(JSOW)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WX/Cost Reimbursement	NAWCWD China Lake CA	19,115	190	10/98	700	10/99	1,400	21,405	
Operational Test & Evaluation	WX/Cost Reimbursement	NAWCWD China Lake CA	4,061	80		936	10/99	3,000	8,077	
Subtotal Test & Evaluation			**23,176**	**270**		**1,636**		**4,400**	**29,482**	
Remarks:										
Subtotal Management			**0**	**0**		**0**		**0**	**0**	
Remarks:										
SBIR Assessment				**930**						
Total Cost			**601,302**	**47,346**		**30,567**		**26,845**	**706,060**	

Exhibit R-2, RDT&E Budget Item Justification	Date: February 1999
APPROPRIATION/BUDGET ACTIVITY 1319 BA5	R-1 ITEM NOMENCLATURE Ship Self Defense / 0604755N

COST ($ in Millions)	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Total P.E. Cost	151.868	134.841	96.580	56.909	66.771	76.443	70.346	65.544	Continuing	Continuing
SPS Improvement Prog / 20166/U0166/U2438	9.252	2.633	.506	0	0	0	0	0	0	71.205
5" Rolling AirFrame Missile/20167/U0167	13.215	4.213	6.361	3.883	3.458	3.531	3.617	3.709	Continuing	Continuing
NATO SeaSparrow/ U0173/20173	45.375	49.031*	11.012	9.907	11.910	13.617	8.724	5.098	Continuing	Continuing
Shipboard EW Imp / K/094/U0954	2.099	1.768	0	0	0	0	0	0	0	182.066
QRCC / K2178/U2178/U2440/U2437/U2439	43.904	24.768	20.412	15.180	16.746	12.777	13.044	13.310	Continuing	Continuing
NULKA / K2190/U2190	7.687	2.255	1.435	1.094	.561	1.089	1.116	1.142	Continuing	Continuing
NULKA Ship Sets/U2441/K2441	1.886	1.995	0	0	0	0	0	0	0	3.881
AIEWS / K/2309/U2309	24.678	40.715	43.744	18.184	31.341	40.513	41.389	42.285	Continuing	Continuing
IRST/U2649/22649	0	6.485	13.110	8.661	2.755	4.916	2.456	0		38.383
IRST / K2442/U2442	3.772	.978	0	0	0	0	0	0	0	4.750
Quantity of RDT&E Articles & cost	4									

A. 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. 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 time-line 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 a 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 (U2442), 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

Exhibit R-2, RDT&E Budget Item Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY 1319 BA5	R-1 ITEM NOMENCLATURE Ship Self Defense / 0604755N	

project U0954..

(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) and 5" Rolling Airframe Missile (RAM) (U0167). 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. The offboard Active Decoy (NULKA, K2190) is a joint cooperative program between the United States and Australia to develop and engage an active offboard decoy which utilizes a broadbend 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 trajectory.

* Additional funding is reflected in FY 1999 NATO SeaSparrow program (U0173/20173) pending approval of the 1415 reprogramming action. FY1999 1415 reprogramming action is in process to realign $16.671M from ESSM WPN into ESSM RDT&E,N. This action is reflected in PBD 703.

B. Program Change Summary:

	FY 1998	FY 1999	FY 2000
FY 1999 President's Budget:	157.971	148.165	174.513
Appropriated Value	163.270 156.665		
Adjustments to FY 1998 Appropriated Value/ FY 1999 President's Budget			
Various Adjustments	-11.402	-21.824	-77.933
FY 2000 PRES Budget Submit:	151.868	134.841	96.580

Funding:
FY98: Change due to decrease for Congresssional undistributed reductions (-5.299), 1998 update (-1.275), below threshold reprogramming (-1.003), SBIR reductions (-3.821), and minor pricing adjustments (-.004).
FY99: Program adjustments (+16.672), QRCC decrease for JSIMS development (-1.855), realignment of Multifunction Radar to DD21 (-35.491), economic assumptions (-0.361), Contract and Advisory Assistance Services (-0.748) and minor pricing adjustments (-0.041).

Exhibit R-2, RDT&E Budget Item Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY 1319 BA5	R-1 ITEM NOMENCLATURE Ship Self Defense / 0604755N	

FY00: Change due to program adjustments (+11.974), offsets for N86 priority items (-4.835), contingency operations (-10.233), acceleration of maritime force protection (-10.130), reduction to Evolved Seaparrow program (-2.000), transfer of funds from AIEWS (-1.000), re alignment of Multifunction Radar to DD21 program (-61.660), and minor pricing adjustments (-0.049)

Schedule: Not applicable.

Technical: Not applicable.

Exhibit R-2a, RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY **RDT&E/BA5**	Program Element Name & No. SHIP SELF DEFENSE/0604755N	Project Name and Number. 5" ROLLING AIRFRAME MISSILE/20167/U0167

Cost ($ in Millions)	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Project Cost	13.215	4.213	6.361	3.883	3.458	3.531	3.617	3.709	Continuing	Continuing
RDT&E Articles Qty										

A. 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 other threats to provide for ship survivability with accurate terminal guidance, proven lethality, and no shipboard post launch dependence.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1998 ACCOMPLISHMENTS:

- (U) ($6.513) Conducted DT/OT-IIB.
- (U) ($1.700) Conducted Tech Eval (DT-IIC).
- (U) ($1.900) Conducted OPEVAL (OT-IIC).
- (U) ($1.200) Conducted contractor and government simulation efforts.
- (U) ($.800) Documentation/evaluation of test results.
- (U) ($1.102) Continued to support development of system interface adaptations as necessary to provide effective SSD integration.

2. (U) FY 1999 PLAN:

- (U) ($3.936) Continue Tech Eval (DT-IIC)/OPEVAL (OT-IIC).
- (U) ($.197) Develop Helo, Air, Surface (HAS) Missile Algorithms, conduct Captive Carry and Simulation Efforts.
- (U) ($.080) Portion of extramural program is reserved for Small Business Innovative Research Assessment in accordance with 15 USC 638.

3. (U) FY 2000 PLAN:

- (U) ($5.082) Refine HAS Missile Algorithms and continue Simulation Efforts and Engineering Tests.
- (U) ($.207) Upgrade the existing RAM/External Designation System Interface for AEGIS.
- (U) ($1.072) Conduct Block 1 OT-IIIA FOT&E

Exhibit R-2a, RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY **RDT&E/BA5**	Program Element Name & No. SHIP SELF DEFENSE/0604755N	Project Name and Number. 5" ROLLING AIRFRAME MISSILE/20167/U0167

B. Other Program Funding Summary

	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Complete	Total Cost
OPN LINE 523800 (RAM)	66.249	59.485	39.295	42.980	36.063	27.998	39.355	69.912	CONT	CONT.
WPN LINE 224200 (RAM)	40.999	44.618	45.429	44.170	82.918	91.773	88.966	85.306	CONT.	CONT.

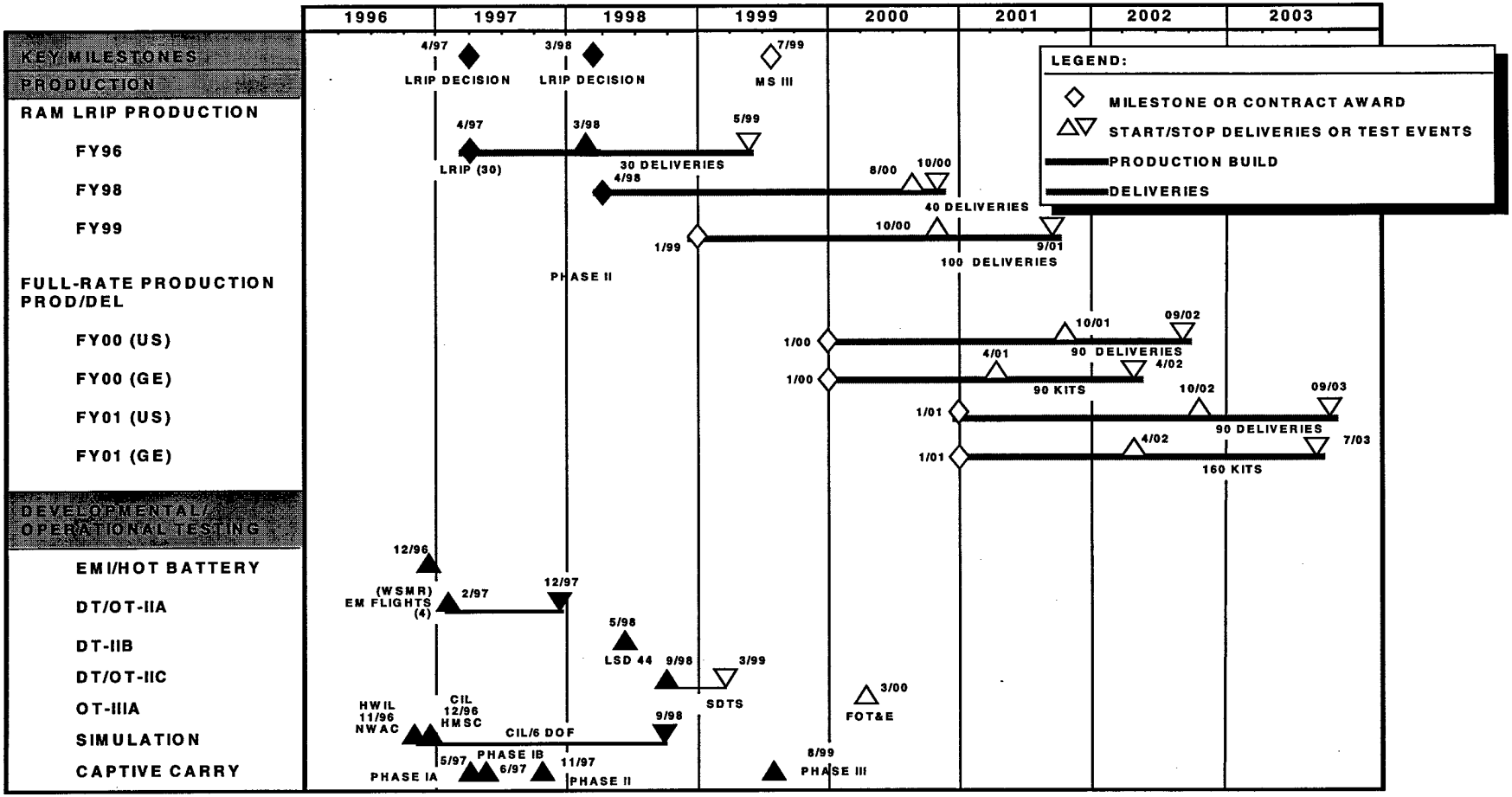
Related RDT&E: Not Applicable.

C. Acquisition Strategy: Introduced Helo/Aircraft/Surface (HAS) Mode ECP, development in FY 1998/1999, and integration in FY 2000.

D. Schedule Profile: See attached.

Exhibit R-2a, RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY **RDT&E/BA5**	Program Element Name & No. SHIP SELF DEFENSE/0604755N	Project Name and Number. 5" ROLLING AIRFRAME MISSILE/20167/U0167

RAM PROGRAM PLAN
BLOCK I DEVELOPMENT/PRODUCTION (CY)



R-1 Item No 125 - 6 of 125 - 33

Exhibit R-2a RDT&E Project Justification
(Exhibit R-2a, Page 6 of 33)

Exhibit R-3 Cost Analysis		February 1999
APPROPRIATION/BUDGET ACTIVITY **RDT&E/BA5**	PROGRAM ELEMENT NAME AND NUMBER SHIP SELF DEFENSE/0604755N	PROJECT NAME AND NUMBER 5" ROLLING AIRFRAME MISSILE/20167/U0167

Cost Categories PRODUCT DEVELOPMENT	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date			Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	SS/CPFF	RMSC, Tucson, AZ	58.891	.397	2/99	1.664	11/99			Continuing	CONT.	CONT.
Ancillary Hardware Development	SS/CPFF	JHU/APL, Laurel, MD	4.888	.623	11/98	.450	11/99			Continuing	CONT.	CONT.
Miscellaneous	Various	Various	227.570	1.185	11/98	.905	11/99			Continuing	CONT.	CONT.
Subtotal Product Development			291.349	2.205		3.019				Continuing	CONT.	CONT.
Remarks: Primary Hardware Development transitions into Test & Evaluation.												
Development Support Equipment												
Software Development												
Training Development												
Integrated Logistics Support												
Configuration Management												
Technical Data												
Subtotal Support			0	0		0				0	0	
Remarks: N/A												

Exhibit R-3 Cost Analysis		February 1999
APPROPRIATION/BUDGET ACTIVITY **RDT&E/BA5**	PROGRAM ELEMENT NAME AND NUMBER SHIP SELF DEFENSE/0604755N	PROJECT NAME AND NUMBER 5" ROLLING AIRFRAME MISSILE/20167/U0167

Cost Categories TEST AND EVALUATION	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date			Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	SS/CPAF	RMSC, Tucson, AZ	1.056	.400	2/99	1.887	11/99			Continuing	CONT.	CONT.
Developmental Test & Evaluation		NAWC, China Lake, CA NSWC, PHD Pt Hueneme, CA	0 5.000	.350	11/98	1.212	10/99			N/A N/A	N/A N/A	N/A N/A
Operational Test & Evaluation	SS/CPAF	RMSC, Tucson, AZ	5.570	.200	2/99	0				Continuing	CONT.	CONT.
Operational Test & Evaluation		NSWC, PHD Pt Hueneme, CA	0	.990	2/99	0				N/A	N/A	N/A
Miscellaneous		Various	5.003	.050	1/99	.138	10/99			Continuing	CONT.	CONT.
Subtotal T&E			16.629	1.990		3.237				Continuing	CONT.	CONT.
Remarks:												
Cost Categories MANAGEMENT												
Miscellaneous	Various	Various	3.124	.018	1/99	.105	11/99			Continuing	CONT.	CONT.
Subtotal Management			3.124	.018		.105				Continuing	CONT.	CONT.
Remarks:												
Total Cost			311.102	4.213		6.361				Continuing	CONT.	CONT.
Remarks:												

Exhibit R-2a, RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E BA-5	Program Element Name & No. SHIP SELF DEFENSE 0604755N	Project Name and Number. NATO SEASPARROW 20173/U0173

Cost ($ in Millions)	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Project Cost	45.375	49.031*	11.012	9.907	11.910	13.617	8.724	5.098	CONT.	CONT.
RDT&E Articles Qty										

Mission Description and Budget Item Justification This program element 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; modifications to the MK41 VLS to fire from a single cell with 4 ESSM (QuadPack); and modifications to NATO SeaSparrow Surface Missile System (NSSMS) to provide ESSM capability.
2. **(U) NATO SEASPARROW – MK91 Rearchitecture/SDSMS**: The MK91 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) SELF-DEFENSE LAUNCHER SYSTEM (SDLS)**. FY03 introduces the SDLS to provide designated ships, not having a VLS, with an affordable, lightweight, means of employing the ESSM. The operational requirement responds to the mission areas of Naval Warfare (230), Counter-Air (221), and Anti-Air Warfare (231). The general mission of ships employing the ESSM is to both provide independent forward presence and to operate as an integral part of joint and allied maritime forces. The mission is to achieve a level of force protection by employing a nearly "puncture proof" ship defense capability against all varieties of threats envisioned in a littoral environment. The SDLS will leverage existing technology and current development efforts including the MK25 ESSM QuadPack canister Commercial-Off-The-Shelf/Non-Development Items (COTS/NDI) electronics and SSDS. The system will be applicable to multiple ship classes and will use the Navy support structure either in place or planned for the ESSM and MK25 QuadPack canister. Use of COTS/NDI components and equipment will be maximized.

* **(U) ESSM FY 99 Above Threshold Reprogramming (ATR) Action:** Problems identified in Auto-pilot software and OPEVAL support schedule have delayed US LRIP and OPEVAL by one year and will require additional RDTEN funding to address. The additional funding is reflected in these controls, pending approval of the 1415 reprogramming action. FY 1999 1415 reprogramming action is in process to realign $16.672M from ESSM WPN into ESSM RDT&E,N. This action is reflected in PBD 703.

FY 1998 ACCOMPLISHMENTS:

ESSM ($38.280)

- ($18.0) Incremental funding continued EMD efforts at Raytheon, including the S-Band capability for AEGIS/ESSM uplink. Continued DT-IIA testing, and delivered production representative missiles to support at sea development test and operational assessment (DT-IIA/OT-IIA) .
- ($.685) Incremental funding for continuation of warhead development. Continued live fire threat/vulnerability testing.
- ($11.5) Continued MK41 VLS ESSM QuadPack development effort at United Defense, Lockheed Martin and government labs. Conducted land based firings and testing associated with launcher environment.
- ($8.095) Continued integrated product team efforts and government lab/engineering efforts associated with EMD. Conducted DT-IIA/OT-IIA for ESSM.

Exhibit R-2a, RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E BA-5	Program Element Name & No. SHIP SELF DEFENSE 0604755N	Project Name and Number. NATO SEASPARROW 20173/U0173

NATO SEASPARROW (7.095)

- ($5.655) Completed effort on EMD contract with Raytheon to modify NSSMS MK91 with SSDS Architecture. Completed formal software qualification testing in Mar 98. Commenced Self-Defense Test Ship (SDTS) installation of hardware in Jan –May 1998.
  ($1.440) Modified computer programs to address deficiencies identified in installation of MK 91 Rearchitecture hardware on the SDTS. Continued efforts associated with support of SSDS configuration.

FY 1999 PLAN

ESSM ($29.920):

- ($17.259) Incremental funding to continue EMD efforts at Raytheon, including the S-Band capability for AEGIS/ESSM uplinks. Continue DT-IIA/OT-IIA at WSMR.
- ($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.
- ($6.201) Continue ESSM integrated product team participation and government lab engineering efforts associated with EMD. Support development and operational tests.

ESSM U.S. Share of Cost Growth ($16.672) :

- Above Threshold Reprogramming is required to fund the U.S. share of the ESSM cost growth associated with the autopilot redesign and the program schedule. Source of funding is WP,N BA-2 Other Missiles, Evolved Seasparrow Missile, #230700.

NATO SEASPARROW ($1.750)

- Complete MK91 software installation in Self Defense Test Ship in December 1998. Support testing of the MK91 Rearchitecture with RIM 7P baseline and RIM-7P++ firing (Jan-May99).

SBIR ($.689) Portion of extramural program is reserved for Small Business Innovation Research assessment in accordance with 15 USC 638.

FY 2000 PLAN:

ESSM ($8.772)

- ($6.190) Continue EMD efforts at Raytheon, including the S Band capability for AEGIS/ESSM uplink. Conduct DT-IIC/OT-IIC on the Self Defense Test Ship (SDTS) (Oct 99-Mar 00). Conduct ESSM Aegis DT-IIB/OT-IIB at WSMR.
- ($2.582) MK41 QuadPack. Conduct formal testing including: Weapons control system/VLS integration with AEGIS at White Sands Missile Range; and conduct LCS Regression Test and Barge Shock Test.

NATO SEASPARROW ($2.240):

- ($2.240) Complete computer programs/integration of the MK91 rearchitecture on CVN/LHD Class ships. Support DT-IIC/OT-IIC on SDTS with ESSM. Address any deficiencies identified as a result of testing of the MK91 Rearchitecture with RIM 7P baseline and ESSM.

Exhibit R-2a, RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E BA-5	Program Element Name & No. SHIP SELF DEFENSE 0604755N	Project Name and Number. NATO SEASPARROW 20173/U0173

B. Other Program Funding Summary

	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	TO Complete	TOTAL Cost
1. WPN BA-2 Other Missiles, Sparrow Mods (230400/Evolved SeaSparrow Missile (ESSM) (230700)	10.255	12.882*	11.668	34.452	60.613	95.993	84.453	89.938	Con't	Con't
2. OPN BA-4 NATO SEASPARROW (523700, 523705)	12.385	7.304	.492	17.726	49.794	44.728	60.346	29.387	Con't	Con't

3. Related RDT&E:
   - PE 0603609N (Conventional Munitions)
   - PE 0604307N (AEGIS Combat System Engineering)
   - PE 0604755N (U2178 Quick Reaction Combat Capability (QRCC))

* Reflects planned ATR to RDT&E $16.672M.

C. Acquisition Strategy: ESSM is a directed sole source contract to Raytheon Missile Systems Company for LRIP, and upon successful completion of TECHEVAL/OPEVAL in FY02, entering into Full Rate Production. Multi-year full rate production contracting is the preferred approach for the NATO SeaSparrow Consortium.

Exhibit R-2a, RDT&E Project Justification			Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E BA-5	Program Element Name & No. SHIP SELF DEFENSE 0604755N	Project Name and Number. NATO SEASPARROW 20173/U0173	

D. Schedule Profile: As a result of the performance problem identified for the autopilot, the software requires a rewrite with a potential for hardware changes. Additionally, the autopilot effort requires a schedule extension which is reflected below;

	FY 1997	FY 1998	FY 1999	FY 2000
ESSM Milestones:				
Program:				2Q LRIP PMR
Engineering:	4Q CDR			
T&E:	3Q DT/OT-IIA			2Q DT/OT-IIB 2Q DT/OT-IIC
Contract				2Q LRIP CA
Contracts:	2Q DEV CA			

Exhibit R-3 Cost Analysis (Page 2)		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E BA-5	Program Element Name & No. SHIP SELF DEFENSE 0604755N	Project Name and Number. NATO SEASPARROW U0173

Cost Categories	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date			Cost To Complete	Total Cost	Target Value of Contract
ESSM	LC/CPAF	HUGHES	87.379	34.634*	OCT-98	4.897	OCT-99			3.862	130.772*	130.083*
PRIMARY HARDWARE DEV	LC/CPAF	RAYTHEON	3.737	-						-	3.737	3.737
	LC/CPAF	TDW	3.746	-						-	3.746	3.746
ANCILLARY HDWE DEV	CPAF	LOCKHEED/UDLP	37.258	6.354	NOV-98	1.422	NOV-99			.378 -	45.412	Multi-customer contract
SYSTEM ENGR		VARIOUS	17.419	1.730	OCT-98	.600	OCT-99			-	19.749	
NATO (MK 91/SDSMS)												
PRIMARY HARDWARE DEV	CPAF	RAYTHEON HUGHES	24.227 3.638	1.750	NOV-98	1.850	NOV-99			CONT	CONT	
SOFTWARE DEV	CPFF	TRACOR	2.346	-						CONT	CONT	
SYSTEM ENGR	WR	VARIOUS	3.857			.390	NOV-99			CONT	CONT	
SUBTOTAL PRODUCT DEV			183.607	44.468		9.159				CONT	CONT	
Remarks: * Includes planned 1415 reprogramming intended to realign $16.672M from ESSM WPN (LI 230700N) to correct deficiencies recently identified in testing.												
ESSM												
ILS	WR	NSWC PHD	2.618	.478	OCT-98	.304	OCT-99				3.400	
ENGR SPT	WR	VARIOUS	2.297	1.038	OCT-98	.111	OCT-99				3.446	
NATO												
ENGR SPT		VARIOUS	4.824								4.824	

SUBTOTAL SUPPORT			9.739	1.516		.415					11.670	-
Remarks:												

Exhibit R-3 Cost Analysis (Page 2)		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E BA-5	Program Element Name & No. SHIP SELF DEFENSE 0604755N	Project Name and Number. NATO SEASPARROW U0173

Cost Categories	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date			Cost To Complete	Total Cost	Target Value of Contract
ESSM												
DT&E	WR	NAWC CL	2.421	.566	OCT-98	.200	OCT-99			1.000	4.187	
	WR	NAWC WS	2.781	.566	OCT-98	-				.500	3.847	
	WR	VARIOUS		.741	OCT-98	.307	OCT-99			.577	1.625	
SUBTOTAL T&E			5.202	1.873		.507				2.077	9.659	
Remarks:												
ESSM												
ENGR SPT		VARIOUS	3.568	. 322	OCT-98	.084					3.974	
PM SPT	VARIOUS	VARIOUS	. 471	.028	OCT-98	.030	OCT-99			-	.529	
PM PERSONNEL	PD/WR		1.785	.600	VARIOUS	.602	VARIOUS			.700	3.687	
TRAVEL	PD/WR	VARIOUS	.590	.224	VARIOUS	.215	VARIOUS			.209	1.238	
MISC	VARIOUS	VARIOUS	1.450							.200	1.650	
NATO												
TRAVEL			.199							Cont.	Cont.	
MISC			1.084	-								
SUBTOTAL MANAGEMENT			9.147	1.174		. 931				CONT.	CONT	-
Remarks:												
U0173 TOTAL			207.695	49.031*		11.012				CONT	CONT	-

* Includes reprogramming of $16.672 and SBIR reserve of $.689.

Exhibit R-2a, RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E / 5	Program Element Name & No. Ship Self Defense / 0604755N	Project Name and Number. Quick Reaction Combat Capability /K2178/U2178/U2440/U2437/U2439

Cost ($ in Millions)	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Project Cost	43.904	24.768	20.412	15.180	16.746	12.777	13.044	13.310	Continuing	Continuing
RDT&E Articles Qty										

A. Mission Description ad 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 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-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 critical experiments, the Rapid Anti-Ship Missile Integrated Defense Systems (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 Systems (CIWS), and Electronic Countermeasures Systems (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 (NSSM), 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.

Exhibit R-2a, RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E / 5	Program Element Name & No. Ship Self Defense / 0604755N	Project Name and Number. Quick Reaction Combat Capability /K2178/U2178/U2440/U2437/U2439

FY 1998 Accomplishments

- ($14.331) Prepared critical item development specifications and interface control drawings, conducted logistics support analysis, and commenced software coding of SSDS MK 1 for follow-on class ships. (CV(N), LPD-17, LHD, and LHA)
- ($1.325) Prepared updated documentation for SSDS integration with RAM BLK 1.
- ($9.387) Conducted FOT&E on Self Defense Test Ship (SDTS) in conjunction with RAM BLK 1 testing.
- ($3.772) Established Wallops Island Systems Engineering Test Facility for SSDS MK 1.
- ($9.431) Integrated QRCC with NSSM (NATO Sea Sparrow Missile)
- ($5.658) Integrated QRCC with Ship Self Defense Test Ship.

2. FY 1999 Plan:

- ($13.740) Continue software coding for LPD-17 and CV(N) ship classes and prepare for software unit testing.
- ($ 5.205) Integrate hardware and software for LPD-17 and CV(N) ship classes and completion specifications and interface control drawings.
- ($ 5.179) Continue to conduct further FOT&E on Self Defense Test Ship (SDTS) in conjunction with RAM BLK1 testing.
- ($ .644) Portion of extramural program is reserved for Small Business Innovation Research Assessment in accordance with 15 USC 638.

3. FY 2000 Plan:

- ($ 7.286) Conduct Integration Test at Wallops on SSDS MK2.
- ($11.351) Correct software and hardware deficiencies found during Wallops testing.
- ($ .650) Support National test Network (NTN) testing for LPD's.
- ($ 1.125) Integrate logistic support (ILS) planning and documentation updates for SSDS MK2 delivery.

Exhibit R-2a, RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E / 5	Program Element Name & No. Ship Self Defense / 0604755N	Project Name and Number. Quick Reaction Combat Capability /K2178/U2178/U2440/U2437/U2439

B. Other Program Funding Summary

	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Complete	Total Cost
OPN (MK1) 523900, 523905,523906	18.540	38.783	38.790	15.028	26.933	69.143	58.000	42.302	Continuing	Continuing
O&MN 14D90 WPN Maint. QRCC	5.278	7.526	11.967	10.169	10.303	10.285	10.612	10.815	Continuing	Continuing
SCN CV(N) ship class SSDS MK 1	0	42.000	0	0	0	0	0	0	0	42.000
SCN LPD-17 ship classes SSDS MK 1	0	20.200	42.000	43.600	44.800	46.600	0	0	0	245.700

Related RDT&E: PE 0603755N (Ship Self Defense)
PE 0604518N (Advanced Combat Direction System Block 1)
PE 0604755N (Cooperative Engagement Capability)

C. Acquisition Strategy: Two SSDS systems will be procured with OP,N for LSD class ships in FY 99. LSD class procurement will be completed in FY 00 with the procurement of three systems. All systems will be procured under Firm Fixed Price contract. Two of the FY00 procurements will be installed in FY01 and the final unit will be installed in FY02. The FY02 unit will be procured in FY00 to achieve an improved unit price for all three systems through a larger quantity procurement. The SSDS system will continue to undergo development and will be integrated with Advanced Combat Direction System (ACDS) and Cooperative Engagement Capability (CEC). The first integrated SSDS system procurements will take place under a Cost Fixed Fee contract in FY99 and FY00 for the CVN 76, LPD 17 and CVN 68. Follow-on procurements for additional ships of the CV(N), LPD, LHD, and LHA classes will be made using FFP contracts.

Exhibit R-2a, RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E / 5	Program Element Name & No. Ship Self Defense / 0604755N	Project Name and Number. Quick Reaction Combat Capability /K2178/U2178/U2440/U2437/U2439

D. Schedule Profile:

SSDS PROGRAM STRUCTURE

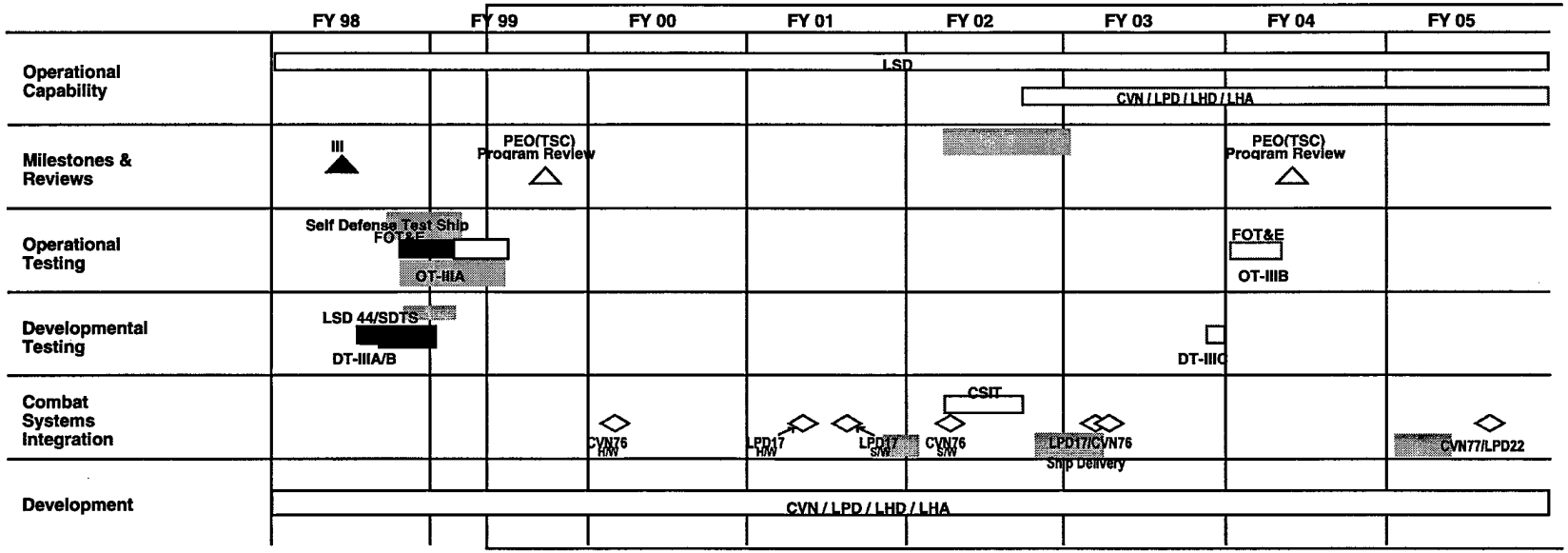


Exhibit R-3 Cost Analysis		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E / 5	PROGRAM ELEMENT NAME AND NUMBER Ship Self Defense / 0604755N	PROJECT NAME AND NUMBER Quick Reaction Combat Capability / K2178/U2178

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date			Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	WR	NSWC-DD Dahlgren, VA	13.597	.554	N/A	.750	N/A			Continuing	Cont.	N/A
Systems Engineering	SS/FP	JHU/APL Laurel, MD	21.291	1.300	N/A	2.500	N/A			Continuing	Cont.	N/A
Systems Engineering	WR	NSWC-PHD Port Hueneme, CA	4.696		N/A		N/A			Continuing	Cont.	N/A
Product Development	SS/CPAF	Raytheon (TBD) San Diego, CA	0	0	0	11.536	TBD			TBD	TBD	TBD
Systems Engineering	SS/CPAF	Raytheon (5466) San Diego, CA	0	4.416	10/98	0	N/A			Continuing	Cont.	44.325
Product Development	SS/CPAF	Raytheon (5466) San Diego, CA	9.800	10.358	10/98	0	N/A			Continuing	Cont.	44.325
Systems Engineering	SS/CPAF	Raytheon (5400) San Diego, CA	7.000	0	N/A	0	N/A			0	7.000	7.000
Software Development	SS/CPAF	Raytheon (5407) San Diego, CA	39.664	0	N/A	0	N/A			0	39.664	39.664
Award Fees	SS/CPAF	Raytheon (5466) San Diego, CA	1.249	2.562	10/98	1.971	10/99			Continuing	Cont.	7.489
Miscellaneous	Various		29.702	.868	N/A	.500	N/A			Continuing	Cont.	
Subtotal Product Development	Various	Miscellaneous	126.999	20.058	N/A	17.257	N/A			Continuing	Cont.	

Remarks:
FY98 / 99: Raytheon contract (5466) was awarded as a CPAF/CPFF contract. Cost variance is due to various appropriated funds that are accepted on this contract.
FY00 / 01: New contract award for Raytheon is TBD for FY00 / 01.

Exhibit R-3 Cost Analysis		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E / 5	PROGRAM ELEMENT NAME AND NUMBER Ship Self Defense / 0604755N	PROJECT NAME AND NUMBER Quick Reaction Combat Capability / K2178/U2178

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	Fy00 Cost	FY00 Award Date			Cost To Complete	Total Cost	Target Value of Contract
Development Support Equipment												
Software Development												
Training Development												
Integrated Logistics Support												
Configuration Management												
Miscellaneous	Various		7.845	.340	N/A	.250	N/A			Continuing	Cont.	N/A
Subtotal Support			7.845	.340	N/A	.250	N/A			Continuing	Cont.	N/A
Remarks:												
Developmental Test & Evaluation	WR	NSWC-PHD Port Hueneme, CA	8.876		N/A		N/A			Continuing	Cont.	N/A
Developmental Test & Evaluation	Various	Wallops Island Dahlgren, VA		2.000	N/A	2.000	N/A			Continuing	Cont.	N/A
Miscellaneous	Various		16.909	1.515	N/A	.050	N/A			Continuing	Cont.	N/A
Subtotal T&E			25.785	3.515	N/A	2.050	N/A			Continuing	Cont.	N/A
Remarks:												
Contractor Engineering Support												
Government Engineering Support												
Program Management Support												
Program Management Personnel												
Travel												
Labor (Research Personnel)												
Miscellaneous	Various		3.927	.855	N/A	.855	N/A			Continuing	Cont.	N/A
Subtotal Management			3.927	.855	N/A	.855	N/A			Continuing	Cont.	N/A
Remarks:												
Total Cost			164.556	24.768	N/A	20.412	N/A			Continuing	Cont.	N/A
Remarks:												

Exhibit R-2a, RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY	Program Element Name & No.	Project Name and Number.
RDT&E/BA-5	Ship Self Defense/0604755N	NULKA Decoy/K2190/U2190/K2441

Cost ($ in Millions)	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
NULKA Decoy	9.573	4.250	1.435	1.094	.561	1.089	1.116	1.142	CONT.	CONT.
RDT&E Articles Qty										

A. 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 ship-like trajectory. The United States developed the Electronic Payload and Fire Control System. Currently the United States is completing efforts to integrate with SSDS, continuing with efforts to maintain Electromagnetic Compatibility (ECM) with shipboard emitters, and continuing AIEWS integration efforts. 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.

Program Accomplishments and Plans:

1. FY 1998 Accomplishments:
- ($9.573) Completed SSDS integration. Conducted DT/OT testing required to achieve a Milestone III decision for the NULKA System. Continued development of payload improvements and EMC upgrade

2. FY 1999 Plan:
- ($2.237) Start AIEWS integration efforts.
- ($1.995) Complete EMC upgrade and conduct testing of EMC improvements.
- ($ .018) Portion of extramural program is reserved for Small Business Innovation Research assessment in accordance with 15 USC 638.

3. FY 2000 Plan:
- ($1.435) Continue AIEWS integration.

A. Other Program Funding Summary

OPN Line 553000

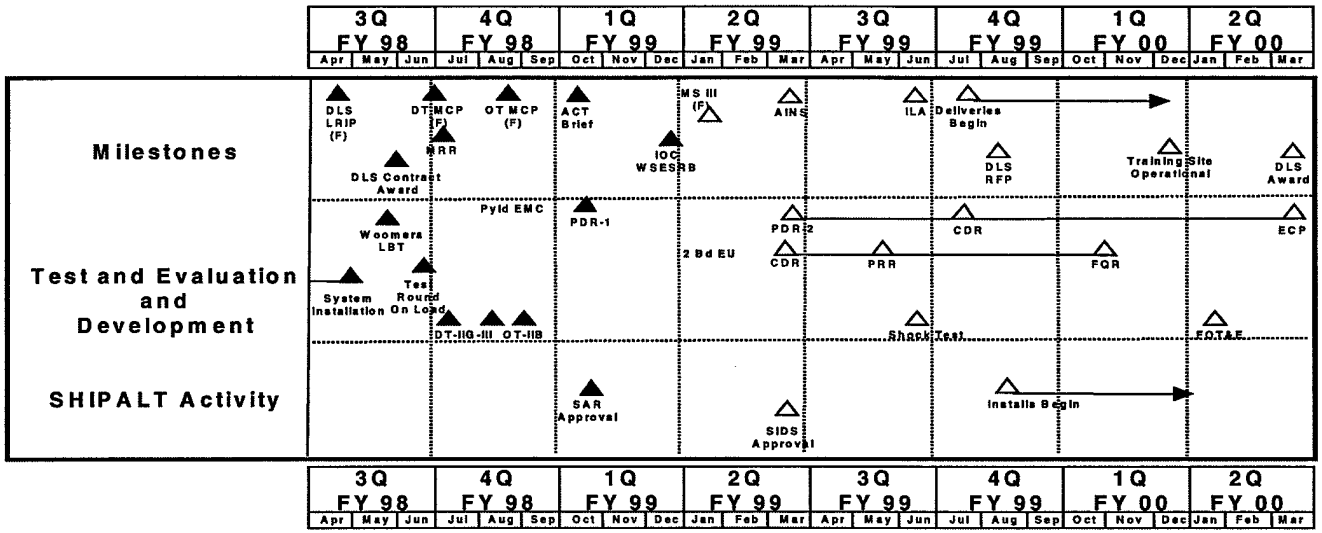
	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Complete	Total Cost
Anti-Ship Missile Decoy System	16.370	22.043	20.446	19.617	17.968	17.714	18.122	19.154	CONT.	CONT.

Acquisition Strategy: Not Applicable

Exhibit R-2a, RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY	Program Element Name & No.	Project Name and Number.
RDT&E/BA-5	Ship Self Defense/0604755N	NULKA Decoy/K2190/U2190/K2441

D. Schedule Profile:

NULKA/MK 53 DLS
TRANSITION TO PRODUCTION



12 Jan 99

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Exhibit R-2a Project Cost Analysis
(Exhibit R-3, Page 22 of 33)

Exhibit R-3 Cost Analysis		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E/BA-5	PROGRAM ELEMENT NAME AND NUMBER Ship Self Defense/0604755N	PROJECT NAME AND NUMBER NULKA Decoy/K2190/U2190/K2441

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total Pys Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date			Cost To Complete	Total Cost	Target Value of Contract
Product Development	WR	NSWC Crane, IN	1.784	.376	10/98	.510	10/99			CONT.	CONT.	N/A
	WR	NSWC Indian Head, MD	1.897	.150	10/98					0	2.047	N/A
	WR	NSWC Dahlgren, VA	4.091	.632	10/98	.526	10/99			CONT.	CONT.	N/A
	WR	NSWC Port Hueneme, CA	.617	.291	10/98					0	. 908	N/A
	WR	NRL Washington, DC	1.780	.320	10/98					0	2.100	N/A
	SS/CPFF	Sippican Boston, MA	3.492	.100						0	3.592	3.592
	SS/CPFF	BAeA, Australia	3.740	1.700						0	5.440	5.440
	PD	NAVSUP Washington, DC	2.400	0						0	2.400	N/A
Subtotal Product Development			19.801	3.569		1.036				CONT.	CONT.	
Remarks:												
Support and Management	CC/CPFF	Techmatics Arlington, VA	.806	.195	11/98	.195	11/99			CONT.	CONT.	CONT.
Travel/Miscellaneous	Various	Various	1.860	.464	10/98	.204	10/98			CONT.	CONT.	CONT.
Subtotal			2.666	.659		.399				CONT.	CONT.	CONT.
Remarks:												
Test & Evaluation	WR	OPTEVFOR	.150	0						0	.150	N/A
	WR	NSWC Pt Mugu, CA	.545	.022						0	.567	N/A
Subtotal T&E			.695	.022						0	.717	N/A
Remarks:												
Total Cost			23.162	4.250		1.435				CONT.	CONT.	CONT.
Remarks:												

Exhibit R-2a, RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E,N/5	Program Element Name & No. Ship Self Defense / 0604755N	Project Name and Number. Advanced Integrated Electronic Warfare System (AIEWS)/U2309

Cost ($ in Millions)	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Project Cost	24.678	40.715	43.744	18.184	31.341	40.513	41.389	42.285	Continuing	Continuing
RDT&E Articles Qty	4									

A. 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 Ship Self Defense System (SSDS)). AIEWS will be developed using a two increment 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. The EMD prime contract includes 4 EDMs to be used for multiple purposes: factory qualification tests, Landbased testing and at-sea Operational Assessment (OA), Wallops Island B/L 7 & 6 & SSDS development testing, Combat System Engineering Development System (CSEDS) testing and DT/OT.

Program Accomplishments and Plans:

FY1998 ACCOMPLISHMENTS:

- (15.270) Awarded AIEWS Increment 1 EMD prime contract to include receiver, SEI, precision ESM, logistics, and integration effort for both AEGIS and ISDS Combat Systems; implementation of risk reduction efforts and advanced technology demonstrations; Lab/Field Activity support included.
- (7.500) Awarded Control and Processing (CAP) software development contract.
- (1.140) Funded share of AEGIS forward fit integration development for AIEWS.
- (.768) Initiated development of Increment 1 logistics efforts to include electronic technical documentation, embedded training foundation, and performed manpower personnel and training analysis.

FY1999 PLAN:

- (30.273) Continue AIEWS Increment 1 EMD prime contract; conduct PDR and most of incremental CDR; Lab/Field Activity support included.
- (8.332) Continue CAP software development.
- (.625) Continue development of Increment 1 logistics efforts.
- (.550) Initiate electronic attack trade study to optimize and ensure compatibility of onboard (RF/IR) countermeasures with offboard (RF/IR) countermeasures for Increment 2.
- (.935) Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15 USC 638.

Exhibit R-2a, RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E,N/5	Program Element Name & No. Ship Self Defense / 0604755N	Project Name and Number. Advanced Integrated Electronic Warfare System (AIEWS)/U2309

FY2000 PLAN:

- (33.471) Continue AIEWS Increment 1 EMD prime contract; Complete CDR; Lab/Field Activity support included
- (8.118) Continue CAP software development.
- (.455) Continue development of Increment 1 logistics efforts.
- (.600) Begin establishment of resources and initiate efforts for accomplishing T&E.
- (1.100) Continue/complete Increment 2 electronic attack trade study.

B. Other Program Funding Summary

	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	To FY 2005	Total Complete	Cost
OPN 231300 AIEWS	0	0	0	0	32.879	35.015	53.789	77.976	CONT	CONT

C. Acquisition Strategy: The AIEWS program awarded its Increment 1 EMD Cost Plus Award Fee (CPAF) contract based on best value as a result of a full and open competition. Included in the contract were phased price options for Increment 1 LRIP and production. Other options include Increment 2 EMD and LRIP for RF and IR countermeasures. Options for full contractor support including Direct Vendor Delivery (DVD), Software Support Activity (SSA) and engineering services are also part of the contract.

D. Schedule Profile: See attached schedule.

Exhibit R-2a, RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E,N/5	Program Element Name & No. Ship Self Defense / 0604755N	Project Name and Number. Advanced Integrated Electronic Warfare System (AIEWS)/U2309

AIEWS
PROGRAM STRUCTURE

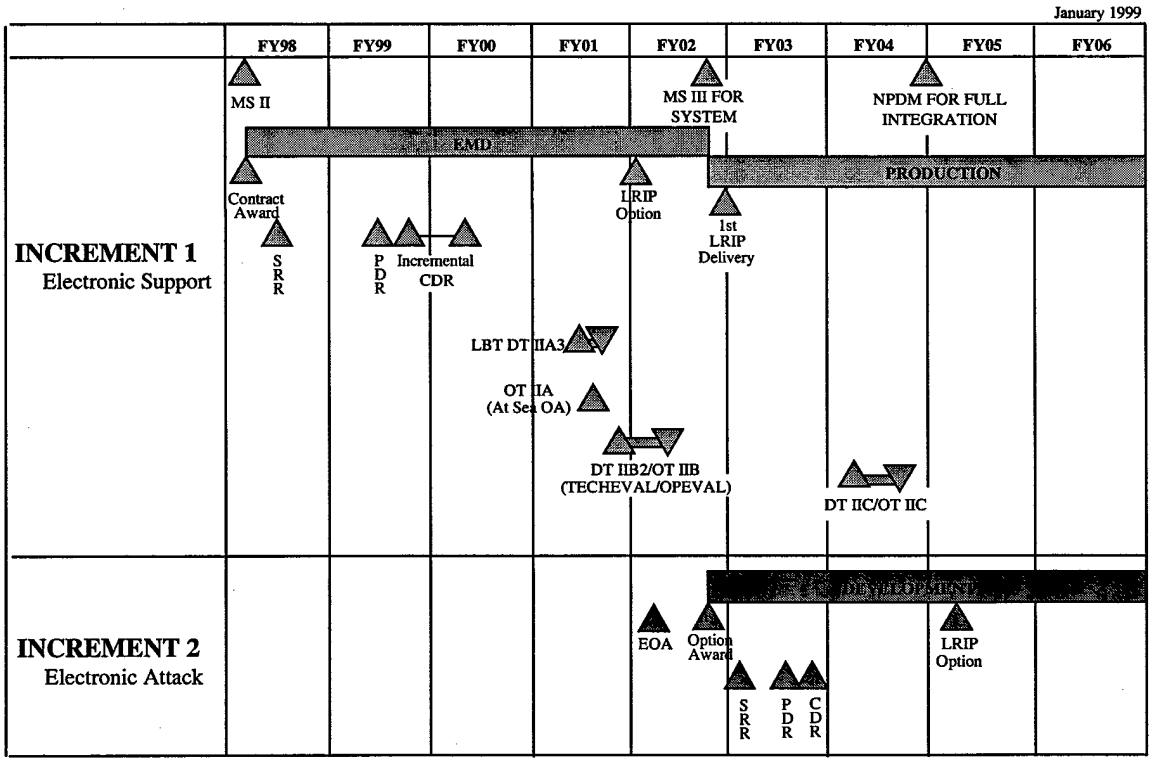


Exhibit R-3 Cost Analysis		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E,N/5	PROGRAM ELEMENT NAME AND NUMBER Ship Self Defense 0604755N	PROJECT NAME AND NUMBER Advanced Integrated Electronic Warfare System (AIEWS) U2309

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date			Cost To Complete	Total Cost	Target Value of Contract
Hardware Development	C/CPAF	LMIS Syracuse NY	10.636	24.522	12/98	26.383	11/99			15.959	77.500	73.249
Software Development	C/CPAF	DSR Fairfax VA	7.022	7.619	12/98	6.925	11/99			3.987	25.553	20.678
Systems Engineering	WR/RCP	NSWCDD	1.508	1.395	11/98	2.703	10/99			CONT	CONT	-
Miscellaneous	Various	Various	1.197	2.247	11/98	1.657	10/99			CONT	CONT	-
Q-70 Procurement	FFP	LM/Eagan	-	.900	03/99	-						
Award Fees	C/CPAF	LMIS	.665	* .665	06/99	1.330	03/00			.665		
	C/CPAF	DSR	.478	.713	04/99	.600	03/00					
		DSR				.593	11/00					
Subtotal Product Development			21.506	38.061		40.191				CONT	CONT	
Remarks: * Award Fee scheduled for obligation 06/99 (LMIS). For LMIS, Total Cost is government estimate from the Program Manager's Life Cycle Cost Estimate (PLCCE) developed by SEA 017.												
Specialty Engineering												
System/Subsystem Integration	PD	AEGIS/SSDS Integr	1.140	-	N/A	-	N/A			CONT	CONT	-
Integrated Logistics Support												
Training												
Technical Engineering Services	WR/RCP	NRL	.904	.961	11/98	1.416	10/99			CONT	CONT	-
Miscellaneous	Various	Various	.768	1.108	11/98	1.193	10/99			CONT	CONT	-
Subtotal Support			2.812	2.069		2.609				CONT	CONT	
Remarks:												

Exhibit R-3 Cost Analysis		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E,N/5	PROGRAM ELEMENT NAME AND NUMBER Ship Self Defense 0604755N	PROJECT NAME AND NUMBER Advanced Integrated Electronic Warfare System (AIEWS) U2309

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date			Cost To Complete	Total Cost	Target Value of Contract
Test Planning/ Pre-TECHEVAL Events	WR/RCP	NSWCDD	-	.200	1/99	.500	10/99			CONT	CONT	-
Miscellaneous	Various	Various	.070	.070	-	.100	10/99			CONT	CONT	-
Subtotal T&E			.070	.270		.600				CONT	CONT	
Remarks:												
Program Management Support	Various	Various	.290	.315	10/98	.344	10/99			CONT	CONT	-
Travel												
Subtotal Management			.290	.315		.344				CONT	CONT	
Remarks:												
Total Cost			24.678	40.715		43.744				CONT	CONT	
Remarks:												

Exhibit R-2a, RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY **RDT&E/BA5**	Program Element Name & No. SHIP SELF DEFENSE/0604755N	Project Name and Number. Infrared Search and Track (IRST) U2442/22649

Cost ($ in Millions)	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Project Cost	3.772	7.463	13.110	8.661	2.755	4.916	2.456	0.0	Continuing	Continuing
RDT&E Articles Qty										

A. (U) 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. IRST will declare those air targets to the ships' combat system.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) **FY 1998 ACCOMPLISHMENTS:**

- (U) ($ .050) Conducted acceptance testing of Stabilized Infrared Scanner, shipped unit to Lockheed Martin.
- (U) ($1.100) Completed software development, began software test.
- (U) ($1.500) Conducted data collection test at Wallops Island, VA.
- (U) ($ .772) Completed Signal Processing Control Unit (SPCU) assembly and checkout.
- (U) ($ .350) Began System Integration via CEC.

2. (U) **FY 1999 PLAN:**

- (U) **Complete IRST Phase 1.**
- (U) ($ .800) Conduct at-sea data collection as part of USN/FGN joint fleet exercise.
- (U) ($1.000) Conduct integrated Land Based Systems Test at Aegis Combat Systems Center (ACSC), Wallops Island, VA.
- (U) ($ .300) Continue Combat Systems Integration via CEC.
- (U) ($ .164) Portion of extramural program is reserved for Small Business Innovation Research assessment in accordance with 15 USC 638.
- (U) **Begin IRST Phase 2.**
- (U) ($2.300) Begin detector design and fabrication.
- (U) ($ .400) Complete scanner design and begin fabrication.
- (U) ($1.419) Begin SPCU Phase 2 modifications.
- (U) ($ .600) Begin software development.
- (U) ($ .480) Begin algorithm and simulation development.

3. (U) FY 2000 PLAN:

Exhibit R-2a, RDT&E Project Justification			Date: February 1999
APPROPRIATION/BUDGET ACTIVITY **RDT&E/BA5**	Program Element Name & No. SHIP SELF DEFENSE/0604755N	Project Name and Number. Infrared Search and Track (IRST) U2442/22649	

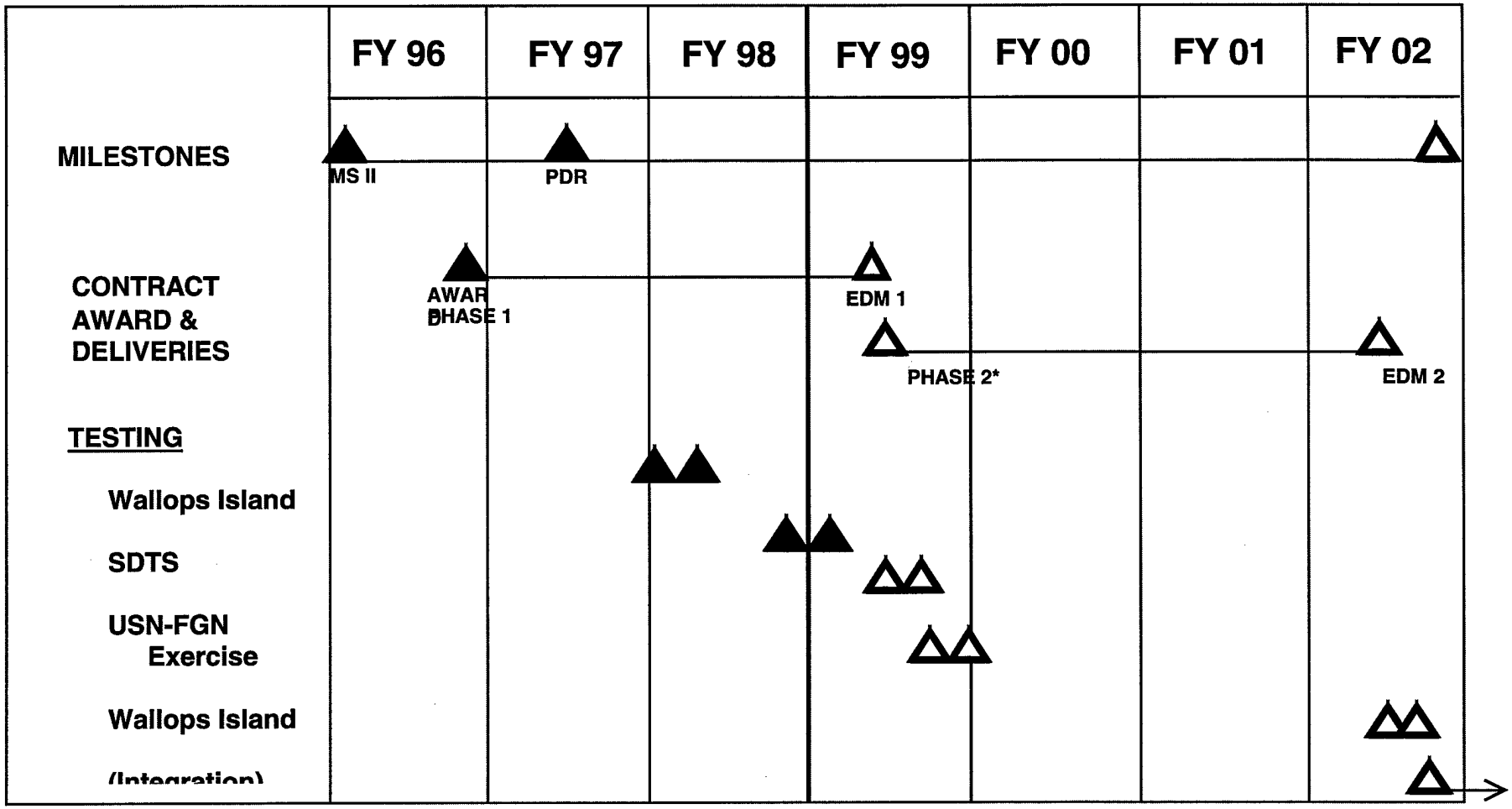
- (U) ($2.300) Complete detector design and fabrication. Begin acceptance test.
- (U) ($1.200) Continue scanner fabrication.
- (U) ($1.800) Continue SPCU Phase 2 modifications.
- (U) ($3.500) Continue software development.
- (U) ($1.510) Continue algorithm and simulation development.
- (U) ($2.800) Begin systems integration.

B. Other Program Funding Summary: Not Applicable

C. Acquisition Strategy: Proceed to production for USN new construction ships.

D. Schedule Profile: See attached.

Exhibit R-2a, RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E/BA5	Program Element Name & No. SHIP SELF DEFENSE/0604755N	Project Name and Number. Infrared Search and Track (IRST) U2442/22649



* PHASE 2 - OPTION IN CURRENT E&MD CONTRACT

Exhibit R-3 Cost Analysis		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E,N/5	PROGRAM ELEMENT NAME AND NUMBER Ship Self Defense 0604755N	PROJECT NAME AND NUMBER Infrared Search and Track (IRST) U2442/22649

Cost Categories PRODUCT DEVELOPMENT	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date			Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	C/CPAF	Lockheed Martin, Orlando, FL	19.593	3.900	3/99	9.610	11/99			Continuing	CONT.	CONT.
Ancillary Hardware Development	N/A	N/A	N/A	N/A	N/A	N/A	N/A			Continuing	CONT.	CONT.
Miscellaneous	Various	Various	10.386	1.500	various	3.300	various			Continuing	CONT.	CONT.
Subtotal Product Development			29.979	5.400		12.910						
Remarks:												
Development Support Equipment												
Software Development												
Training Development												
Integrated Logistics Support												
Configuration Management												
Technical Data												
Subtotal Support												
Remarks: N/A												

Exhibit R-3 Cost Analysis		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E,N/5	PROGRAM ELEMENT NAME AND NUMBER Ship Self Defense 0604755N	PROJECT NAME AND NUMBER Infrared Search and Track (IRST) U2442/22649

Cost Categories TEST AND EVALUATION	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date			Cost To Complete	Total Cost	Target Value of Contract
Land Based Test and Evaluation	N/A	NSWC/Lockheed Martin, Wallops Island, VA	1.500	1.000	3/99					Continuing	CONT.	CONT.
At-Sea Test & Evaluation		NSWC/Lockheed Martin, USN/FGN "May fly" Exercise		.800	3/99					Continuing	CONT.	CONT.
											CONT.	CONT.
											CONT.	CONT.
Subtotal T&E			1.500	1.800							CONT.	CONT.
Remarks:												
Cost Categories MANAGEMENT												
Miscellaneous	Various	Various	2.062	.263	11/98	.200	11/99			Continuing	CONT.	CONT.
Subtotal Management			2.062	.263		.200				Continuing	CONT.	CONT.
Remarks:												
Total Cost			33.541	7.463		13.110				Continuing	CONT.	CONT.
Remarks:												

FY 2000 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: January 1999

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604771N
PROGRAM ELEMENT TITLE: Medical / Dental Engineering

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
M2650 (Voice Instructional Devices)	0	1,497	0	0	0	0	0	0		
M0933 (Medical Dental Development)	3,106	4,310	4,285	4,400	4,509	4,626	4,727	4,830		
M2443 (Casualty Monitoring)	8,021	0	0	0	0	0	0	0		
M2444 (Navy Telemedicine)	4,529	0	0	0	0	0	0	0		
TOTAL	15,656	5,807	4,285	4,400	4,509	4,626	4,727	4,830		

Exhibit R-2a

FY 2000 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: January 1999

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604771N
PROGRAM ELEMENT TITLE: Medical / Dental Engineering

PROJECT NUMBER & TITLE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
M2650 Voice Instructional Devices (VID)										
	0	1,497	0	0	0	0	0	0		

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The purpose of this item 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 ACCOMPLISHMENT AND PLANS:

1. (U) FY 1999 PLAN:

- (U) ($1,460) VOICE INSTRUCTIONAL DEVICES (VID): This is a Congressional increase. Initial effort will be to modify the Army-developed device to meet Navy Medical requirements on ships and in the field. Subsequently, the prototype device will undergo a series of tests and evaluations in a field and shipboard environment.
- (U) ($37) SMALL BUSINESS INNOVATION RESEARCH (SBIR): Portion of extramural program reserved for SBIR assessment in accordance with 15 USC 638.

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1998	FY 1999	FY 2000
(U) President's Budget:	0	0	0
(U) Adjustments from FY 1999 PRESBUDG:	0	1,497	0

FY 2000 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: January 1999

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604771N
PROGRAM ELEMENT TITLE: Medical / Dental Engineering

(U) FY 2000 / 2001 President's Submission	0	1,497	0

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding:

(U) FY 1999: increase of (1,500) due to Congressional add for Voice Instructional Devices (VID); decrease of (-3) due to revised economic assumptions.

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

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

(U) RELATED RDT&E:

(U) Program Element 0603706N, Medical Development.

D. (U) SCHEDULE PROFILE: Not applicable.
(U) COST: (Dollars in Thousands)

PROJECT NUMBER &	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	TO	TOTAL

FY 2000 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: January 1999

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604771N
PROGRAM ELEMENT TITLE: Medical / Dental Engineering

TITLE	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	COMPLETE	PROGRAM
M0933 Medical / Dental Equipment Development										
	3,106	4,310	4,285	4,400	4,509	4,626	4,727	4,830		

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The purpose of this item 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 ACCOMPLISHMENT AND PLANS:

1. (U) FY 1998 ACCOMPLISHMENTS:

- (U) ($209) HEARING PROTECTION: Developed low-cost, high efficiency hearing protection. Potential benefit is $48M per year navy Department VA claims, $8M per year navy civilian claims. Patents and licenses will be enormously valuable.
- (U) ($434) 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) ($1,212) 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 Navy / Army effort.
- (U) ($450) SPATIAL DISORIENTATION / VESTIBULAR VEST: Two devices for novel vestibular tests have been designed and either built of contracted out for development.
- (U) ($440) TELEMEDICINE: Began the development and integration of the Medical Information Management System (MIMS) to be deployed on tactical ships with medical responsibilities.
- (U) ($204) ACTIVE NOISE CANCELLATION STETHOSCOPE: Designed test chamber to evaluate hardware as it becomes available for testing.

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604771N
PROGRAM ELEMENT TITLE: Medical / Dental Engineering

- (U) ($157) MEDICAL WARGAMING: Began the development of medical wargaming models to interface with line wargaming for readiness planning, training, rehearsal, and assessment. Completed the first medical oriented wargame.

2. (U) FY 1999 PLAN:

- (U) ($323) ENHANCED HEARING PROTECTION: Continue transition and testing of developed passive hearing protection material to Navy / Marine Corps application. Continue refinement of development items.

- (U) ($1,633) 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) ($422) SPATIAL DISORIENTATION / VESTIBULAR VEST: Two devices for novel vestibular tests have been designed and either built of contracted out for development.

- (U) ($492) TELEMEDICINE: 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) ($269) ACTIVE NOISE CANCELLATION STETHOSCOPE: Continue development of medical stethoscope device for cardiac monitoring in high noise shipboard and combat environments.

- (U) ($287) POTABLE WATER TESTING: Initiate development of simple, portable device for testing potable water quality for use in combat environments.

- (U) ($403) 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) ($439) LASER THREAT ANALYSIS: Begin development of mission planning tools needed to minimize the emerging threat of man portable lasers to aircrews.

- (U) ($42) CARBON DIOXIDE SENSOR: Begin development of carbon dioxide sensor for Fleet divers.

2. (U) FY 2000 PLAN:

FY 2000 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: January 1999

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604771N
PROGRAM ELEMENT TITLE: Medical / Dental Engineering

- (U) ($138) ENHANCED HEARING PROTECTION: Complete transition and testing of developed passive hearing protection material to Navy / Marine Corps applications.
- (U) ($1,242) 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) ($522) 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) ($480) TELEMEDICINE: Complete the development and integration of the Medical Information Management System (MIMS) to be deployed on tactical ships with medical responsibilities.
- (U) ($385) ACTIVE NOISE CANCELLATION STETHOSCOPE: Complete development of medical stethoscope device for cardiac monitoring in high noise shipboard and combat environments.
- (U) ($345) POTABLE WATER TESTING: Continue development of simple, portable device for testing potable water quality for use in combat environments.
- (U) ($552) UNDERWATER SOUND PROTECTION: Complete development of protection from bioeffects for divers exposed to intense underwater sound.
- (U) ($345) LASER THREAT ANALYSIS: Begin development of mission planning tools needed to minimize the emerging threat of man portable lasers to aircrews.
- (U) ($276) CARBON DIOXIDE SENSOR: Continue development of a sensor / alarm system to warn of hazardous CO_2 levels in the closed-circuit rebreathers worn by divers on SPECWAR, EOD and mine countermeasure missions.

FY 2000 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: January 1999

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604771N
PROGRAM ELEMENT TITLE: Medical / Dental Engineering

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1998	FY 1999	FY 2000
(U) President's Budget:	3.513	4,321	4,342
(U) Adjustments from FY 1999 PRESBUDG:	-407	-11	-57
(U) FY 2000 / 2001 President's Submission	3,106	4,310	4,285

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding:

(U) FY 1998: decrease of (-407) for FY 1998 Actual updatee.

(U) FY 1999: decrease of (-10) for Sec. 8108 Revised Economic Assumption; decrease of (-1) for Civilian Personnel Underexecution.

(U) FY 2000: decrease of (-62) for Non Pay Inflation; increase of (8) for NWCF Rates - NCCOSC; increase of (3) for Civilian Pay Rates.

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

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

(U) RELATED RDT&E:

(U) Program Element 0603706N, Medical Development.

D. (U) SCHEDULE PROFILE: Not applicable.

(U) COST: (Dollars in Thousands)

PROJECT NUMBER &	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	TO	TOTAL

FY 2000 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: January 1999

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604771N
PROGRAM ELEMENT TITLE: Medical / Dental Engineering

TITLE	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	COMPLETE	PROGRAM
M2443 Casualty Monitoring										
	8,021	0	0	0	0	0	0	0		

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The purpose of this item 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 ACCOMPLISHMENT AND PLANS:

1. (U) FY 1998 ACCOMPLISHMENTS:

(U) ($8,021) CASUALTY MONITORING AND STABILIZATION: Coordination has taken place with several hospitals to collect heart rate variability data in trauma patients. Contracts for supply of components for a diagnostic glove have been negotiated. Plans to expand efforts in suspended animation are being developed.

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1998	FY 1999	FY 2000
(U) President's Budget:	8,021	0	0
(U) Adjustments from FY 1999 PRESBUDG:	0	0	0
(U) FY 2000 / 2001 President's Submission	8,021	0	0

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: Not applicable.

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

FY 2000 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: January 1999

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604771N
PROGRAM ELEMENT TITLE: Medical / Dental Engineering

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

(U) RELATED RDT&E:

(U) Program Element 0603706N, Medical Development.

D. (U) SCHEDULE PROFILE: Not applicable.

(U) COST: (Dollars in Thousands)

PROJECT NUMBER &	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	TO	TOTAL

FY 2000 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: January 1999

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604771N
PROGRAM ELEMENT TITLE: Medical / Dental Engineering

TITLE	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	COMPLETE	PROGRAM
M2444 Telemedicine										
	4,529	0	0	0	0	0	0	0		

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The purpose of this item 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 ACCOMPLISHMENT AND PLANS:

1. (U) FY 1998 ACCOMPLISHMENTS:

- (U) ($4,529) TELEMEDICINE: There are several items of progress to report for this Congressional plus-up. An Analytic Plan has been developed for the proposed Joint Medical Operations - Telemedicine ACTD. Measures of effectiveness, success and performance have been identified for evaluating the insertion of telemedicine capability into operational medicine. An exercise plan has been created to evaluate the technical performance of the component devices.

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1998	FY 1999	FY 2000
(U) President's Budget:	4,529	0	0
(U) Adjustments from FY 1999 PRESBUDG:	0	0	0
(U) FY 2000 / 2001 President's Submission	4,529	0	0

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: Not applicable.

(U) Schedule: Not applicable.

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604771N
PROGRAM ELEMENT TITLE: Medical / Dental Engineering

(U) Technical: Not applicable.

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

(U) RELATED RDT&E:

(U) Program Element 0603706N, Medical Development.

D. (U) SCHEDULE PROFILE: Not applicable.

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604777N
PROGRAM ELEMENT TITLE: Navigation/ID Systems

(U) COST: (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1998 ACTUAL	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
F0253 Navigation and Electro-optical Support	6,764	9,586	4,062	1,578	2,300	3,131	1,690	1,725	CONT.	CONT.
W1253 Combat ID System	352	0	0	0	0	0	0	0	0	98,786
W2212 All Service Combat Identification Evaluation Test (ASCIET)	4,486	3,558	2,469	4,042	4,113	4,168	4,258	4,349	CONT.	CONT.
X0921 NAVSTAR GPS Equipment	23,167	25,855	9,960	9,819	10,145	20,032	21,460	18,132	CONT.	CONT.
X2303 Combat Survivor Evader Locator (CSEL)	447	0	0	0	0	0	0	0	0	1,286
X2313 Situational Awareness Beacon with Reply (SABER)	4,610	6,993	3,317	1,147	1,130	1,161	1,189	1,217	CONT.	CONT.
TOTAL	37,732	45,992	19,808	16,586	17,688	28,492	28,597	25,423	CONT.	CONT.

(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), project (X0921) 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. 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 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), 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 radio capable of Over-The-Horizon (OTH) and Line-Of-Sight (LOS) secure and non-secure communications, plus a Collection Of Broadcast from Remote Assets (COBRA) transmitter.

B. (U) PROGRAM CHANGE SUMMARY: See individual projects.

C. (U) OTHER PROGRAM FUNDING SUMMARY:

	FY 1998 ACTUAL	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY2004 ESTIMATE	FY2005 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
X0921										
(U) O&MN PE#: 0305164N	2,811	1,378	2,236	2,428	2,494	2,559	2,594	2,659	cont.	cont.
(U) OPN Line #26570	4,824	9,502	8,518	9,987	9,295	9,409	9,618	9,283	cont.	cont.
(U) APN-Common Avionics	54,234	29,338	9,259	17,867	14,108	24,162	13,417	13,414	cont.	cont.

(U) RELATED RDT&E: None

DATE: February 1999

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604777N
PROGRAM ELEMENT TITLE: Navigation/ID Systems

X2303:	FY 1998 ACTUAL	FY 1999 EST	FY 2000 EST	FY 2001 EST	FY 2002 EST	FY 2003 EST	FY2004 EST	FY2005 EST	TO COMP	TOTAL PROG
(U) O&MN PE# 0708017N	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	Cont	Cont
(U) OPN PE# 0708017N	2,713	13,741	18,369	18,483	7,424	7,103	6,878	5,866	Cont	Cont
(U) RELATED RDT&E: None										
x2313:										
(U) OPN #285100:	0	1,022	4,178	4,336	4,735	3,304	3,373	3,443	Cont	Cont
(U) O&MN #AG/SAG 1A4A:	908	970	1,966	3,578	3,923	6,555	6,723	6,898	Cont	Cont
F0253:										
(U) SCN Line 201300	20,000	16,000	0	15,900	16,200	0	17,300	35,000	Cont	Cont

(U) RELATED RDT&E:
(U) PE 0603226E (Experimental Evaluation of Innovative Technology)
(U) PE 0604558N (New Design SSN Development)

D. (U) ACQUISITION STRATEGY: See individual projects.

E. (U) SCHEDULE PROFILE: See acquisition startegy paragraph in each individual project.

DATE: February 1999

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604777N
PROGRAM ELEMENT TITLE: Navigation/ID Systems

Cost ($ in Thousands)	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Project Cost	6,764	9,586	4,062	1,578	2,300	3,131	1,690	1,725	Cont	Cont
RDT&E Articles Qty		1								

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 Electronic Support Measures (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, is designed for forward fit on the New Attack Submarine and for backfit on the earlier ship classes, SSN-688 and SEAWOLF

(U) Program Accomplishments and Plan:

1. (U) FY 1998 Accomplishments:

- (U) ($6,565) Continued Photonics Program Engineering and Manufacturing Development Phase
- (U) ($750) Performed Photonics Program Functional Configuration Audit (FCA) and Physical Configuration Audit (PCA)
- (U) ($124) Performed Photonics Program/Universal Modular Mast DT IIA testing

2. (U) FY 1999 Plan:

- (U) ($7,045) Deliver Engineering Development Model
- (U) ($2,000) Commence On-Board Team Trainer Development
- (U) ($419) Perform Photonics System/Universal Modular Mast DT IIB testing.
- (U) ($122) Portion of extramural program is reserved for Small Business Inovation Research assessment in accordance with 15 USC 638

DATE: February 1999

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604777N
PROGRAM ELEMENT TITLE: Navigation/ID Systems

3. (U) FY2000 Plan:

- (U) ($2,068) Complete Engineering Development Model
- (U) ($750) Continue On-Board Team Trainer Development
- (U) ($1,244) System Engineering and OT11 support

B. (U) Other Program Funding Summary

	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Complete	Total Cost
(U) SCN Line 201300	20,000	16,000	0	15,900	16,200	0	17,300	35,300	Cont.	Cont.

Related RDT&E

(U) PE 0603226E (Experimental Evaluation of Innovative Technology)
(U) PE 0604558N (New Design SSN Development)

C. (U) Acquisition Strategy: Not applicable.

D. (U) Schedule Profile: See attached.

EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604777N
PROGRAM ELEMENT TITLE: Navigation/ID Systems

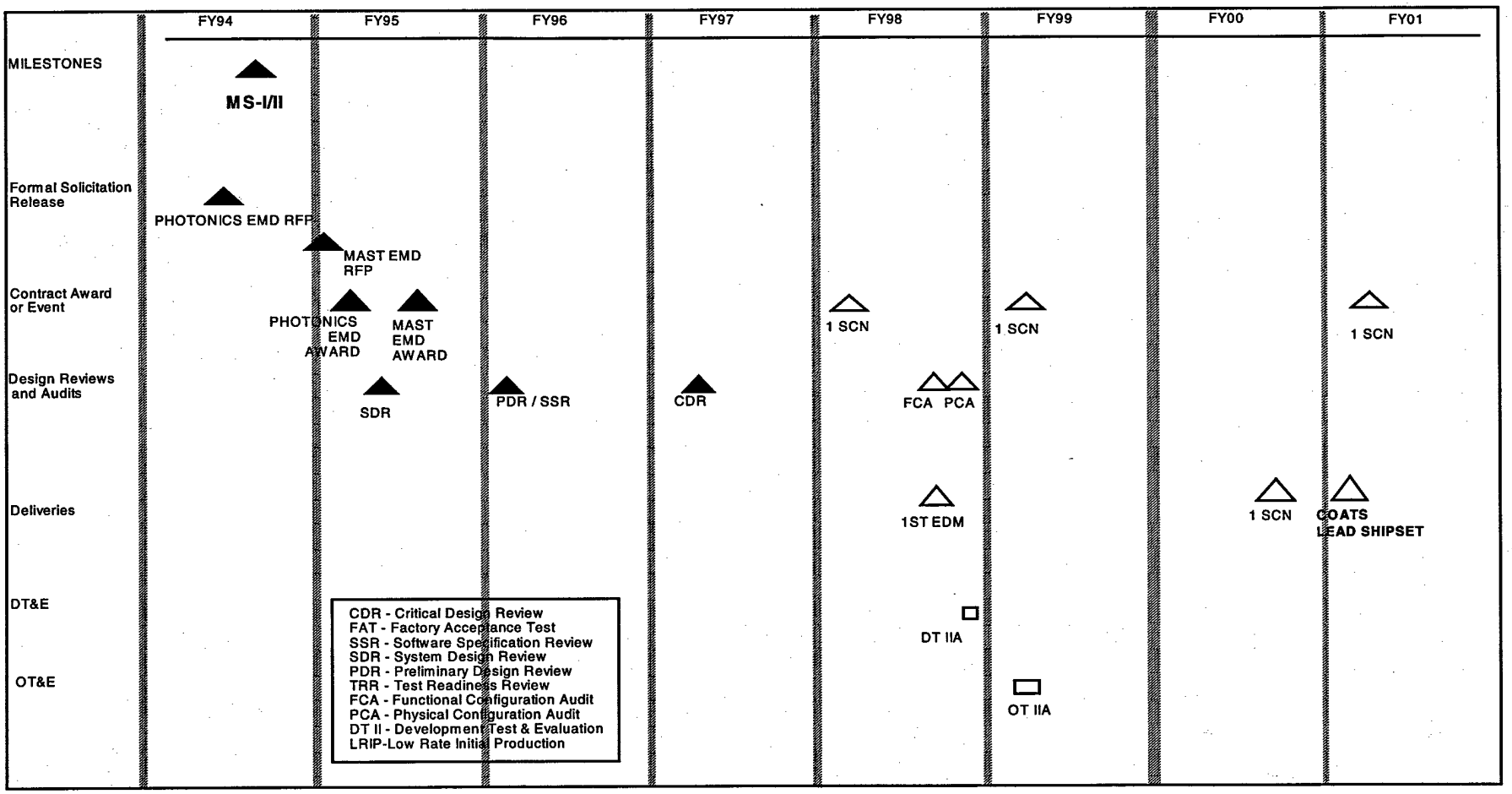


Exhibit R-3, Cost Analysis			Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&EN/5	Navigation/ID Systems/0604777N	Project Name and Number. Navigation and Electro-Optical Support/F0253	

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total Pys Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date			Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	CPIF	Kollmorgen, Northampton MA	25,300	8,018	10/98	1,644	10/99			279	31,000	31,000
Ancillary Hardware Development												
Systems Engineering	Various	Various	1,000	1,000		1,800				Cont.	Cont.	
Licenses												
Tooling												
GFE												
Award Fees												
Subtotal Product Development			26,300	9,018		3,444				Cont.	Cont.	

Remarks:

Development Support Equipment	Contract Method & Type	Performing Activity & Location	Total Pys Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date			Cost To Complete	Total Cost	Target Value of Contract
Software Development												
Training Development												
Integrated Logistics Support												
Configuration Management												
Technical Data												
GFE												
Subtotal Support												

Remarks:
Not Applicable

EXHIBIT R-3, FY 2000 RDT&E,N PROJECT COST ANALYSIS

DATE: February 1999

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604777N
PROGRAM ELEMENT TITLE: Navigation/ID Systems

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total Pys Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date			Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation												
Operational Test & Evaluation												
Tooling												
GFE												
Subtotal T&E												
Remarks: Not Applicable												
Management Support Services & Engineering Technical Services	PD	SWL	2,000	230		230				Cont.	Cont.	
Miscellaneous	Various	Various	98	288		338				Cont.	Cont.	
Travel			266	50		50				Cont.	Cont.	
Subtotal Management			2,364	568		618				Cont.	Cont.	
Remarks:												
Total Cost			28,664	9,586		4,062				Cont.	Cont.	
Remarks:												

DATE: February 1999

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604777N
PROGRAM ELEMENT TITLE: Navigation/ID Systems

(U) COST: (Dollars in Thousands)

Project Number & Title	FY 1998 Budget	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete	Total Program
W2212 All Service Combat Identification Evaluation Test (ASCIET)	4,486	3,558	2,469	4,042	4,113	4,168	4,258	4,349	CONT.	CONT.
TOTAL	4,486	3,558	2,469	4,042	4,113	4,168	4,258	4,349	CONT.	CONT.

Quantity of RDT&E Articles: 0

(U) A. 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 1998 ACCOMPLISHMENTS:

- (U) ($4,486): Planned and prepared for 1999 test and evaluation of combat identification platforms and systems in the air-to-air and ground-to-air mission areas.

2. (U) FY 1999 PLAN:

- (U) ($3,558) Conduct test and evaluation of combat identification platforms and systems in the air-to-air and ground-to-air mission areas.

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604777N
PROGRAM ELEMENT TITLE: Navigation/ID Systems

3. (U) FY 2000 PLAN:

- (U) ($2,469) Conduct test and evaluation of combat identification platforms and systems in the air-to-air and ground-to-air mission areas.

(U) B. PROGRAM CHANGE SUMMARY	FY 1998	FY 1999	FY 2000
(U) FY 1999 President's Budget:	1,507	3,968	4,019
(U) Appropriated Value:	1,552	3,968	
(U) Adjustments from Pres Budget:	+2934	-410	-1,550
(U) (U) FY 2000 Pres Budget Submit:	4,486	3,558	2,469

CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1998 net increase of $2934 thousand resulted from a reprogramming of $2843 thousand for additional planning required for the 1999 test and evaluation of combat identification platforms and systems in the air-to-air and ground mission areas, and an increase of $38 thousand for other OSD adjustments; decreases of $41 thousand for the Small Business Innovation Research assessment and $12 thousand for other Navy priorities. FY 1999 net decrease of $410 thousand resulted from a decrease of $401 thousand based on inadequate expenditures, and a decrease of $9 thousand for minor program adjustment. FY 2000 decrease of $1,514 thousand based on inadequate expenditures, and $36 thousand for a minor program adjustment.

(U) Schedule: N/A.
(U) Technical: N/A.

(U) C. OTHER PROGRAM FUNDING SUMMARY: N/A.
RELATED RDT&E: N/A.

(U) D. ACQUISITION STRATEGY: This is a non-ACAT program and requires no specific acquisition strategy.

(U) E. SCHEDULE PROFILE: N/A.

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604777N
PROGRAM ELEMENT TITLE: Navigation/ID Systems

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Subtotal Project Development			0	0		0		0	0	
Remarks:										
	Method & Type	Activity & Location	Prior Yrs Cost	FY 1999 Cost	Award Date	FY 2000 Cost	Award Date	Cost to Complete	Total Cost	Value of Contract
Subtotal Support			0	0		0		0	0	
Remarks:										
	VAR	Eglin AFB , FL	10,198	3,558	MISC.	2,469	MISC.	CONT.	CONT.	CONT.
Subtotal Test & Evaluation			10,198	3,558	MISC.	2,469	MISC.	CONT.	CONT.	CONT.
Remarks:										
Subtotal Management			0	0		0		0	0	
Remarks:										
Total Cost			10,198	3,558	MISC.	2,469	MISC.	CONT.	CONT.	CONT.

R-1 Shopping List –

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604777N

(U) COST: (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1998 ACTUAL	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
X0921 NAVSTAR Global Positioning System (GPS) Equipment	23,167	25,855	9,960	9,819	10,145	20,032	21,460	18,132	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The mission is to provide supported, affordable, integrated, and interoperable navigation solutions to the warfighters. RDT&E funds are used to perform all the non-recurring Global Positioning System (GPS) Surface Ship, Submarine and Aircraft Integration efforts. The Aircraft integration efforts are required for 83 different configurations of Navy, Marine Corps and Coast Guard aircraft in response to the CNO GPS Integration Guidance (GIG), the Public Law 103-160 and the Secretary of Defense As Soon As Possible direction of April 1996 (ASAP program). The GIG directs GPS design functional characteristics for the aircraft and Public Law 103-160 directs the schedule for completion of all installations by 30 September 2000. The 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/PMA-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/PMA-187 and the platform program offices with APN dollars. The primary tasks to be accomplished for each of the 83 aircraft configurations include: GPS integration design studies; acquisition of aircraft and lab RDT&E assets; development of test aircraft hardware and/or software designs; development of Integrated Logistics Support (ILS) elements to support test (operator and maintenance training, technical 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 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 Automated Mission Planning System (TAMPS)/Joint Mission Planning System (JMPS). The Surface Ship and Submarine integration efforts include two vitally important navigation integration initiatives. The first program is the Navigation Sensor System Interface (NAVSSI) development. The NAVSSI is the surface ship system with operational requirement of integrating 179 systems on 161 surface ship platforms. This operational requirement for the NAVSSI has two distinct functions. The first is the integration and distribution of real time navigation and time sources, primarily GPS, to combat systems, combat support systems, air alignment systems and support systems. The second is as the primary surface ship navigators' electronic workstation required to perform fully integrated Electronic Chart Display Information System for the Navy (ECDIS-N) navigation. NAVSSI is an evolutionary acquisition development. The second surface ship development program is the replacement of the AN/WRN-6, which is out of production and approaching obsolescence, with low cost VME card technology

(GPS VME Receiver Card (GVRC)) combined with Fiber Optic Antenna Link (FOAL) antenna capability. For NAVSSI ships, this integration will be done in conjunction with NAVSSI integrations. For non-NAVSSI surface ships, PMW/PMA 187 is developing a low cost system to replace the AN/WRN-6. For submarine systems, PMW/PMA 187 is supporting ongoing NAVSEA initiatives for the replacement of the AN/WRN-6 systems with the GVRC card technology. The Operational Requirements Document for Global Positioning System - Navigation Warfare, specifies that the military forces shall have a jam resistance capability to meet mission requirements in an electronically challenged environment. Given the current threat to GPS navigation from jamming, and the increasing use of GPS by potential adversaries, RDT&E funds are required to design, develop, and test equipment for use on naval platforms. Funds are also required to integrate GPS modernization capabilities into naval platforms. All of the above efforts are directed by, tasked by and funded by PMW/PMA-187.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1998 ACCOMPLISHMENTS:

- (U) ($12,768) Continue integration engineering on RC-12M, RC-12F, RC-12B, UC-12M, UC-12B, F-14B, F-14D, VH-3D, VH-60N, EA-6B, F/A-18A/B, P-3, UP-3, VP-3, C-20D, C-20G, T-34, T-44, MH-53, CH-53D, CH-53E, CH-46E, E-2C, C-9, DC-9, TH-57C, SH-60R, HH-1N, KC-130, C-130, HC-130 aircraft.

- (U) ($9,922) Continue NAVSSI upgrade, integration engineering, logistics element development and testing with shipboard combat, weapons, navigation, and command and control systems. Evolutionary upgrades include collection/distribution of precise navigation and time data from/to gun weapons systems (MK-160 and MK-86), the Joint Maritime Command Information System (via LAN), HAVEQUICK Radio (WSC-3), Ring Laser Gyro Navigator (RLGN), Combat DF, ATWCS, Battle Force Tactical Trainer (BFTT), Fiber Optic Digital Multiplexing System (DMS), Doppler Sonar Velocity Log (DSVL) and SQS-53 Sonar. Other efforts include calibration of all navigation positional data to Own Ship Reference Point, integration of a precise time distribution unit, completion of year 2000 initiatives, integration of GPS VME Receiver Card (GVRC)/Fiber Optic Antenna Link (FOAL) and continued support of the Coast Guard for our joint Command Display and Control (COMDAC) development and development of Computer Based Training Systems and integration of Electronic Technical Manuals. Starting efforts to be finished in subsequent fiscal years include transition NAVSSI hardware/software into an NT compliant environment, chart distribution technology, radar overlay of charting segment, integration of Theater Ballistic Missile Defense (TBMD) precise navigation output and bathymetric data logging. Continue RDT&E support of CVN-76, LHD-7 and LPD-17 Navigation integration efforts. Continue RDT&E support of the New Attack Submarine (NSSN) integration of GVRC. Continue development of NAVSSI Computer Based Trainer (CBT) to meet the standards of the current NAVSSI Block. Continue development of Interactive Electronic Technical Manual (IETM) to meet the standards of the current NAVSSI Block.

- (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.

2. (U) FY 1999 PLAN:

- (U) ($9,823) Continue integration engineering on F-14B, F-14D, F/A-18A/B, EA-6B, EP-3E, SH-60R, F-5, MH-53E, P-3C, C-20D, T-39N, C-12, C-9, CT-39G and AH-1W.

- (U) ($11,000) Continue NAVSSI upgrade, integration engineering and testing with shipboard combat, weapons, navigation, and command and control systems. Evolutionary upgrades include all integrations required for the support of Air Craft Carrier Platform Integrations, TBMD integration, radar overlay integration and Extended Range Guided Munitions (ERGM) integration. Testing of evolutionary upgrades include collection/distribution of precise navigation and time data from/to gun weapons systems (MK-160 and MK-86), the Joint Maritime Command Information System (via LAN), HAVEQUICK Radio (WSC-3), Ring Laser Gyro Navigator (RLGN), Combat DF, ATWCS, Battle Field Tactical Trainer (BFTT), Fiber Optic DMS, DSVL SQS-53 Sonar, calibration of all navigation positional data to Ship Own Ship Reference Point, integration of a precise time distribution unit, completion of year 2000 initiatives, integration of GPS VME Receiver Card (GVRC)/Fiber Optic Antenna Link (FOAL). Begin integration of Coast Guard COMDAC charting segment into NAVSSI. Develop prototype for transitioning NAVSSI hardware/software into an NT compliant environment. Continue RDT&E support of CVN-76, LHD-7 and LPD-17 Navigation integration efforts. Continue RDT&E support of NSSN integration of GVRC. Continue development of NAVSSI Computer Based Trainer (CBT) to meet the standards of the current NAVSSI Block. Continue development of Interactive Electronic Technical Manual (IETM) to meet the standards of the current NAVSSI Block.

- (U) ($2,316) Initiate efforts to develop solutions to the GPS vulnerability problem and develop complimentary navigation prevention capabilities for incorporation on selected Naval air, surface, and subsurface platforms. This effort includes the Research, Development, Test and Evaluation (RDT&E) of anti-jam GPS user equipment and prevention equipment that is fully interoperable with all land, sea, and air combat applications. Anti-jam user equipment enhancements and prevention capabilities have been identified as a requirement in the Navigation Warfare Mission Need Statement which has been validated by the Joint Oversight Requirements Council. The military forces must meet the precise position, velocity, and time requirements defined in the Operational Requirements Document (ORD) for Global Positioning System - Navigation Warfare. Tasks to accomplish these requirements include: (1) perform modeling and simulation to identify specific platforms in need of a Navigation Warfare capability, (2) coordinate research with the platforms to develop specifications and integration documents suitable for hardware designs, and (3) develop and test equipment necessary to satisfy the

Navigation Warfare mission requirements. These RDT&E steps are necessary to develop hardware solutions so acquisition funds may be applied to the purchase and integration of the developed solutions.

- (U) ($2,716) Initiate efforts to modernize the navigation capability on Naval air, surface, and subsurface platforms. The Global Positioning System is managed by an Interagency GPS Executive Board (IGEB) which is comprised of members from the Department of Defense (DoD) and the Department of Transportation (DoT). A decision was made by the IGEB to modernize the GPS signals for enhanced civilian and military performance. The impacts of the various signal structure alternatives and the method to upgrade the user equipment must be identified. Funds for Research, Development, Test and Evaluation are needed to develop user equipment that will incorporate the National Air Space (NAS) Non-Precision Approach (NPA) sole/primary IFR navigation requirements into Naval aviation platforms. The NPA GPS requirement has been identified in the Federal Radionavigation Plan, chairman Joint Chiefs of Staff Master Navigation Plan, and CNO's Draft GPS Integration Guidance.

3. (U) FY 2000 PLAN:

- (U) ($5,020) Continue NAVSSI upgrade, integration engineering and testing with shipboard combat, weapons, navigation, and command and control systems. Evolutionary upgrades include all integrations required for the support of Aircraft Carrier Platform Integrations, TBMD integration, radar overlay integration and ERGM integration. Testing of evolutionary upgrades include collection/distribution of precise navigation and time data from/to Aircraft Carrier Systems, TBMD, radar overlay, COMDAC Charting integration, and ERGM. Transition NAVSSI hardware/software into an NT compliant environment. Develop interface support for CVN-76, LHD-7 and LPD-17 Navigation integration efforts. Begin integrations with TESS, PLRS, weather tracking, IBS and TPX-42. Begin development of the low cost GPS replacement system. Begin development for integration into emerging combat, combat support and support systems. Continue RDT&E support of NSSN integration of GVRC. Continue development of NAVSSI Computer Based Trainer (CBT) to meet the standards of the current NAVSSI Block. Continue development of Interactive Electronic Technical Manual (IETM) to meet the standards of the current NAVSSI Block.

- (U) ($2,315) Continue aircraft integration effort.

- (U) ($2,010) Continue efforts to develop solutions to the GPS vulnerability problem and develop complimentary navigation prevention capabilities for incorporation on selected Naval air, surface, and subsurface platforms. This effort includes the Research, Development, Test and Evaluation (RDT&E) of anti-jam GPS user equipment and prevention equipment that is fully interoperable with all land, sea, and air combat applications. Anti-jam user equipment enhancements and prevention capabilities have been identified as a requirement in the Navigation Warfare Mission Need Statement which has been validated by the Joint Oversight Requirements Council. The military forces must meet the precise position, velocity, and time requirements defined in the Operational Requirements Document (ORD) for Global Positioning System - Navigation Warfare. Tasks to accomplish these requirements include: (1) perform modeling and simulation to identify specific platforms in need of a Navigation Warfare capability, (2) coordinate research with the platforms to develop specifications and integration documents suitable for hardware designs, and (3) develop and test equipment necessary to satisfy the Navigation Warfare mission requirements. These RDT&E steps are necessary to develop hardware solutions so acquisition funds may be applied to the purchase and integration of the developed solutions.

- (U) ($615) Continue efforts to modernize the navigation capability on Naval air, surface, and subsurface platforms. The Global Positioning System is managed by an Interagency GPS Executive Board (IGEB) which is comprised of members from the Department of Defense (DoD) and the Department of Transportation (DoT). A

decision was made by the IGEB to modernize the GPS signals for enhanced civilian and military performance. The impacts of the various signal structure alternatives and the method to upgrade the user equipment must be identified. Funds for Research, Development, Test and Evaluation are needed to develop user equipment that will incorporate the National Air Space (NAS) Non-Precision Approach (NPA) sole/primary IFR navigation requirements into Naval aviation platforms. The NPA GPS requirement has been identified in the Federal Radionavigation Plan, chairman Joint Chiefs of Staff Master Navigation Plan, and CNO's Draft GPS Integration Guidance.

B. (U) PROGRAM CHANGE SUMMARY

(U) FY 1998: Funding change of -$179K for SBIR reduction; +$250K for BTRs. FY 1999: Funding change of -$60K for revised economic assumptions; -$14K for civilian personnel under execution; -$118 for CAAS. FY 2000: Funding change of =$45K for NWCF rates; -$131K for inflation adjustments.

(U) Schedule: None.

(U) Technical: None.

(U) COST: (Dollars in thousands)

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

	FY 1998 ACTUAL	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY2004 ESTIMATE	FY2005 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
(U) O&MN PE#: 0305164N	2,811	1,378	2,236	2,428	2,494	2,559	2,594	2,659	cont.	cont.
(U) OPN Line #26570	4,824	9,502	8,518	9,987	9,295	9,409	9,618	9,283	cont.	cont.
(U) APN-Common Avionics	54,234	29,338	9,259	17,867	14,108	24,162	13,417	13,414	cont.	cont.

(U) RELATED RDT&E: None

D. (U) ACQUISTION STRATEGY: NOT APPLICABLE FOR PROJECT X0921, ALL MILESTONES AND SCHEDULES ARE COMPLETED

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604777N

Exhibit R-3 Cost Analysis (page 1)												Date: February 1999
APPROPRIATION/BUDGET ACTIVITY: 5		PROGRAM ELEMENT: 0604777N										PROJECT NAME AND NUMBER: X0921 NAVSTAR GPS Equipment
Cost Categories	Contract Method & Type	Performing Activity & Location	Total Pys Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date			Cost To Complete	Total Cost	Target Value of Contract
Product Dev (F-14B)	SS	Grumman Aero	9,466	2,000	12/98	0				0	11466	
Product Dev (F-18B)	SS	Boeing	12,814	3,096	12/98	0				0	15,910	
Product Dev (S-3B, F-14D, C12, etc)	Various	Other Contracts	233,240	2,173	Var	2,804	Var			Cont	Cont	
Product Dev (SSC-SD)	NA	SSC-SD	38,481	8,494	10/98	3,234	10/99			Cont	Cont	
Product Dev (Other Inhouse)	NA	Various Field Act	430,063	7,814	10/98	2,983	10/99			Cont	Cont	
Subtotal Product Development			724,064	23,577		9,020				Cont	Cont	
Remarks:												
Support	Various	Various	12,710			0				0	12,710	
Subtotal Support			12,710			0		0		0	12,710	
Remarks												

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604777N**

Exhibit R-3 Cost Analysis (page 2)												Date: February 1999
APPROPRIATION/BUDGET ACTIVITY: 5			PROGRAM ELEMENT: 0604777N							PROJECT NAME AND NUMBER: X0921 NAVSTAR GPS Equipment		
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date			Cost To Complete	Total Cost	Target Value of Contract
T&E (NAWC PAX)	NA	NAWC PAX	8,353	878	10/98	338	10/99			Cont	Cont	
Subtotal T&E			8,353	878		338				Cont	Cont	
Remarks												
Project Management Support	T&M	DCS Corp, San Diego	1,600	1,400		601				Cont	Cont	
Subtotal Management			1,600	1,400		601				Cont	Cont	
Remarks												
Total Cost			746,727	25,855		9,960				Cont	Cont	
Remarks												

R-1 Shopping List –

DATE: February 1999

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604777N
PROGRAM ELEMENT TITLE: Navigation/ID Systems

(U) COST: (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1998 ACTUAL	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
X2303 Combat Survivor Evader Locator (CSEL)	447	0	0	0	0	0	0	0	0	1291

(U) 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.

(U) COST: (Dollars in thousands)
(U) PROGRAM PLANS:

2. (U) FY 1998 ACCOMPLISHMENTS:

- (U) ($70) Conduct shipboard rescue center integration analysis.

- (U) ($104) EMD System assessment.
- (U) ($123) 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

(U) B. (U) PROGRAM CHANGE SUMMARY:

CHANGE SUMMARY EXPLANATION:

(U) FY 1998: Funding change of -$14K for Congressional undistributed general adjustments, -$2K for BTR issue.

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

	FY 1998 ACTUAL	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY2004 ESTIMATE	FY2005 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
(U) O&MN PE# 0708017N	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	Cont	Cont
(U) OPN PE# 0708017N	2,713	13,741	18,369	18,483	7,424	7,103	6,878	5,866	Cont	Cont

(U) RELATED RDT&E: None

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604777N
PROGRAM ELEMENT TITLE: Navigation/ID Systems

D. (U) ACQUISTION STRATEGY: *

	FY 1998	FY 1999	FY 2000	FY 2001
Program Milestones	4Q - MSIIIA	3Q - MSIII	3Q - MSIV	
Engineering Milestones				
T&E Milestones	4Q - OA		2Q - 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 funds to initiate the program and accomplish the milestones prior to FY98.

DATE: February 1999

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604777N
PROGRAM ELEMENT TITLE: Navigation/ID Systems

(U) COST: (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1998 ACTUAL	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY2005 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
X2313 Situational Awareness Beacon with Reply (SABER)	4,610	6,993	3,317	1,147	1,130	1,161	1,189	1,217	cont.	cont.

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 communications technologies. The SABER system consists of a GPS receiver and two-way radio capable of Over-The-Horizon (OTH) and Line-Of-Sight (LOS) secure and non-secure communications, plus a Collection of Broadcast From Remote Assets (COBRA) transmitter. The GPS receiver provides an accurate position of the user which is broadcast over the various RF links for reception by other SABER beacons. When a correctly encoded interrogation signal is received by the SABER, it transmits a reply via the radio of the users identification, position, heading, and speed. The interrogating system can be any member of the user's command and control structure. 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. Three basic configurations will be developed and produced: self-contained (for amphibious forces and ground forces); integrated with NAVSSI(for ships so equipped); integrated with CDNU (in aircraft so equipped).

(U) PROGRAM PLANS AND ACCOMPLISHMENTS:

1. (U) FY 1998 ACCOMPLISHMENTS
   - (U) ($542K) Conduct and support joint exercises utilizing ACTD systems.
   - (U) ($865K) Systems Engineering for studies for shipboard and aircraft integration.
   - (U) ($845K) Procure technical data.
   - (U) ($846K) System engineering analysis, modeling, and simulation of combat and friendly identification concepts.
   - (U) ($149K) Developmental testing of YEAR 2000 and encrypted waveform components.
   - (U) ($1,228K) Fabrication of upgraded ACTD models for exercises and demonstrations.
   - (U) ($135K) 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) ($5,975) Development, fabrication, test, and evaluation of Engineering Development Model(EDM)of SABER stand alone configuration.
- (U) ($85) Systems Engineering for C4ISR integration.
- (U) ($375) System engineering for transition of SABER from ACTD to a formal acquisition program in conformance with DODINST 5000 series.
- (U) ($225) Prototype development and demonstration of integrated SABER/aircraft and shipboard configuration. System engineering analysis of SABER/NAVSSI integration.
- (U) ($333) System engineering management of EDM development and operational testing.

3. (U) FY 2000 PLANS:
- (U) ($289) System engineering analysis for C4ISR integration.
- (U) ($1964) Developmental, qualification, and environmental test of SABER EDM systems.
- (U) ($100) Conduct Operational Test and Evaluation of SABER systems.
- (U) ($964) System engineering and developmental test of prototype integrated SABER/aircraft and shipboard configuration.

B. (U) PROGRAM CHANGE SUMMARY:
(U) FY 1998: Funding change of -$1,131K for SBIR realignment: -$567K for Congressional recession. FY 1999 Funding change of -$25K for revised economic assumptions. FY 2000: Funding change of -$36K for inflation adjustments.

(U) Schedule: FY 1998: Competition for Engineering Development Models and initial production deferred to FY 1999 releasing funds for exercises and demonstrations.

(U) Technical: None.

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604777N
PROGRAM ELEMENT TITLE: Navigation/ID Systems

(U) COST: (Dollars in thousands)

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

	FY 1998 ACTUAL	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
(U) OPN #285100:	0	1,022	4,178	4,336	4,735	3,304	3,373	3,443	CONT.	CONT.
(U) O&MN #AG/SAG 1A4A:	908	970	1,966	3,578	3,923	6,555	6,723	6,898	CONT.	CONT.

D. (U) SCHEDULE PROFILE:

	FY 1998	FY 1999	FY 2000
Program Milestones		2Q-Milestone II	3Q - Milestone III
Engineering Milestones		3Q - PDR	1Q - CDR
T&E Milestones			2Q - FAT 3Q - OPEVAL
Contract Milestones	*3Q-Acquisition Package Comp.	2Q-Contract Award (EMD)	1Q - Contract Award (LRIP)

- 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.

BUDGET ACTIVITY: 5 **PROGRAM ELEMENT: 0604777N** **PROJECT NUMBER: x2313**

Exhibit R-3 Cost Analysis (page 1)												Date: February 1999
FY 1999/ Budget Activity 5			PROGRAM ELEMENT : 0604777N									SABER Project Number:X2313
Cost Categories	Contract Method & Type	Performing Activity & Location	Total Pys Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date			Cost To Complete	Total Cost	Target Value of Contract
ACTD Hardware	CPFF	Southwest Research Inst.-San Antonio TX	1,228								1,795	
Engineering Development Model	CPI	Competitive		5,975	10/98	1,964	10/99			Cont	9,000	
System Engineering	WR	SPAWAR-SYS. CEN. San Diego	1,754	659	10/98	989	10/99			Cont	Cont	
Engineering Services	CPFF	ARINC INC./CSC San Diego	250	100	10/98	100	10/99			Cont	Cont	
Subtotal Product Development			3,232	6,734		3,053				Cont	Cont	
Remarks:												
ACTD Exercise Support	WR	SPAWAR –SYS. CEN. Charleston	700	100							800	
Subtotal Support			700	100							800	
Remarks												

Exhibit R-3 Cost Analysis (page 2)													Date: February 1999
FY 1999 / Budget Activity 5			PROGRAM ELEMENT : 0604777N										SABER Project Number:X2313
Cost Categories	Contract Method & Type	Performing Activity & Location	Total Pys Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date			Cost To Complete	Total Cost	Target Value of Contract
TEMP Development	CPFF	ARINC INC. San Diego	418							Cont	Cont	
Operational Evaluation		OPTEVFOR				100	10/99				100	
Subtotal T&E			418			100				Cont	Cont	
Remarks												
Project Management Support	CPFF	DCS Corp San Diego	350	159	10/98	164	10/99			Cont	Cont	
Subtotal Management			350	159		164				Cont	Cont	
Remarks												
Total Cost			4,610	6,993		3,317				Cont	Cont	
Remarks												

Exhibit R-2 FY 2000 President's Budget RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1999

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 1998 ACTUAL	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
Advanced Deployable System										
X1300	40,095	49,167	14,910	20,933	35,641	33,318	27,145	44,026	54,034	430,115
Total	40,095	49,167	14,910	20,933	35,641	33,318	27,145	44,026	54,034	430,115

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Advanced Deployable System (ADS) is an undersea surveillance system composed of distributed sensors that can be rapidly and unobtrusively deployed in regional contingency areas for use against enemy submarines and in support of littoral warfare. It is designed to detect and track modern diesel electric and nuclear submarines, as well as provide the capability for tracking surface ships and detecting sea minelaying. ADS possesses great flexibility with respect to laydown options, ranging from single barrier to large area fields. It has built upon test experience with distributed sensor fields in shallow noisy water, and used collected data for processing verification. ADS utilizes conventional acoustic sensors and will incorporate All-Optical technology as a secondary developmental effort. ADS incorporates processing technologies and advanced sensors and technologies from other related programs.

1. (U) FY 1998 ACCOMPLISHMENTS:

- (U) ($17,103) Completed assembly and integration of two arrays (nodes) for the Integrated Article Test (IAT). Built, integrated and tested prototype Processing & Analysis Subsystem (PAS) vans for IAT. Conducted Single Node Test (SNT) and IAT. Began assembly and integration of the Multi-Node system for the Multi-Node Test (MNT), incorporating lessons learned from the previous tests. Completed planning for the Fleet Exercise Test (FET). Continued cable survivability and alternative platform deployment capability risk reduction efforts.

- (U) ($626) Completed Early Operational Assessment (EOA) (OT-1A). Initiated detailed planning for the Operational Assessment (OT-1B) in conjunction with the FET.

- (U) ($6,802) Built, integrated and tested Adaptive Beamformer software. Completed analysis of IAT data. Prepared MNT and FET test plan inputs. Initiated and completed ILS planning for MNT and FET tests. Initiated the Common Processor Study to assess current and future PAS alternatives.

Exhibit R-2 FY 2000 President's Budget RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604784N
PROGRAM ELEMENT TITLE: Distributed Surveillance System

PROJECT NUMBER: X1300
PROJECT TITLE: Advanced Deployable System

- (U) ($1,110) Continued to manage ADS program definition and risk reduction through monitoring of contractor and government technical, schedule, and cost performance. Initiated Analysis of Alternatives (AOA) plan development and other MS II program documentation update requirements. Initiated planning for Engineering and Manufacturing Development (EMD) Request for Proposal (RFP) package requirements.

- (U) ($629) Updated Naval Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR) implementation guidance. Updated Naval C4ISR mission to incorporate an overarching operational, systems, technical and information architecture. Conducted associated analyses and studies.

- (U) ($7,360) Testing and packaging of the All-Optical Deployable system into ADS deployment canisters. Conducted design verification tests. Alternative design approaches were explored. Determined deployment platform interface requirements. Determined the interface requirements with the Advanced Deployable System (ADS) Processing and Analysis Segment. Developed comprehensive test plans from the initial Pool Tests through integrated system At-Sea tests. Platform "F" conducted design studies and system architectural tradeoffs for Fit test.

- (U) ($6,465) Developed signal processing and detection algorithms for the ADS. 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) were performed in support of ADS build demonstrations, and fielded testing. Algorithm development was consistent with analysis of requirements, as well as data analysis performed using field data. Efforts were directed to improve the current PAS feature extraction, source set formation, and event detection to support ADS PAS Field Processing performance.

2. (U) FY 1999 PLAN:

- (U) ($22,439) Complete multi-node UWS development, assembly, and integration. Integrate UWS with PAS and conduct test readiness review. Conduct MNT and FET. Analyze MNT and FET data and perform system performance assessment.

- (U) ($4,632) Analyze data collected during MNT and FET and support any additional development and/or operational testing. Conduct Operational Assessment (OT-1B).

- (U) ($12,137) Conduct and complete the AOA. Participate in Navy exercises using ADS arrays to collect target data. Support MNT and FET performance analysis. Develop all ILS products, plans and documents to support Milestone II decision.

Exhibit R-2 FY 2000 President's Budget RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604784N
PROGRAM ELEMENT TITLE: Distributed Surveillance System

PROJECT NUMBER: X1300
PROJECT TITLE: Advanced Deployable System

- (U) ($1,977) Continue to manage ADS program through monitoring of contractor and government technical, schedules, and cost performance. Complete MS II program documentation requirements and conduct MS II review. Prepare and issue EMD Phase RFP.

- (U) ($3,991) Initiate development of data fusion algorithms associated with tracking surface shipping required in ADS's Phase I exit criteria.

- (U) ($3,991) Conduct AODS design verification tests. Conduct design studies and system architectural tradeoffs for advanced remotely-powered AODS variant. Perform feasibility test and in-water demonstration of Platform "F" delivery capability of AODS.

3. (U) FY 2000 PLAN:

- (U) ($10,100) Initiate engineering and manufacturing development. Initiate manufacturing technology /cost reduction engineering analysis and process design for array assembly and integration. Initiate engineering development of installation subsystem. Incorporate lessons learned from FET into PAS.

- (U) ($4,110) Conduct sea tests and system engineering analysis of array design options for P^3I program. Develop ILS products to support system production and fielding.

- (U) ($700) Award EDM contract. Manage ADS through monitoring of contractor and government technical, schedule, and cost performance.

Exhibit R-2 FY 2000 President's Budget RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604784N PROGRAM ELEMENT TITLE: Distributed Surveillance System

PROJECT NUMBER: X1300 PROJECT TITLE: Advanced Deployable System

3. (U) PROGRAM CHANGE SUMMARY:

	FY 1998	FY99	FY00
President's Budget FY99	41,586	42,017	42,920
Adjustments from FY99 PRESBUDG	(1,491)	7,150	(28,010)
President's Budget FY00	40,095	49,167	14,910

(U) Schedule: FY98 reduction due to SBIR and Congressional Undistributed reductions. FY99 increase due to Congressional adds to continue development of All-Optical technology and processing automation. FY00 decrease resulted from program restructuring delaying OPEVAL two years, with procurement delayed from FY03 until FY05.

3. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in Thousands)

	FY 1998 ESTIMATE	FY2005 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
OPN# 2221	N/A	44,506	CONT	CONT

(U) RELATED RDT&E: Not applicable.

Exhibit R-2 FY 2000 President's Budget RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604784N
PROGRAM ELEMENT TITLE: Distributed Surveillance System

PROJECT NUMBER: X1300
PROJECT TITLE: Advanced Deployable System

D. (U) ACQUISTION STRATEGY:

	FY 1998	FY 1999	FY 2000
Program Milestones		MS II 4th Qtr	
Engineering Milestones	ISR 3rd Qtr Complete SNT 2nd Qtr Complete IAT 2nd Qtr	Deliver Prototype 2nd Qtr	
T&E Milestones	Complete EOA (OT-1A) 2nd Qtr	MNT 2nd Qtr FET 2nd-3rd Qtr OT-1B 2nd-3rd Qtr	
Contract Milestones	Start EMD RFP 2nd Qtr	Complete RFP 2nd Qtr	Award EMD Contract

E. (U) SCHEDULE PROFILE:

See paragraph D above.

Exhibit R-3 FY 2000 President's Budget RDT&E,N COST ANALYSIS

DATE: February 1999

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604784N
PROGRAM ELEMENT TITLE: Distributed Surveillance System

PROJECT NUMBER: X1300
PROJECT TITLE: Advanced Deployable System

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

Project Cost Categories	FY 1998	FY 1999	FY 2000
a. Prime Mission Product	17,103	22,439	10,100
b. Program Management	1,110	1,977	700
c. System Engineering /ILS	6,802	12,137	3,310
d. Test & Evaluation	626	4,632	800
e. ADS AODS (X2445)	7,360	3,991	0
f. ADS Algorithm Development (X2446/X1300)	6,465	0	0
g. ADS Automation and Data Fusion (X2652)		3,991	
h. C4ISR Mission Requirements	629	0	0
Total	40,095	49,167	14,910

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

Exhibit R-3 Cost Analysis (Page 1)

APPROPRIATION/BUDGET ACTIVITY: RDT&E,N / BA 5 | **PROGRAM ELEMENT: 0604784N**

Cost Categories	Contract Method & Type	Performing Activity & Location	Total FY98 & Prior Cost	FY99 Cost	Award Date	FY2000 Cost	Award Date	Cost To Complete	Total Cost	Target Value of Contract
Prime Mission Product Development	C/CPAF	LMFS Manassas, VA	52,880	20,629	9/95				73,509	73,509
Prime Mission Product Development	C/CPAF	TBD				5,000	11/99	61,000	66,000	66,000
Government Engineering Support	WX	SSC-San Diego San Diego, CA	21,000	4,136	10/98	1,800	10/99	11,200	38,136	
Engineering Supt Services	C/CPFF	AHA Rockville, MD	2,000	900	10/98				2,900	2,900
Engineering Supt Services	SS/CPFF	APL/JHU Laurel, MD	2,455	1,050	10/97				3,505	3,505
Engineering Supt Services	SS/CPFF	ARL/UT Austin, TX	3,548	1,300	10/98	900	10/99	5,200	10,948	10,948
Software Development	C/CPFF	DSR Fairfax, VA	2,050	1,500	10/98				3,550	3,550
Software Development		TBD				2,500	11/99	30,700	33,200	35,700
OTHER CONTRACTS			5,613	5,972	[1]	300	[1]	1,400	13,285	[1]
OTHER ACTIVITIES			14,277	5,667	10/98	2,710	10/99	38,763	61,417	
Subtotal Product Development			103,823	41,154		13,210		148,263	306,450	

Remarks:

1) Various contracts with different award dates and total cost values.

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

Exhibit R-3 Cost Analysis (Page 2)										
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N / BA 5			PROGRAM ELEMENT: 0604784N							
Cost Categories	**Contract Method & Type**	**Performing Activity & Location**	**Total FY98 & Prior Cost**	**FY99 Cost**	**Award Date**	**FY2000 Cost**	**Award Date**	**Cost To Complete**	**Total Cost**	**Target Value of Contract**
Contractor Engineering Support	C/CPFF	AMRON San Diego, CA	1,417	470	9/98				1,887	8,233
Government Engineering Support	WX	SSC-San Diego San Diego, CA	6,174	550	10/98				6,724	
		OTHER CONTRACTS	11,592	385	[1]	300	[1]	2,200	14,477	[1]
		OTHER ACTIVITIES	353	460	10/98	100	[1]	28,117	29,030	
Subtotal Support			19,536	1,865		400		30,317	52,118	

Remarks:
1) Various contracts with different award dates and total cost values.

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

Exhibit R-3 Cost Analysis (Page 3)										
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N / BA 5			PROGRAM ELEMENT: 0604784N							
Cost Categories	**Contract Method & Type**	**Performing Activity & Location**	**Total FY98 & Prior Cost**	**FY99 Cost**	**Award Date**	**FY2000 Cost**	**Award Date**	**Cost To Complete**	**Total Cost**	**Target Value of Contract**
Developmental Test and Evaluation		OTHER CONTRACTS	6,233	811	[1]		[1]	500	7,544	[1]
Developmental and Operational Test and Evaluation	WX	SSC-San Diego San Diego, CA	7,291	2,996	10/98	600	10/99	400	11,287	
Developmental and Operational Test and Evaluation		OTHER ACTIVITIES	3,871	826	10/98			3,300	7,997	
Subtotal T&E			17,395	4,633		600		4,200	26,828	

Remarks:
1) Various contracts with different award dates and total cost values.

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

Exhibit R-3 Cost Analysis (Page 4)										
APPROPRIATION/BUDGET ACTIVITY: RDT&E,N / BA 5			PROGRAM ELEMENT: 0604784N							
Cost Categories	**Contract Method & Type**	**Performing Activity & Location**	**Total FY98 & Prior Cost**	**FY99 Cost**	**Award Date**	**FY2000 Cost**	**Award Date**	**Cost To Complete**	**Total Cost**	**Target Value of Contract**
Program Management Support	C/CPFF	AMRON San Diego, CA	4,407	870	9/98				5,277	8,233
Program Management Support		OTHER CONTRACTS	4,689	220	[1]	600	[1]	4,200	9,709	[1]
Program Management Support		OTHER ACTIVITIES	1,091	425	10/98	100	[1]	28,117	29,733	[1]
Subtotal Management			10,187	1,515		700		32,317	44,719	
Total Cost			150,701	49,167		14,910		215,097	430,115	

Remarks:
1) Various contracts with different award dates and total cost values.

Exhibit R-2, RDT&E Budget Item Justification	Date: February 1999
APPROPRIATION/BUDGET ACTIVITY: RDT&E/5	R-1 ITEM NOMENCLATURE Commercial Operating and Support Savings Initiative 0604805N

COST ($ in Millions)	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Total P.E. Cost	0	16,462	18,729	19,612	18,805	19,450	20,368	21,193	CONT.	CONT.
COSSI/S2458	0	16,462	18,729	19,612	18,805	19,450	20,368	21,193	CONT.	CONT.
Quantity of RDT&E Articles and cost										

A. Mission Description and Budget Item Justification: The Commercial Operations and Support Savings Initiative (COSSI) program was created by Congress and DOD to fund industry proposals to insert commercial technology into military systems that are experiencing increasing operating and support (O&S) costs, due to aging technology. In FY97 and 98, the program was administered by DOD through DARPA, which had set up the Joint Dual Use Project Office (JDUPO) to manage the COSSI program. There is no FY98 funding, but the figures noted above for FY99 and above were provided to Navy, as DOD is delegating the program budgeting and management to each service from FY99 on. These funds will be used to fund projects in all SYSCOMs and the Marine Corps, after the projects are chosen in the second quarter of FY99.

1. (U) FY 1998 PROGRAM ACCOMPLISHMENTS:

- No funds were provided for FY 1998.

2. (U) FY 1999 PLAN:

- ($16,047) Funds will be distributed to Navy/Marine Corps program managers of the projects that have been ranked highest by a review team. Some possible projects to be funded include: a newLSD 41/49 propeller, a T-45 jet trainer display processor, and a new microwave based tank gauge system.

- ($.415) Portion of extramural program is reserved for Small Business Innovation Research assessment in accordance with 15 USC 638.

3. (U) FY 2000 PLAN:

- ($18,729) Funds will be distributed to Navy/Marine Corps program managers of the projects that are ranked highest by a review team.

4. (U) FY 2001 PLAN:

- ($19,612) Funds will be distributed to Navy/Marine Corps program managers of the projects that are ranked highest by a review team.

B. Program Change Summary:

Exhibit R-2, RDT&E Budget Item Justification	Date: February 1999
APPROPRIATION/BUDGET ACTIVITY: RDT&E/5	R-1 ITEM NOMENCLATURE Commercial Operating and Support Savings Initiative 0604805N

	FY 1998	FY 1999	FY 2000
(U)FY 1999 President's Budget:	0	28.5	31.8
(U)Appropriated Value:	0	16.5	
(U)Adjustments to FY 1998 Appropriated Value/ FY 1999 President's Budget:			
a. Outsourcing		0	.29
b. Reduce RDT&E		0	12.51
c. Sec 8108		.38	0
d. FY99 Cong. Cut		12.0	0
e. PBD 604		0	.271
FY 2000/01 PRES Budget Submit:	0	16.5	18.73

Funding: Funding reduced in FY2000 and FY2001 to reflect projected Congressional program reductions.

Schedule: Unknown until 2nd qtr, FY99.

Technical: Unknown until 2nd qtr, FY99.

C. Other Program Funding Summary: Not Applicable

Related RDT&E: OSD PE 0603805E Commercial Operations and Support Savings Initiative (COSSI)

D. Acquisition Strategy: A formal solicitation was sent to all interested contractors via a Broad Area Announcement (BAA) in early October, 1998. The prospective vendors submitted their proposals 45 days later (15 Nov) and a selection panel convened on Jan 4-7, 1999 to choose which proposals will be funded. These recommendations will be approved by CNO(N4), and funds will be distributed to the winning program managers sponsoring the projects by the middle of February, 1999. Each program manager must have their project's stage I under contract by the end of FY99, using the Other Transactions for Prototypes (OT) method of contracting.

E. Schedule Profile: 1Oct 1998-issue solicitation. 9 December1998-receive proposals. 4-7 Jan 1999, rate and rank proposals. 15 January 1999-obtain OPNAV approval for recommended projects. 15 Feb 1999-distribute funds to program managers. 15 Feb-30 Sept 1999-place stage I (development) of projects under contract.

Exhibit R-3 Cost Analysis		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY: RDT&E/5	Commercial Operations and Support Savings Initiative 0604805N	Commercial Operations and Support Savings Initiative(COSSI) S2458

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date	FY01 Cost	FY01 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development												
Ancillary Hardware Development												
Systems Engineering												
Licenses												
Tooling												
GFE												
Award Fees												
Subtotal Product Development												
Remarks: These details are not known at this time.												
Development Support Equipment												
Software Development												
Training Development												
Integrated Logistics Support												
Configuration Management												
Technical Data												
GFE												
Subtotal Support												
Remarks: These details are not known at this time.												

Exhibit R-3 Cost Analysis		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY: RDT&E/5	Commercial Operations and Support Savings Initiative 0604805N	Commercial Operations and Support Savings Initiative(COSSI) S2458

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date	FY01 Cost	FY01 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation												
Operational Test & Evaluation												
Tooling												
GFE												
Subtotal T&E												
Remarks: These details are not known at this time.												
Contractor Engineering Support												
Government Engineering Support												
Program Management Support												
Program Management Personnel												
Travel												
Labor (Research Personnel)												
Overhead												
Subtotal Management												
Remarks: These details are not known at this time.												
Total Cost				16.5		18.7		19.60		CONT.	CONT.	CONT.
Remarks: Level of detail needed for the R3 will be available by March 1999.												