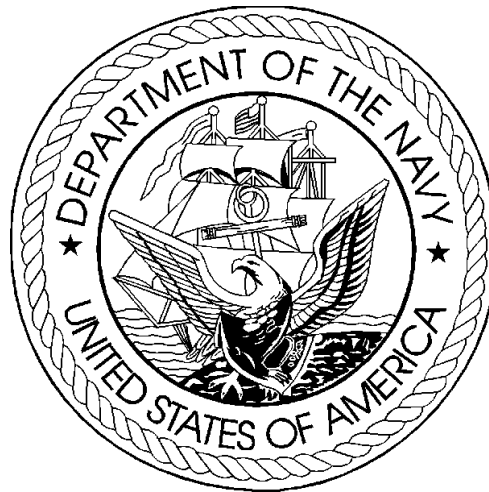


DEPARTMENT OF THE NAVY  
FY 1999 AMENDED BUDGET ESTIMATES



JUSTIFICATION OF ESTIMATES  
FEBRUARY 1998

RESEARCH, DEVELOPMENT, TEST &  
EVALUATION, NAVY  
BUDGET ACTIVITY 7

UNCLASSIFIED

Department of the Navy  
FY 1999 RDT&E Program

Exhibit R-1

APPROPRIATION: 1319n Research, Development, Test and Evaluation, Navy DATE: February 1998

DoD R-1 Line Number	DON R-1 Line Number	Program Element Number	Item Nomenclature	Millions of Dollars			Security Classification	
				Budget Activity	FY 1997	FY 1998		FY 1999
150	186	0604227N	Harpoon Modifications	7	0.000	0.000	1.965	
151	150	0101221N	Strategic Sub & Weapons System Support	7	29.922	39.101	56.604	U
152	151	0101224N	SSBN Security/Survivability Program (R2/R3 Materials provided in Classified Budget Book)	7	22.657	23.856	33.588	U
153	152	0101226N	Sub Acoustic Warfare Dev	7	7.391	5.800	8.328	U
154	153	0204136N	F/A-18 Squadrons	7	402.816	310.824	357.214	U
155	154	0204152N	E-2 Squadrons	7	60.012	62.530	47.797	U
156	155	0204163N	Fleet Communications	7	17.623	15.961	16.297	U
157	156	0204229N	Tomahawk & T MPC	7	138.809	88.760	66.727	U
158	157	0204311N	Integrated Surveillance System	7	33.126	9.573	19.772	U
159	158	0204413N	Amphib Tactical Support Units	7	1.231	0.645	1.945	U
160	159	0204571N	Consolidated Training Systems Development	7	43.192	66.661	28.390	U
161	160	0204575N	EW Readiness Support	7	1.240	1.578	3.716	U
162	161	0205601N	HARM Improvement	7	35.783	39.913	18.921	U
163	162	0205604N	Tactical Data Links	7	34.695	39.934	49.757	U
164	163	0205620N	Surface ASW Combat Sys Integration	7	6.412	7.560	9.390	U
165	164	0205632N	MK 48 ADCAP	7	10.491	10.451	17.550	U
166	165	0205633N	Aviation Improvements	7	50.794	49.307	64.956	U
167	166	0205658N	Navy Science Assistance Program (Merged with PE 0603238N, R-1 Line Item No. 18, Precision Strike and Air Defense Technology)	7	15.534	-	-	U
168	167	0205667N	F-14 Upgrade	7	9.377	11.289	12.947	U
169	168	0205675N	Operational Nuclear Power Systems (R2/R3 Materials provided in Classified Budget Book)	7	54.894	54.337	54.183	U
170	169	0206313M	Marine Corps Communications	7	53.960	40.840	50.594	U
171	170	0206623M	MC Ground Combat/Spt Arms Sys	7	9.557	13.699	14.699	U
172	171	0206624M	MC Combat Services Support	7	7.993	4.857	4.634	U
173	172	0207161N	Tactical Air Intercept	7	45.319	57.946	65.855	U
174	173	0207163N	AMRAAM	7	2.128	5.479	4.862	U
175	174	0303906N	Aquarius (Classified -- Material Not Available)	7	-	-	-	U
176	175	0303901N	Sirius (Classified -- Material Not Available)	7	-	-	-	U
177	176	0303109N	Satellite Communications (Space)	7	32.000	16.256	18.188	U
178	177	0303140N	Information Systems Security Plan	7	22.388	16.773	22.201	U
179	178	0303150N	Global Command and Control	7	-	0.484	0.469	U
180	179	0303905N	Pisces (Classified -- Material Not Available)	7	-	-	-	U
181	180	0303907N	Capricorn (Classified -- Material Not Available)	7	-	-	-	U
182	181	0305160N	Def Meteorological Satellite Prog (Space)	7	16.735	4.753	11.671	U
183	182	0305188N	Joint (C4ISR) Battle Center	7	0.000	0.000	5.352	
184	183	0305192N	Joint Military Intelligence Program (Classified -- Material Not Available)	7	-	2.341	2.302	U
185	184	0305207N	DARP, Special Project Aircraft (Classified -- Material Not Available)	7	-	0.344	0.342	U
186	185	0305927N	Navy Space Surv	7	0.659	0.387	0.399	U
187	187	0702207N	Depot Maintenance	7	0.000	0.000	69.967	
188	188	0708011N	Industrial Preparedness	7	84.237	53.369	59.060	U
Total Operational Systems Development					1,250.975	1,055.608	1,200.642	

UNCLASSIFIED

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

Exhibit R-1

APPROPRIATION: 1319n Research, Development, Test and Evaluation, Navy DATE: February 1998

				Millions of Dollars				
DoD	DON	Program		Budget				Security
R-1	R-1	Element		Activity	FY 1997	FY 1998	FY 1999	Classification
Line Number	Line Number	Number	Item Nomenclature					
159	158	0204413N	Amphib Tactical Support Units	7	1.231	0.645	1.945	U
174	173	0207163N	AMRAAM	7	2.128	5.479	4.862	U
175	174	0303906N	Aquarius	7	-	-	-	U
			(Classified -- Material Not Available)					
166	165	0205633N	Aviation Improvements	7	50.794	49.307	64.956	U
181	180	0303907N	Capricorn	7	-	-	-	U
			(Classified -- Material Not Available)					
160	159	0204571N	Consolidated Training Systems Development	7	43.192	66.661	28.390	U
185		0305207N	DARP, Special Project Aircraft	7	-	0.344	0.342	U
			(Classified -- Material Not Available)					
182	184	0305160N	Def Meteorological Satellite Prog (Space)	7	16.735	4.753	11.671	U
187	187	0702207N	Depot Maintenance	7	0.000	0.000	69.967	U
155	154	0204152N	E-2 Squadrons	7	60.012	62.530	47.797	U
161	160	0204575N	EW Readiness Support	7	1.240	1.578	3.716	U
168	167	0205667N	F-14 Upgrade	7	9.377	11.289	12.947	U
154	153	0204136N	F/A-18 Squadrons	7	402.816	310.824	357.214	U
156	155	0204163N	Fleet Communications	7	17.623	15.961	16.297	U
179	178	0303150N	Global Command and Control	7	-	0.484	0.469	U
162	161	0205601N	HARM Improvement	7	35.783	39.913	18.921	U
150	186	0604227N	Harpoon Modifications	7	0.000	0.000	1.965	U
188	188	0708011N	Industrial Preparedness	7	84.237	53.369	59.060	U
178	177	0303140N	Information Systems Security Plan	7	22.388	16.773	22.201	U
158	157	0204311N	Integrated Surveillance System	7	33.126	9.573	19.772	U
183	182	0305188N	Joint (C4ISR) Battle Center	7	0.000	0.000	5.352	U
184	183	0305192N	Joint Military Intelligence Program	7	-	2.341	2.302	U
			(Classified -- Material Not Available)					
170	169	0206313M	Marine Corps Communications	7	53.960	40.840	50.594	U
172	171	0206624M	MC Combat Services Support	7	7.993	4.857	4.634	U
171	170	0206623M	MC Ground Combat/Spt Arms Sys	7	9.557	13.699	14.699	U
165	164	0205632N	MK 48 ADCAP	7	10.491	10.451	17.550	U
167	166	0205658N	Navy Science Assistance Program	7	15.534	-	-	U
			(Merged with PE 0603238N, R-1 Line Item No. 18, Precision Strike and Air Defense Technology)					
186	185	0305927N	Navy Space Surv	7	0.659	0.387	0.399	U
169	168	0205675N	Operational Nuclear Power Systems	7	54.894	54.337	54.183	U
			(R2/R3 Materials provided in Classified Budget Book)					
180	179	0303905N	Pisces	7	-	-	-	U
			(Classified -- Material Not Available)					
177	176	0303109N	Satellite Communications (Space)	7	32.000	16.256	18.188	U
176	175	0303901N	Sirius	7	-	-	-	U
			(Classified -- Material Not Available)					
152	151	0101224N	SSBN Security/Survivability Program	7	22.657	23.856	33.588	U
			(R2/R3 Materials provided in Classified Budget Book)					
151	150	0101221N	Strategic Sub & Weapons System Support	7	29.922	39.101	56.604	U
153	152	0101226N	Sub Acoustic Warfare Dev	7	7.391	5.800	8.328	U
164	163	0205620N	Surface ASW Combat Sys Integration	7	6.412	7.560	9.390	U
173	172	0207161N	Tactical Air Intercept	7	45.319	57.946	65.855	U
163	162	0205604N	Tactical Data Links	7	34.695	39.934	49.757	U
157	156	0204229N	Tomahawk & TMPC	7	138.809	88.760	66.727	U
Total Operational Systems Development					1,250.975	1,055.608	1,200.642	

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

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

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

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

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

Identification code	17-1319-0-1-051	1997 actual	1998 est.	1999 est.
-----				
Direct obligations:				
Personnel compensation:				
111.101	Full-time permanent	43,779	44,428	43,112
111.301	Other than full-time permanent	2,923	2,625	2,469
111.501	Other personnel compensation	1,494	1,563	1,527
111.801	Special personal services payments	27	27	28
		-----	-----	-----
111.901	Total personnel compensation	48,223	48,643	47,136
112.101	Personnel Benefits: Civilian personnel	10,194	10,653	10,207
113.001	Benefits for former personnel	522	484	441
121.001	Travel and transportation of persons	27,419	27,995	28,583
122.001	Transportation of things	544	556	567
123.201	Rental payments to others	3,256	3,324	3,394
123.301	Communications, utilities, and miscellaneous charges	4,895	4,998	5,103
124.001	Printing and reproduction	391	399	408
125.101	Advisory and assistance services	247,090	223,455	225,165
125.201	Other services with the private sector	11,212	235,465	95,918
Purchases goods/services (inter/intra) Fed accounts				
125.301	Purchase of goods/services from other Fed agencies	650,577	664,239	678,188
125.303	Purchases from revolving funds	2,385,085	2,077,579	2,183,869
125.401	Contract O&M of facilities including GOCOS	168	172	176
125.501	Research & Development Contracts	4,622,015	4,552,040	4,794,605
125.701	Contract O&M of equip. including ADP hard/software	1,706	1,742	1,779
126.001	Supplies and materials	7,767	7,930	8,097
131.001	Equipment	10,693	10,918	11,147
132.001	Land and structures	384	392	400
		-----	-----	-----
199.001	Total Direct obligations	8,032,141	7,870,984	8,095,183
Reimbursable obligations:				
Personnel Compensation:				
211.101	Full-time permanent	36,444	40,327	41,966
211.301	Other than full-time permanent	2,440	2,534	2,553
211.501	Other personnel compensation	977	899	937
		-----	-----	-----
211.901	Total personnel compensation	39,861	43,760	45,456
212.101	Personnel Benefits: Civilian Personnel	7,611	8,554	8,801
213.001	Benefits for former personnel	15		
221.001	Travel and transportation of persons	4,248	4,300	4,350
222.001	Transportation of things	227	240	251
223.201	Rental payments to others	1,647	1,702	1,735
223.301	Communications, utilities, and miscellaneous charges	1,826	1,880	1,890
224.001	Printing and reproduction	269	280	291

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

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

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

(\$ in Thousands)

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

Explanation of Changes in Financing  
(\$ in Thousands)

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

1. Program Requirements (Total). There has been a net increase to the appropriation (adjusted) of +\$28,063, as a result of changes in program requirements as noted below.
  
2. Program Requirements (Service Account). There has been a net increase to the appropriation (adjusted) of +\$28,607. These changes included: a rescission to the FY 1997 program approved in the FY 1998 DoD Appropriations Act (-\$40,000); an Emergency Supplemental Appropriation based on reduced inflation rates to finance Bosnia contingency costs (-\$9,600); reductions reflected on the FY 1997 DoD Omnibus Reprogramming Action to specific programs (-\$1,232); reductions to finance Military Personnel, Navy (MPN) shortfalls (-\$10,270); and three transfers into the appropriation from a DoD central transfer account to support the RDT&E Counter Drug program (+\$23,774). Additionally, a number of Internal Reprogrammings were effected which reclassified funding between DoD and DoN appropriations to more properly align it into the correct programs for execution: (1) V-22 EMD (\$68,400--from APN); (2) Defense Finance and Accounting Service (DFAS)(\$9,240--from O&MN); (3) Large Area Tracking Radar (LATR) (-\$4,226--to OPN); (4) F-14 TARPS (+\$4,887--from APN); (5) Environmental Test Bed (+\$3,813--from Army); (6) Southeast Regional Network (SRN)(-\$2,300--to O&MN); (7) DDG-51 TBMD/CEC (-\$13,879).
  
3. Program Requirements (Reimbursable). There has been a net decrease to the appropriation of -\$544, as a result of changes in reimbursable program requirements (-\$544).



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

Summary of Requirements (\$ In Thousands)

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

Explanation by Budget Activity  
(\$ In Thousands)

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

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

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

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

(\$ In Thousands)

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

Explanation of Changes in Financing  
(\$ in Thousands)

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

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

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

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

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

Summary of Requirements (\$ in Thousands)

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

Explanation by Budget Activity  
(\$ in Thousands)

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

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

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

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

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

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

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

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

# UNCLASSIFIED

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

Date: Feb 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0101221N

PROGRAM ELEMENT TITLE: Strategic Submarine & Weapons System Support

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
J0951 TRIDENT II	6,658	10,667	9,993	9,135	7,541	7,755	1,443	CONT.	CONT.
S0004 TRIDENT Submarine System Improvement	1,548	4,589	7,414	2,202	0	1,492	1,512	CONT.	CONT.
J2228 Technology Applications Program	21,716	23,845	39,197	38,185	40,340	41,257	42,297	CONT.	CONT.
TOTAL	29,922	39,101	56,604	49,522	47,881	51,504	45,252	CONT.	CONT.

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The TRIDENT II (D5) Submarine Launched Ballistic Missile (SLBM) provides the U.S. a weapon system with greater accuracy and payload capability as compared to the TRIDENT I (C4) system. TRIDENT II enhances U.S. strategic deterrence providing a survivable sea-based system capable of engaging the full spectrum of potential targets with fewer submarines. This PE supports continued evaluation of the system's long range performance and capabilities as well as investigations into new technologies which would help mitigate the program impact due to component obsolescence and a rapidly decreasing manufacturing support base. Efforts also include Reentry System and Guidance Applications efforts. The TRIDENT Submarine System Improvement Program develops and integrates command and control improvements needed to maintain TRIDENT submarine operational capability through the life cycle of this vital strategic asset. The program conducts efforts needed to maintain strategic connectivity, ensure platform invulnerability, and reduce life cycle costs through Obsolete Equipment Replacement (OER) and commonality.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it encompasses engineering and manufacturing development for upgrade of existing, operational systems.

R-1 Line Item 150

Budget Item Justification  
(Exhibit R-2, page 1 of 21)

# UNCLASSIFIED



# UNCLASSIFIED

## FY 1999 PROGRAM ELEMENTS/PROJECT COST BREAKDOWN

Date: Feb 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0101221N

PROGRAM ELEMENT TITLE: Strategic Submarine &  
Weapon Systems Support

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUALS	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
J0951 TRIDENT II	6,658	10,667	9,993	9,135	7,541	7,755	1,443	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The TRIDENT II (D5) Submarine Launched Ballistic Missile (SLBM) provides the U.S. a weapon system with greater accuracy and payload capability as compared to the TRIDENT I (C4) system. TRIDENT II enhances U.S. strategic deterrence by providing a survivable sea-based system capable of engaging the full spectrum of potential targets with fewer submarines. This project supports continued evaluation of the system's long range performance and capabilities as well as investigations into new technologies which would help mitigate the program impact due to component obsolescence and a rapidly decreasing manufacturing support base.

R-1 Line Item 150

Budget Item Justification  
(Exhibit R-2, page 2 of 21)

# UNCLASSIFIED

# UNCLASSIFIED

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

Date: Feb 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0101221N

PROJECT NUMBER: J0951

PROGRAM ELEMENT TITLE: Strategic Submarine &  
Weapon Systems Support

PROJECT TITLE: TRIDENT II

## (U) PROGRAM ACCOMPLISHMENTS AND PLANS

### 1. (U) FY 1997 PLAN:

- (U) (\$6,658) SRS: Effort continued in support of phase three development of the SLBM Retargeting System.

### 2. (U) FY 1998 PLAN:

- (U) (\$9,000) SRS: Effort continues in support of phase three development of the SLBM Retargeting System. Full obligation is projected by 3<sup>rd</sup> quarter of the 1<sup>st</sup> year.
- (U) (\$1,667) TRIDENT COST OF OWNERSHIP REDUCTION INITIATIVES: Full obligation is projected by 3<sup>rd</sup> quarter of the 1<sup>st</sup> year.
  - (U) Complete Integrated Design and Manufacturing Project.
  - (U) Complete advanced Non-Destructive Test development efforts.
  - (U) Complete the Reduced Cost/Improved Manufacturing Concepts project.

### 3. (U) FY 1999 PLAN:

- (U) (\$9,178) SRS: Effort continues in support of phase three development of the SLBM Retargeting System. Full obligation is projected by 3<sup>rd</sup> quarter of 1<sup>st</sup> year.
- (U) (\$ 815) This represents funding utilized to finance closed account contract billings.

R-1 Line Item 150

Budget Item Justification  
(Exhibit R-2, page 3 of 21)

# UNCLASSIFIED

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

Date: Feb 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0101221N  
 PROGRAM ELEMENT TITLE: Strategic Submarine &  
 Weapon Systems Support

PROJECT NUMBER: J0951  
 PROJECT TITLE: TRIDENT II

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget	12,333	10,993	9,178
(U) Appropriated value:	12,333	10,993	9,178
(U) Adjustments to FY 1997 Appropriated Value/PRESIDENTS BUDGET	(-)5,675	(-)326	815
(U) FY 1999 PRESBUDG submit	6,658	10,667	9,993

(U) CHANGE SUMMARY EXPLANATION: FY 1997 changes result from miscellaneous pricing adjustments (\$-687), and internal Navy reprogrammings, including funds required to pay closed account bills (\$-4988). Funds were available due to the partial financing of FY 1997 requirements with FY 1996 funds, reflecting a one-time funding correction for delayed expenditures. FY 1998 decrease results from various Congressional adjustments. FY 1999 increase is required for higher than anticipated Closed Account Bills (\$+1,000), partially offset by miscellaneous pricing adjustments (\$-185).

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

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

FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

(U) RELATED RDT&E: N/A

D. (U) SCHEDULE PROFILE: Not Applicable.

R-1 Line Item 150

Budget Item Justification  
 (Exhibit R-2, page 4 of 21)

# UNCLASSIFIED

# UNCLASSIFIED

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

DATE: Feb 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0101221N

PROJECT NUMBER: J0951

PROGRAM ELEMENT TITLE: Strategic Submarine and  
Weapon System Support

PROJECT TITLE: TRIDENT II

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

Project Cost Categories

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Strategic Retargeting System	6,658	9,000	9,178
b. TRIDENT Cost of Ownership Initiative	0	1,667	0
c. Closed Account Contract Billings	0	0	815 *
Total	6,658	10,667	9,993

\* This will migrate to the closed account line item as have FY 1997 and FY 1998 funds

R-1 Line Item 150

Budget Item Justification  
(Exhibit R-2, page 5 of 21)

# UNCLASSIFIED

# UNCLASSIFIED

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

Date: Feb 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0101221N

PROJECT NUMBER: J0951

PROGRAM ELEMENT TITLE: Strategic Submarine and  
Weapon System Support

PROJECT TITLE: TRIDENT II

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

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development										
LMDS	SS/CPFF	10/95	3,400	3,400	3,400				0	3,400
LMDS	SS/CPFF	10/96	3,247	3,247		3,247			0	3,247
LMMS	SS/CPFF	2/96	4,954	4,954	4,954				0	4,954
LMDS	SS/CPFF	10/97	3,600	3,600			3,600		0	3,600
LMDS	SS/CPFF	10/98	3,700	3,700				3,700	0	3,700
LMMS	SS/CPFF	10/97	1,993	1,667			1,667		0	1,667
GDEB	SS/CPFF	3/95	1,428	1,428	1,428				0	1,428

R-1 Line Item 150

Budget Item Justification  
(Exhibit R-2, page 6 of 21)

# UNCLASSIFIED

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

Date: Feb 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0101221N

PROJECT NUMBER: J0951

PROGRAM ELEMENT TITLE: Strategic Submarine and  
Weapon System Support

PROJECT TITLE: TRIDENT II

GOVERNMENT FURNISHED PROPERTY

<u>Item Description</u>	<u>Contract Method/ Fund Type Vehicle</u>	<u>Award/ Oblig Date</u>	<u>Total Delivery Date</u>	<u>FY 1996 &amp; Prior</u>	<u>FY 1997 Budget</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Product Development *									
NSWC	WR	10/95	10/95	5,500				0	5,500
NSWC**	WR	10/96	10/96	2,100				0	2,100
NSWC	WR	10/96	10/96		3,411			0	3,411
NSWC	WR	10/97	10/97			5,400		0	5,400
NSWC	WR	10/98	10/98				5,478	0	5,478
SPBH	PD	10/98	10/98				815	0	815
Support and Management									
Test and Evaluation									
Total									

\*\* \$2.1 Million deferred until 1 Oct 96 (FY97)

R-1 Line Item 150

Budget Item Justification  
(Exhibit R-2, page 7 of 21)

# UNCLASSIFIED

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

Date: Feb 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0101221N  
PROGRAM ELEMENT TITLE: Strategic Submarine and  
Weapon Systems Support

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL TITLE PROGRAM
J2228 Technology Applications Program	21,716	23,845	39,197	38,185	40,340	41,257	42,297	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This supports implementation of a coordinated Air Force/Navy Reentry System Applications Program as well as the implementation of a Strategic Guidance Applications Program. Reentry Vehicle and Guidance Technology is rapidly eroding beyond the point of being capable to respond to increasing aging phenomena and future requirements. The Nuclear Posture Review examined the infrastructure which supports the nuclear force structure. It concluded that special actions were required to correct the rapidly eroding capability to maintain confidence in the existing weapon systems, and recommended that the reentry vehicle and guidance technology bases should be preserved. That recommendation resulted in the Presidential Decision Directive-30, which directed that programs be established for the reentry vehicle and guidance technology application.

- Through sustainment of the Reentry Vehicle Technology Base, confidence in the dependability and reliability of Strategic SLBM and ICBM weapon systems will be maintained over the long term when no new systems will be in development. Critical and unique attributes necessary for the design, development and in-service support of current and modernized SLBM Reentry Systems will be defined and maintained to insure a functioning readiness application technical capability in reentry is preserved. Working closely with the Air Force, Navy requirements will be integrated with the Air Force requirements into a comprehensive program. The Program will maintain close coordination with the DOD Science and Technology (S&T) Community through the Reliance process in order to: leverage S&T programs, ensure system driven technology base requirements are considered in contract awards, eliminate duplication of effort and provide an opportunity to demonstrate appropriate emerging technologies through a reentry flight test evaluation process.
- This Program provides a minimum Strategic Guidance core technology development capability consistent with the Strategic Advisory Group (SAG) recommendations to CINCSTRAT. In the SAG recommendations SSP is to establish a program which preserves this critical design and development core. It is a basic bridge program which develops critical guidance technology applicable to any of the existing Air Force/Navy Strategic Missiles. The objective is to transition from current capability to a long term readiness status required to support deployed systems. Air Force and Navy guidance technology requirements shall be integrated and needs prioritized. Efforts shall be focused on alternatives to currently utilized technologies identified as system "weak links". Current system accuracy and functionality depends upon key technologies which provide radiation hardened velocity, attitude and stellar sensing capabilities. As the underlying technologies that currently provide these capabilities age and are no longer technically supportable modern alternatives must be made available in order to allow for orderly replacement. There is no commercial market for these technologies and their viability depends on the Strategic community. This technology development activity provides the necessary technical challenges which insures the availability of a proficient team of technical experts. The availability and maintenance of these skills and experience of these experts are crucial to the support of the nation's Strategic Guidance Systems.

R-1 Line Item 150

Budget Item Justification  
(Exhibit R-2, page 8 of 21)

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# UNCLASSIFIED

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

Date: Feb 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0101221N  
PROGRAM ELEMENT TITLE: Strategic Submarine and  
Weapon Systems Support

PROJECT NUMBER: J2228  
PROJECT TITLE:  
Technology  
Applications

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 PLAN:

(U) (\$12,305) Continued Reentry System Applications Program. FY 1997 efforts included:

- (U) Selected and prepared flight test on-board instrumentation for measurement of nosetip recession.
- (U) Manufacture selected ground test nosetip and heatshield replacement material specimens.
- (U) Updated the readiness application assessment and state-of-the art technology survey completed in FY 1995. Results will be used to modify the technical program plan as appropriate.
- (U) Evaluated reentry vehicle ground test and flight test data for aging related trends.
- (U) Defined and tested instrumentation to support reentry vehicle service life extension and accuracy maintenance assessment
- (U) Continued tasks initiated in FY 1996 in response to the results of the readiness application assessment.
- (U) Continued concept formulation, trade studies, and requirements definition to evaluate material concepts for reentry vehicle design applications and instrumentation concepts for on-board flight measurements. Maintain the technical program plan.

(U) (\$ 9,411) Continued Strategic Guidance Applications Program. FY 1997 efforts included:

- (U) Adapted and enhanced the current Guidance Modeling and Simulation (Integrated Engineering Environment-IEE) by completing functional subsystem models including "discipline specific" design tools. Utilize the IEE to support design of the velocity model under the Strategic Inertial Guidance Hardware Technology Synthesizer (SIGHTS), previously referred to as "testbed", which will be used as a proof of concept and initial hardware correlation of the IEE. One of the evaluation tools developed under SIGHTS will be a set of "probes" delivered in FY 1998 for better diagnostic evaluation of the TRIDENT D-5 guidance system. The velocity module effort will require and include power and timing functions. As part of the proof of concept demonstration, multiple accelerometers will be used in the velocity module (10 PIGA and 16 PIGA).
- (U) Continued accelerometer trade off studies and initiate prototype design of next generation PIGA. Complete evaluation of gyro "slider" bearing technology and radiation hardening studies/testing of Inteferometric Fiber Optic Gyro (IFOGs). Perform evaluation of alternate stellar sensors, English Electric Valve Charge Coupled Device (CCD) and Photobit Active Pixel Sensor. Continue the Radiation Hardened Electronics effort associated with alternate design approaches of using either low voltage analog and or digital parts to replace high voltage analog parts in conventional designs.

R-1 Line Item 150

Budget Item Justification  
(Exhibit R-2, page 9 of 21)

# UNCLASSIFIED



# UNCLASSIFIED

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

Date: Feb 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0101221N  
PROGRAM ELEMENT TITLE: Strategic Submarine and  
Weapon Systems Support

PROJECT NUMBER: J2228  
PROJECT TITLE:  
Technology  
Applications

3. (U) FY 1998 Plan

- (U) (\$12,916) Continue reentry system applications program. Full obligation is projected by the 3rd quarter of the 1st year. FY 1998 efforts include:
  - (U) Continue Ground Testing of reentry vehicle candidate materials including those available from Science & Technology (S&T).
    - (U) Manufacture and ground test candidate nosetip and heatshield replacement materials.
    - (U) Development program plan for testing and evaluation of reentry components exposed to operational environments beyond their design life.
    - (U) Maintain Technical Program Plan.
    - (U) Continue development of instrumentation for flight test applications.
- (U) (\$10,929) Continue Strategic Guidance Applications program. Full obligation is projected the by 3rd quarter of the 1st year. FY 1998 efforts include:
  - (U) Continue development of IEE towards full system functionality. Continue expanding the SIGHTS. (Due to reduced funding available in FY 1998, additional development of the altitude and stellar module is now planned for FY 1999.) Deliver and begin utilization of the "probes" initiated in FY 1997.
  - (U) Continue the prototype/design tradeoff effort for the next generation PIGA. The review of alternate accelerometer efforts/technologies and the status of the next generation PIGA for down select to one or more technologies will be pursued with eventual evaluation in SIGHTS. Complete the radiation testing of IFOG technology.

4. (U) FY 1999 Plan

- (U) (\$21,677) Continue reentry system applications program. Full obligation is projected by the 3rd quarter of the 1st year. FY 1999 efforts include:
  - (U) Conduct ground testing of candidate nosetip & heatshield replacement materials.
  - (U) Initiate planning for procurement of flight required hardware and instrumentation for aging evaluation.
  - (U) Conduct ground testing and analysis of reentry components exposed to operational environments beyond their design life.

R-1 Line Item 150

Budget Item Justification  
(Exhibit R-2, page 10 of 21)

# UNCLASSIFIED

# UNCLASSIFIED

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

Date: Feb 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0101221N

PROJECT NUMBER: J2228

PROGRAM ELEMENT TITLE: Strategic Submarine &  
Weapon Systems Support

PROJECT TITLE: Technology  
Applications

- (U) (\$17,520) Continue Strategic Guidance Applications Program. Projected obligation by 3rd quarter of the 1st year. FY 1999 efforts include:
  - (U) Continue IEE System functionality and provide improved fidelity towards a "virtual" system capability in FY 2001. Continue expanding the hardware design support of SIGHTS into other subsystems such as altitude and stellar and their associated hardware correlation. Continue with IEE/SIGHTS towards a "real time hardware-in-the-loop" simulation capability targeted for completion in late FY 2002.
  - (U) Dependent on prior year performance, possibly initiate fabrication and testing of prototype accelerometers. Stellar and Rad Hard electronics tasks depend on the results of prior year efforts.

B. (U) PROGRAM CHANGE SUMMARY:

(U) CHANGE SUMMARY EXPLANATION:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	27,797	28,697	38,949
(U) Appropriated Value:	27,797	28,697	38,949
(U) Adjustment to FY 1997 Appropriated Value/President's Budget:	-6,081	-4,852	+248
(U) FY 1999 PresBud submit:	21,716	23,845	39,197

(U) CHANGE SUMMARY EXPLANATION:

- (U) The FY 1997 reduction results from enacted below threshold reprogrammings, SBIR transfer and miscellaneous pricing adjustments. The decrease in FY 1998 is a combination of affordability-based programmatic deferrals (\$-4,000) and Congressional adjustments (\$-852K). The increase in FY 1999 represents a combination of affordability-based funding reductions(\$-3,188), FY 1998 deferrals (\$+4,000), and miscellaneous pricing adjustments (\$-564). FY 1997 and FY 1998 funding reductions have deferred development of some applications, however achievement of overall program objectives will remain on track with full appropriation of FY 1999 funds.
- (U) Schedule: N/A

R-1 Line Item 150

Budget Item Justification  
(Exhibit R-2, page 11 of 21)

# UNCLASSIFIED

# UNCLASSIFIED

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

DATE: Feb 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0101221N

PROJECT NUMBER: J2228

PROGRAM ELEMENT TITLE: Strategic Submarine and  
Weapon System Support

PROJECT TITLE: Technology

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

FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE/ TOTAL PROGRAM
NA	NA	NA	NA	NA	NA	NA	NA

(U) RELATED RDT&E: FY 1994 Program Element J0091 FBM Systems (\$2,105K), and Program Element 0603308F, Strategic Missile Modernization. This program element includes the resources which will support the Air Force/Reentry System Applications program.

D. (U) SCHEDULE PROFILE: N/A

(U) COST (Dollars in thousands)

R-1 Line Item 150

Budget Item Justification  
(Exhibit R-2, page 12 of 21)

# UNCLASSIFIED

# UNCLASSIFIED

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

DATE: Feb 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0101221N

PROGRAM NUMBER: J2228

PROGRAM ELEMENT TITLE: Strategic Submarine and  
Weapon System Support

PROJECT TITLE: Technology  
Applications

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

Project Cost Categories

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Reentry System Applications	12,305	12,916	21,677
b. Strategic Guidance Applications	9,411	10,929	17,520
Total	21,716	23,845	39,197

R-1 Line Item 150

Budget Item Justification  
(Exhibit R-2, page 13 of 21)

# UNCLASSIFIED

# UNCLASSIFIED

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

Date: Feb 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0101221N

PROJECT NUMBER: J2228

PROGRAM ELEMENT TITLE: Strategic Submarine and  
Weapon System Support

PROJECT TITLE: Technology  
Applications

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

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	FY 1996 & prior Budget	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development										
LMSC	SS/CPFF	1/96	5,251	5,251	5,251				0	5,251
LMSC	SS/CPFF	1/97	6,739	6,739		6,739			0	6,739
LMSC	SS/CPFF	1/98	6,216	6,216			6,216		0	6,216
LMSC	SS/CPFF	1/99	11,676	11,677				11,677	0	11,677
CSDL	SS/CPFF	3/96	8,215	8,215	8,215				0	8,215
CSDL	SS/CPFF	2/97	9,411	9,411		9,411			0	9,411
CSDL	SS/CPFF	10/97	10,929	10,929			10,929		0	10,929
CSDL	SS/CPFF	10/98	17,521	17,520				17,520	0	17,520

GOVERNMENT FURNISHED PROPERTY

Item Description	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Delivery Date	FY 1996 Budget	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development									
NSWC	WR	10/95		3,394				0	3,394
NSWC	WR	1/97			5,216			0	5,216
NSWC	WR	10/97				5,500		0	5,500
NSWC	WR	10/98					8,500	0	8,500
DOE	WR	10/95 - 10/98		209	350	1,200	1,500	0	3,259

R-1 Line Item 150

Budget Item Justification  
(Exhibit R-2, page 14 of 21)

# UNCLASSIFIED

# UNCLASSIFIED

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

Date: Feb 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0101221N

PROJECT NUMBER: S0004

PROGRAM ELEMENT TITLE: Strategic Submarine and  
Weapon System Support

PROJECT TITLE: TRIDENT Submarine  
System Improvement

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
S0004 TRIDENT Submarine System Improvements	1,548	4,589	7,414	2,202	0	1,492	1,512	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The TRIDENT Submarine System Improvement Program develops and integrates command and control improvements needed to maintain TRIDENT submarine operational capability through the life cycle of this vital strategic asset. The program conducts efforts needed to maintain strategic connectivity, ensure platform invulnerability, and reduce life cycle costs through OER and commonality.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$1,500) Initiated Acoustic Rapid Commercial Off The Shelf (COTS) Insertion (ARCI) Phase I/II Multipurpose Processor(MPP) Program.
- (U) (\$30) Initiated TRIDENT Hovering Keel Depth and Missile Compensation Transducer Replacement Impact Investigation.
- (U) (\$18) Performed TRIDENT CCS laboratory functions.

R-1 Line Item 150

Budget Item Justification  
(Exhibit R-2, page 15 of 21)

# UNCLASSIFIED

# UNCLASSIFIED

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

Date: Feb 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0101221N

PROJECT NUMBER: S0004

PROGRAM ELEMENT TITLE: Strategic Submarine and  
Weapon System Support

PROJECT TITLE: TRIDENT Submarine  
System improvement

## 2. (U) FY 1998 PLAN:

- (U) (\$2,755) Initiate development of TRIDENT CCS MK2 Block 1C Defensive Weapons System (DWS) Program.
- (U) (\$600) Initiate development of AN/BQQ-6 Sonar to AN/BQQ-5E Sonar Translator.
- (U) (\$888) Continue development of ARCI Phase I/II MPP Program.
- (U) (\$346) Initiate Architecture Model Maintenance and COTS Technical Refresher.

## 3. (U) FY 1999 PLAN:

- (U) (\$3,368) Complete development of TRIDENT CCS MK2 Block 1C DWS Program.
- (U) (\$2,396) Continue development of ARCI Phase I/II MPP Program.
- (U) (\$1,650) Continue development of Architecture Model Maintenance and COTS Technical Refresher.

R-1 Line Item 150

Budget Item Justification  
(Exhibit R-2, page 16 of 21)

# UNCLASSIFIED

# UNCLASSIFIED

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

Date: Feb 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0101221N

PROJECT NUMBER: S0004

PROGRAM ELEMENT TITLE: Strategic Submarine and  
Weapon System Support

PROJECT TITLE: TRIDENT Submarine  
System improvement

B. (U) PROGRAM CHANGE SUMMARY:	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	1,592	4,729	3,997
(U) Appropriated Value:	1,660	4,729	
(U) Adjustments to FY 1997/98 Appropriated Value/FY 1998 President's Budget:			
a. SBIR Transfer	-42		
b. Congressional Undistributed Reductions	-70		
c. TRIDENT Modernization		+3,525	
d. Minor Pricing Adjustments		-140	-108
(U) FY 1999 PRESBUDG Submit:	1,548	4,589	7,414

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: Adjustments in FY97 were due to the transfer of funds to the Small Business Innovative Research program (decrease \$42K) and Congressional Undistributed Reductions (decrease \$70K). Adjustments in FY98 were the result of minor R&D adjustments (decrease \$140K). Adjustments in FY99 are to support TRIDENT OER programs (increase \$3,525K) and minor pricing adjustments (decrease \$108K).

(U) Schedule: Not applicable.

(U) Technical: The RDT&E program is restructured to align with procurement and installation of OER and SSN/SSBN commonality efforts to sustain TRIDENT's current operational capabilities throughout the 30 plus years service life.

R-1 Line Item 150

Budget Item Justification  
(Exhibit R-2, page 17 of 21)

# UNCLASSIFIED



# UNCLASSIFIED

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

Date: Feb 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0101221N

PROJECT NUMBER: S0004

PROGRAM ELEMENT TITLE: Strategic Submarine and  
Weapon System Support

PROJECT TITLE: TRIDENT Submarine  
System improvement

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

	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
• (U) OPN Line 267600/267606 (BA-2)									
	27,370	7,328	12,687	21,826	20,841	13,015	17,122	CONT.	CONT.
• (U) OPN Line 535500/535506 (BA-4)									
	2,061	2,259	2,972	9,805	4,721	10,525	5,581	CONT.	CONT.

(U) RELATED RDT&E: These PEs develop submarine software and hardware that are directly related to efforts conducted by the program element.

- (U) PE 0101224N (SSBN Security & Survivability Program)
- (U) PE 0101402N (Navy Strategic Communications)
- (U) PE 0604562N (Submarine Tactical Warfare System)
- (U) PE 0604503N (Submarine System Equipment Development)

D. (U) SCHEDULE PROFILE: Not applicable.

R-1 Line Item 150

Budget Item Justification  
(Exhibit R-2, page 18 of 21)

# UNCLASSIFIED

# UNCLASSIFIED

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

Date: Feb 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0101221N

PROGRAM ELEMENT TITLE: Strategic Submarine and  
Weapon System Support

PROJECT NUMBER: S0004

PROJECT TITLE: TRIDENT Submarine  
System Improvement

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

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Software Development	0	600	0
b. Test and Certification	30	346	2,801
c. Design/Development Engineering	1,500	3,643	4,613
d. Support and Management	18	0	0
Total	1,548	4,589	7,414

R-1 Line Item 150

Budget Item Justification  
(Exhibit R-2, page 19 of 21)

# UNCLASSIFIED

# UNCLASSIFIED

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

Date: Feb 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0101221N

PROJECT NUMBER: S0004

PROGRAM ELEMENT TITLE: Strategic Submarine and  
Weapon System Support

PROJECT TITLE: TRIDENT Submarine  
System Improvement

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

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999To Budget	Complete	Total Program
Product Development										
General Electric, Camden, NJ (EHF)										
	SS-CPFF	7/96	11,715	11,715	11,715	0	0	0	0	11,715
Lockheed Martin, Manassas, VA (ARCI)										
	SS-CPFF	2/97	4,306	4,306	0	1,500	888	1,918	0	4,306
NUWC DIV, Newport, RI (CCS MK2 Block 1C)										
	WR		5,450	5,450	0	0	2,755	2,695	0	5,450
NUWC DIV, Newport, RI (Q6 to Q5 Translator)										
	WR		600	600	0	0	600	0	0	600
Support and Management										
Miscellaneous	Various	Various	18	18	0	18 0	0	0	18	
Test and Evaluation										
Miscellaneous	Various	Various	2,414	2,414	683	30 0	1,151	550	2,414	
NUWC DIV, Newport, RI (Architecture Model)										
	WR		CONT.	CONT.		346	1,650	CONT.	CONT.	

R-1 Line Item 150

Budget Item Justification  
(Exhibit R-2, page 20 of 21)

# UNCLASSIFIED

# UNCLASSIFIED

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

Date: Feb 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0101221N

PROJECT NUMBER: S0004

PROGRAM ELEMENT TITLE: Strategic Submarine and  
Weapon System Support

PROJECT TITLE: TRIDENT Submarine  
System improvement

GOVERNMENT FURNISHED PROPERTY - Not applicable.

	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Subtotal Product Development	11,715	1,500	4,243	4,613	0	22,071
Subtotal Support and Management	0	18	0	0	0	18
Subtotal Test and Evaluation	683	30	346	2,801	CONT.	CONT.
Total Project	12,398	1,548	4,589	7,414	CONT.	CONT.

R-1 Line Item 150

Budget Item Justification  
(Exhibit R-2, page 21 of 21)

# UNCLASSIFIED

# UNCLASSIFIED

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0101226N

PROGRAM ELEMENT TITLE: Submarine Acoustic Warfare Development

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
V1265 Submarine Defensive Warfare	7,391	5,800	8,328	6,535	3,773	4,913	5,778	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project develops a Submarine Defensive Warfare System (SDWS) to improve the effectiveness and survivability of all classes of US submarines. Project efforts consist of a new acoustic threat intercept system (AN/WLY-1) that will have threat platform sonar and torpedo recognition capability for early detection, classification, and tracking of threats. It will allow radius of curvature and multipath ranging. The system will also include a control subsystem for launch management of all onboard countermeasure devices and launchers. Next Generation Countermeasure (NGCM) including Weapons Analysis Facility (WAF) simulation analysis capability provides the US Navy with testing of hardware and software within detailed representations of acoustic environments. NGCM concepts include offensive/defensive capabilities against threat submarines and torpedoes. Another possible future concept is the Submarine Littoral Warfare Missile (SLWM), which provides threat neutralization of small aircraft, helicopters and small, fast patrol crafts in littoral areas.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under Operational Systems Development because it encompasses engineering and manufacturing development for upgrade of existing, operational systems.

R-1 Line Item 152

Budget Item Justification  
(Exhibit R-2, page 1 of 8)

# UNCLASSIFIED

# UNCLASSIFIED

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0101226N

PROJECT NUMBER: V1265

PROGRAM ELEMENT TITLE: Submarine Acoustic Warfare Development

PROJECT TITLE: Submarine Defensive Warfare

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$7,276) Conducted Critical Design Review (CDR-2), and fabrication and development of AN/WLY-1.
- (U) (\$115) Continued technology updates for the Submarine Torpedo Defense (SMTD) program.

2. (U) FY 1998 PLAN:

- (U) (\$5,800) Continue fabrication and development testing and conduct At-Sea test for the AN/WLY-1.

3. (U) FY 1999 PLAN:

- (U) (\$6,967) Complete sensor and software development and conduct Phase II design review.
- (U) (\$1,361) Perform WAF analysis. Perform system analysis and prototyping for NGCM including SMTD and C303/S Mobile Countermeasure.

R-1 Line Item 152

Budget Item Justification  
(Exhibit R-2, page 2 of 8)

# UNCLASSIFIED

# UNCLASSIFIED

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0101226N

PROJECT NUMBER: V1265

PROGRAM ELEMENT TITLE: Submarine Acoustic Warfare Development

PROJECT TITLE: Submarine Defensive Warfare

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	7,548	6,058	8,348
(U) Appropriated Value:	7,917	6,058	
(U) Adjustments to FY 1997/98 Appropriated Value/FY 1998 President's Budget:			
a. FY97 SBIR Transfer	-148		
b. Congressional Undistributed Reductions	-378	-258	
c. Minor Pricing Adjustments			-20
(U) FY 1999 PRESUDG Submit:	7,391	5,800	8,328

R-1 Line Item 152

Budget Item Justification  
(Exhibit R-2, page 3 of 8)

# UNCLASSIFIED

# UNCLASSIFIED

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0101226N

PROJECT NUMBER: V1265

PROGRAM ELEMENT TITLE: Submarine Acoustic Warfare Development

PROJECT TITLE: Submarine Defensive Warfare

## (U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1997: Congressional undistributed reductions (-\$378) and SBIR transfer (-\$148).  
FY 1998: Congressional Undistributed Reductions (-\$258). FY 1999: Minor Pricing Adjustment (-\$20).

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

R-1 Line Item 152

Budget Item Justification  
(Exhibit R-2, page 4 of 8)

# UNCLASSIFIED



# UNCLASSIFIED

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0101226N

PROJECT NUMBER: V1265

PROGRAM ELEMENT TITLE: Submarine Acoustic Warfare Development

PROJECT TITLE: Submarine Defensive Warfare

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

	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
OPN Submarine Acoustic Warfare Systems									
BLI: 2210	6,889	3,379	7,326	12,293	11,292	13,902	21,629	CONT.	CONT.

(U) RELATED RDT&E: Not applicable

D. (U) SCHEDULE PROFILE: AN/WLY-1 DEVELOPMENT SCHEDULE

FY 1998	FY 1999	FY 2000
AT-SEA TEST - 2Q FY98 EMD FABRICATION	PHASE II DESIGN REVIEW - 2Q FY99 EMD FABRICATION	DT II A/B - 1Q FY00 DT II C - 2Q FY00 TECHEVAL - 2Q FY00 OPEVAL - 3Q FY00 MS III - 4Q FY00

R-1 Line Item 152

Budget Item Justification  
(Exhibit R-2, page 5 of 8)

# UNCLASSIFIED

# UNCLASSIFIED

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

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0101226N

PROJECT NUMBER: V1265

PROGRAM ELEMENT TITLE: Submarine Acoustic Warfare Development

PROJECT TITLE: Submarine Defensive Warfare

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

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Primary Hardware Development	6,426	5,028	7,478
b. Development Test and Evaluation	100	0	0
c. Program Management Support	750	672	750
d. Travel	<u>115</u>	<u>100</u>	<u>100</u>
Total	7,391	5,800	8,328

R-1 Line Item 152

RDT&E PE/Project Cost Breakdown  
(Exhibit R-3, page 6 of 8)

# UNCLASSIFIED

# UNCLASSIFIED

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

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0101226N

PROJECT NUMBER: V1265

PROGRAM ELEMENT TITLE: Submarine Acoustic Warfare Development

PROJECT TITLE: Submarine Defensive Warfare

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

## PERFORMING ORGANIZATIONS

Contractor/ Government Performing <u>Activity</u>	Contract Method/ Fund Type <u>Vehicle</u>	Award/ Oblig Date	Perform Activity <u>EAC</u>	Project Office <u>EAC</u>	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development - Not applicable.										

Support and Management - Not applicable.

Test and Evaluation - Not applicable.

## GOVERNMENT FURNISHED PROPERTY:

Product Development - Not applicable.

Management and Support - Not applicable.

Test and Evaluation - Not applicable.

R-1 Line Item 152

RDT&E PE/Project Cost Breakdown  
(Exhibit R-3, page 7 of 8)

# UNCLASSIFIED

# UNCLASSIFIED

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

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0101226N

PROJECT NUMBER: V1265

PROGRAM ELEMENT TITLE: Submarine Acoustic Warfare Development

PROJECT TITLE: Submarine Defensive Warfare

Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
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Subtotal Product Development - Not applicable.

Subtotal Support and Management - Not applicable.

Subtotal Test and Evaluation - Not applicable.

Total Project

R-1 Line Item 152

RDT&E PE/Project Cost Breakdown  
(Exhibit R-3, page 8 of 8)

# UNCLASSIFIED

# UNCLASSIFIED

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204136N

PROGRAM ELEMENT TITLE: F/A-18 SQUADRONS

(U) COST: (Dollars in Thousands)

<u>PROJECT NUMBER &amp; TITLE</u>	<u>FY 1997 ACTUAL</u>	<u>FY 1998 ESTIMATE</u>	<u>FY 1999 ESTIMATE</u>	<u>FY 2000 ESTIMATE</u>	<u>FY 2001 ESTIMATE</u>	<u>FY 2002 ESTIMATE</u>	<u>FY 2003 ESTIMATE</u>	<u>TO COMPLETE</u>	<u>TOTAL PROGRAM</u>
E1662 F/A-18 Improvements	51,714	45,601	97,198	130,075	100,077	40,382	16,745	0	3,098,525
E2065 F/A-18 RADAR Upgrade	20,296	2,244	0	0	0	0	0	0	290,320
E2130 F/A-18 Follow-On Variant	330,806	260,068	216,607	145,214	28,766	9,165	9,035	0	5,635,136
E2350 F/A-18F TAC RECCE	0	2,911	43,409	45,106	16,496	3,553	62	0	111,537
TOTAL	402,816	310,824	357,214	320,395	145,339	53,100	25,842	0	9,135,518
RDT&E Articles		10							10

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The F/A-18 is capable of using external equipment to perform either fighter or attack missions. The capabilities of the F/A-18 weapon system can be upgraded to accommodate and incorporate new or enhanced weapons as well as advances in technology to respond effectively to emerging future threats. Continued development capability is required to successfully optimize new F/A-18 weapon system capabilities

R-1 Item No.153

# UNCLASSIFIED

# UNCLASSIFIED

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204136N

PROGRAM ELEMENT TITLE: F/A-18 SQUADRONS

in the Fleet. Additionally, continued improvements in reliability and maintainability are necessary to ensure maximum benefit is achieved through reduced cost of ownership and to provide enhanced availability.

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION (Continued): The F/A-18 Naval Strike Fighter program transitioned from full-scale engineering development to operational systems development during FY 1983. As F/A-18 squadrons report discrepancies and new requirements, a continuing capability is needed to perform technical evaluations, investigative flight testing, software support, and incorporate Pre-Planned Product Improvements (P<sup>3</sup>I) (i.e., capability enhancements). The F/A-18 radar (APG-65) has been upgraded to the APG-73 to operate in the projected electronic warfare environment of the 1990's. The follow-on F/A-18 (E/F version) is an airframe upgrade incorporating increased capabilities, performance, and survivability necessary to satisfy the 41% percent increase in range over the C/D in the high-low-low-high attack/interdiction mission carrying three 480 gallon drop tanks, four 1,000 pound bombs, and two AIM-9 air-to-air missiles. The E/F version will have increased internal fuel capacity, increased weapons carriage capability, increased carrier recovery payload, enhanced survivability/vulnerability, increased growth capacity, and increased engine thrust. It will retain all of the P<sup>3</sup>I enhancements developed for the earlier night attack C/D version of the aircraft.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it encompasses engineering and manufacturing development for upgrade of existing, operational systems.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204136N

PROGRAM ELEMENT TITLE: F/A-18 SQUADRONS

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
E1662 F/A-18 Improvements	51,714	45,601	97,198	130,075	100,077	40,382	16,745	0	3,098,525

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The F/A-18 is a multi-mission strike fighter aircraft that is used in both fighter and attack roles through selected use of external equipment (fuel tanks, targeting/navigation Forward Looking Infrared (FLIR) pods and various bomb/missile launching racks). In order to respond effectively to emerging future threats, F/A-18 aircraft capabilities are being upgraded to incorporate new/enhanced weapons systems and avionics including the Positive Identification System (PIDS) (incorporates Congressionally mandated Combined Interrogator Transponder (CIT) Identification Friend or Foe (IFF) System), Digital Communications System (DCS), Joint Helmet Mounted Cueing System (JHMCS), Advanced Targeting Forward Looking Infrared (ATFLIR) and a Precision Strike Upgrade. "Precision Strike" refers to a set of proposed upgrades to sensors, weapons, displays, delivery algorithms and connectivity which collectively are intended to provide high precision standoff targeting. Continued hardware/software development is required to successfully optimize fleet F/A-18 weapons systems. As F/A-18 squadrons report system problems/requirements, a continuing capability is needed to perform technical evaluations/investigative flight testing, provide software support and integrate selected improvements.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204136N

PROJECT NUMBER: E1662

PROGRAM ELEMENT TITLE: F/A-18 SQUADRONS

PROJECT TITLE: F/A-18 IMPROVEMENTS

A. (U) Program Accomplishments and Plans:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U)(\$2,900) Began development of the Advanced Targeting Forward Looking Infrared (ATFLIR) System.
- (U)(\$35,977) Continued to develop and integrate enhancements to the effectiveness, operability, and safety of the F/A-18 Weapon System (airframe, avionics, weapons, and subsystems). Continued to investigate deficiencies and develop corrective action. Continued development of PIDS for combat identification and JHMCS.
- (U)(\$1,304) Continued to conduct engineering analysis and development improvements to existing systems and subsystems for deficiencies identified during deployment of the aircraft. Provided technical support for the integration of new weapons and systems.
- (U)(\$1,765) Provided technical support, integration testing and engineering analysis for PIDS and JHMCS. Planned procurement and continued development of DCS.
- (U)(\$9,768) Commenced engineering design for integration of BOL Chaff Dispenser (LAU-138) into the F/A-18.

2. (U) FY 1998 PLAN:

- (U)(\$1,966) Continue to develop and integrate enhancements to the effectiveness, operability, and safety of the F/A-18 Weapon System (airframe, avionics, weapons, and subsystems). Continue to investigate deficiencies and develop corrective action.
- (U)(\$1,415) Continue to conduct engineering analysis and development improvements to existing systems and subsystems for deficiencies identified during deployment of the aircraft. Provide technical support for the integration of new weapons and systems.
- (U)(\$42,220) Continue development of DCS, PIDS, ATFLIR, and JHMCS.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204136N

PROJECT NUMBER: E1662

PROGRAM ELEMENT TITLE: F/A-18 SQUADRONS

PROJECT TITLE: F/A-18 IMPROVEMENTS

3. (U) FY 1999 PLAN:

- (U)(\$6,888) Continue to develop and integrate enhancements to the effectiveness, operability, and safety of the F/A-18 Weapon System (airframe, avionics and weapons) and subsystems to include Multifunctional Information Distribution System (MIDS), AIM-9X, Embedded Global Positioning System/Inertial Navigation System (EGI) and Tactical Air Moving Map Capability (TAMMAC). Continue to investigate deficiencies and develop corrective action.
- (U)(\$1,548) Continue to conduct engineering analysis and development improvements to existing systems and subsystems for deficiencies identified during deployment of the aircraft. Provide technical support for the integration of new weapons and systems.
- (U)(\$38,482) Continue development of DCS, PIDS and JHMCS.
- (U)(\$50,280) Continue ATFLIR development. Commence development of Precision Strike Upgrade, including an Advanced Mission Computer and Displays.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204136N

PROJECT NUMBER: E1662

PROGRAM ELEMENT TITLE: F/A-18 SQUADRONS

PROJECT TITLE: F/A-18 IMPROVEMENTS

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	58,676	47,110	70,188
(U) Appropriated Value:		47,110	
(U) Adjustments from PRESBUDG:	-6,962	-1,509	+27,010
(U) FY 1999 President's Budget Submit:	51,714	45,601	97,198

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: The net decrease in FY 1997 of - \$1,430 thousand for Small Business Innovation Research adjustment, and -\$5,494 for Congressional reductions and -\$38 thousand for minor pricing adjustments. FY 1998 decrease includes -\$1,405 thousand for Congressional reductions, and -\$104 thousand for economic assumptions. FY 1999 net increase of +\$27,010 thousand is funding for the development of the Advanced Targeting Forward Looking Infrared (ATFLIR) System, Precision Strike Upgrade, F/A-18E/F First Deployment Avionics Suite software, and various balancing adjustments.

(U) Schedule: Not Applicable.

(U) Technical: Not Applicable.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204136N

PROJECT NUMBER: E1662

PROGRAM ELEMENT TITLE: F/A-18 SQUADRONS

PROJECT TITLE:

F/A-18 IMPROVEMENTS

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

	<u>FY 1997</u> <u>ACTUAL</u>	<u>FY 1998</u> <u>ESTIMATE</u>	<u>FY 1999</u> <u>ESTIMATE</u>	<u>FY 2000</u> <u>ESTIMATE</u>	<u>FY 2001</u> <u>ESTIMATE</u>	<u>FY 2002</u> <u>ESTIMATE</u>	<u>FY 2003</u> <u>ESTIMATE</u>	<u>TO</u> <u>COMPLETE</u>	<u>TOTAL</u> <u>PROGRAM</u>
F/A-18 C/D QTY	6	0	0	0	0	0	0	0	1,027
APN-1	272,042	0	0	0	0	0	0	0	3,738,619
APN-5	144,257	140,638	198,049	299,666	208,796	189,639	224,430	Cont.	Cont.
APN-6	9,586	0	0	0	0	0	0	0	133,345

(U) RELATED RDT&E:

- (U) PE 0207163N Advanced Medium Range Air-To-Air Missile (AMRAAM)
- (U) PE 0604727N Joint Stand-off Weapon (JSOW) System
- (U) PE 0604270N EW Development
- (U) PE 0305141D BQH Communications
- (U) PE 0604777N Navigation ID System, project X0921, NAVSTAR GPS equipment

D. (U) SCHEDULE PROFILE: Not Applicable.

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

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204136N

PROJECT NUMBER:

E1662

PROGRAM ELEMENT TITLE: F/A-18 SQUADRONS

PROJECT TITLE:

F/A-18 IMPROVEMENTS

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

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Contracts	30,401	21,104	52,233
b. In-House	15,896	17,280	30,020
c. Test & Evaluation	5,417	7,217	14,945
Total	51,714	45,601	97,198

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

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204136N

PROJECT NUMBER:

E1662

PROGRAM ELEMENT TITLE: F/A-18 SQUADRONS

PROJECT TITLE:

F/A-18 IMPROVEMENTS

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

PERFORMING ORGANIZATIONS:

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development										
Boeing MDA	SS/CPFF/FFP	3,7,9/93	1,565	1,565	1,565	0	0	0	0	1,565
Boeing MDA St. Louis, MO	SS/CPFF/FFP	12/93	99,357	99,357	50,599	13,810	7,639	18,139	9,170	99,357
Rockwell-Collins Cedar Rapids, IA	SS/FFP	7/96	16,108	16,108	6,000	7,244	2,864	0	0	16,108
Boeing MDA (ATFLIR)	CPIF/AF	12/97	TBD	127,518	0	1,579	10,601	31,987	83,351	127,518
Boeing MDA (Precision Strike)	TBD	11/98	TBD	83,045	0	0	0	2,107	80,938	83,045
TBD (BOL CHAFF)	TBD	TBD	TBD	7,768	0	7,768	0	0	0	7,768
Other Contracts	Var	Var	3,719	3,719	3,719	0	0	0	0	3,719
WPAFB Dayton OH	MIPR	12/98	7,192	7,192	0	2,000	2,076	1,829	1,287	7,192
NAWC China Lake	WX	11/98	143,922	143,922	19,223	10,398	13,497	25,926	74,878	143,922
Other Field Activities	WX	11/98	9,427	9,427	672	1,733	776	1,209	5,037	9,427
Support and Management Field Activities	Var	11/98	11,028	11,028	3,354	1,765	931	1,056	3,922	11,028
Test and Evaluation NAWC Pax River	WX	11/98	76,572	76,572	20,297	5,417	7,217	14,945	28,696	76,572

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

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204136N

PROJECT NUMBER: E1662

E1662

PROGRAM ELEMENT TITLE: F/A-18 SQUADRONS

PROJECT TITLE:

F/A-18 IMPROVEMENTS

GOVERNMENT FURNISHED PROPERTY:

Item Description	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Delivery Date	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development				N/A					
Support and Management				N/A					
Test and Evaluation				N/A					
				<u>Total FY 1996 &amp; Prior</u>	<u>FY 1997 Budget</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Subtotal Product Development				81,778	44,532	37,453	81,197	254,661	499,621
Subtotal Support and Management				3,354	1,765	931	1,056	3,922	11,028
Subtotal Test and Evaluation				20,297	5,417	7,217	14,945	28,696	76,572
Total Project	FY92 & Prior			2,511,304 2,511,304	105,429	51,714	45,601	97,198	287,279
									2,511,304 3,098,525

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE:

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204136N

PROGRAM ELEMENT TITLE: F/A-18 SQUADRONS

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
E2065 F/A-18 Radar Upgrade	20,296	2,244	0	0	0	0	0	0	290,320

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The AN/APG-73 radar will alleviate Electronic Counter-Countermeasures (ECCM) deficiencies in providing a modern, cost effective replacement for the AN/APG-65 Radar. The AN/APG-73 design incorporates hardware and software upgrades which increase ECCM effectiveness and provide growth potential for advanced ECCM capabilities. The AN/APG-73 also provides significant improvements in resolution, dynamic range, processing speed and memory over the AN/APG-65. The AN/APG-73 capitalizes on AN/APG-70/71 developmental and value engineering programs to maximize Shop Replaceable Assembly (SRA) commonality. The Pre-Planned Product Improvement (P<sup>3</sup>I) Phase II Program will add improved hardware and software for all weather Reconnaissance (RECCE) strip map and spotlight modes.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204136N

PROJECT NUMBER: E2065

PROGRAM ELEMENT TITLE: F/A-18 SQUADRONS

PROJECT TITLE: RADAR UPGRADE

A. (U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U)(\$14,404) Completed Phase II hardware and software Design and Development. Prepared for Validation and Verification/Technical Evaluation.
- (U)(\$5,892) Performed Radar Upgrade (RUG) Phase II integration testing and engineering analysis for the Radar Upgrade Program. Continued in-house engineering support. Completed Tactical Reconnaissance (TAC RECCE)/Rug Phase II integration.

2. (U) FY 1998 PLAN:

- (U)(\$2,244) Conduct RUG Phase II Follow-on Test and Evaluation.

3. (U) FY 1999 PLAN: Not Applicable.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204136N

PROJECT NUMBER: E2065

PROGRAM ELEMENT TITLE: F/A-18 SQUADRONS

PROJECT TITLE: RADAR UPGRADE

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	20,864	2,330	0
(U) Appropriated Value:		2,330	
(U) Adjustments from PRESBUDG:	-568	-86	0
(U) FY 1999 President's Budget Submit:	20,296	2,244	0

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1997 net decrease reflects-\$539 thousand represents a Small Business Innovation Research (SBIR) adjustment and -\$29 general reductions and minor program adjustments. FY 1998 decrease includes -\$86 thousand for Congressional reductions.

(U) Schedule: Not Applicable.

(U) Technical: Not Applicable.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204136N

PROJECT NUMBER: E2065

PROGRAM ELEMENT TITLE: F/A-18 SQUADRONS

PROJECT TITLE: RADAR UPGRADE

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

	<u>FY 1997</u> <u>ACTUAL</u>	<u>FY 1998</u> <u>ESTIMATE</u>	<u>FY 1999</u> <u>ESTIMATE</u>	<u>FY 2000</u> <u>ESTIMATE</u>	<u>FY 2001</u> <u>ESTIMATE</u>	<u>FY 2002</u> <u>ESTIMATE</u>	<u>FY 2003</u> <u>ESTIMATE</u>	<u>TO</u> <u>COMPLETE</u>	<u>TOTAL</u> <u>PROGRAM</u>
(U) PROCUREMENT:									
F/A-18 RADAR UPGRADE									
(U) APN-1									
C/D	14,270	0	0	0	0	0	0	0	468,303
E/F	29,273	52,234	75,314	88,904	101,152	114,159	113,579	695,887	1,270,502
(U) APN-5 (RADAR)									
	7,784	15,333	19,546	30,955	32,173	61,201	54,625	98,830	320,447
(U) RELATED RDT&E:									
(U) PE 0603261N									
									Tactical Airborne Reconnaissance (TAC RECCE)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204136N

PROJECT NUMBER: E2065

PROGRAM ELEMENT TITLE: F/A-18 SQUADRONS

PROJECT TITLE: RADAR UPGRADE

D. (U) SCHEDULE PROFILE:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>To Complete</u>
Program Milestones				
Engineering Milestones				
T&E Milestones		1Q-2Q/TECHEVAL PH II 3Q/FOT&E PH II		
Contract Milestones				

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

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204136N

PROJECT NUMBER: E2065

PROGRAM ELEMENT TITLE: F/A-18 SQUADRONS

PROJECT TITLE: RADAR UPGRADE

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

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Contracts	14,404	0	0
b. In-House	349	346	0
c. Test & Evaluation	5,543	1,898	0
Total	20,296	2,244	0

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

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204136N

PROJECT NUMBER: E2065

PROGRAM ELEMENT TITLE: F/A-18 SQUADRONS

PROJECT TITLE: RADAR UPGRADE

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

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development										
Boeing MDA(RUG PHI) St. Louis, MO	SS/LTR(FPIF)	4/90	170,903	170,903	170,903	0	0	0	0	170,903
Boeing MDA(RUG PH II) (RUG PH II)(INTEG) St. Louis, MO	CPIF CPFF	3/95 11/95	53,973 11,000	53,973 11,000	39,569 11,000	14,404 0	0 0	0 0	0 0	53,973 11,000
Support and Management										
In-House Support Rail Co. Towson, MD	T&M	9/94	2,220	2,220	1,525	349	346	0	0	2,220
Test and Evaluation										
NAWC China Lake	WX	N/A	36,257	36,257	31,219	3,460	1,578	0	0	36,257
COMOPTEVFOR Norfolk, VA	WX	N/A	1,799	1,799	0	1,799	0	0	0	1,799
Other Field Activities	Var	Var	5,032	5,032	4,428	284	320	0	0	5,032

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

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204136N

PROJECT NUMBER: E2065

PROGRAM ELEMENT TITLE: F/A-18 SQUADRONS

PROJECT TITLE: RADAR UPGRADE

GOVERNMENT FURNISHED PROPERTY:

<u>Item Description</u>	<u>Contract Method/ Fund Type Vehicle</u>	<u>Award/ Oblig Date</u>	<u>Delivery Date</u>	<u>Total FY 1996 &amp; Prior</u>	<u>FY 1997 Budget</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Product Development									
GFP/Munitions	FFP	N/A	N/A	9,136	0	0	0	0	9,136
Support and Management									
				N/A					
Test and Evaluation									
				N/A					
				<u>Total FY 1996 &amp; Prior</u>	<u>FY 1997 Budget</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Subtotal Product Development				230,608	14,404	0	0	0	245,012
Subtotal Support and Management				1,525	349	346	0	0	2,220
Subtotal Test and Evaluation				35,647	5,543	1,898	0	0	43,088
Total Project				267,780	20,296	2,244	0	0	290,320

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204136N

PROGRAM ELEMENT TITLE: F/A-18 SQUADRONS

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 <u>ACTUAL</u>	FY 1998 <u>ESTIMATE</u>	FY 1999 <u>ESTIMATE</u>	FY 2000 <u>ESTIMATE</u>	FY 2001 <u>ESTIMATE</u>	FY 2002 <u>ESTIMATE</u>	FY 2003 <u>ESTIMATE</u>	TO <u>COMPLETE</u>	TOTAL <u>PROGRAM</u>
E2130 F/A-18 Follow-On Variant	330,806	260,068	216,607	145,214	28,766	9,165	9,035	0	5,635,136
RDT&E Articles		10							10

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The F/A-18 is a twin-engine, mid-wing, multi-mission, tactical aircraft employed in Navy and Marine Corps strike fighter squadrons. The F/A-18, through selected use of external equipment is designed for flexibility in fighter, attack, fleet air defense, and close air support roles. The F/A-18 E/F variant is an upgrade to the night attack "C" and "D" models. The F/A-18 E/F will be the second major upgrade since the program's inception. The F/A-18 E/F incorporates modifications to the air vehicle to increase mission radius, payload flexibility, improve survivability, increase carrier recovery payload and growth potential. This will allow the F/A-18 to continue to adapt its strike fighter role to evolving threats into the next century. The F/A-18 E/F E&MD program is under a Congressional mandated cost cap of \$4.883B FY90 dollars. Pre-development effort of \$36.6M in FY90 base year dollars, previously funded under the F/A-18 C/D program, is reflected in the RDT&E total, but is not included in the approved \$4.883B development cap.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204136N

PROJECT NUMBER: E2130

PROGRAM ELEMENT TITLE: F/A-18 SQUADRONS

PROJECT TITLE: FOLLOW-ON VARIANT

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U)(\$277,024) Continued engineering and manufacturing design activity leading to the development of the airframe and engine.
- (U)(\$20,989) Continued to plan and develop ground test support for integration, test and evaluation. Completed Milestone IIIA. Continued aircraft delivery acceptance.
- (U)(\$32,793) Continued developmental flight test. Commenced DT-IIB and began fatigue testing. Continued to procure GFE items required for developmental effort.

2. (U) FY 1998 PLAN:

- (U)(\$111,855) Continue engineering and manufacturing design activity in support of developmental flight test. Complete engine Full Production Qualification.
- (U)(\$24,293) Continue to develop ground test support for integration and test and evaluation. Complete DT-IIB and OT-IIA.
- (U)(\$116,920) Continue developmental flight testing. Continue to procure GFE items required for developmental effort.
- (U)(\$7,000) Continue Test Program Set (TPS) development.

3. (U) FY 1999 PLAN:

- (U)(\$109,961) Continue engineering and manufacturing design activity in support of developmental flight test. Complete DT-IID.
- (U)(\$20,783) Continue ground testing support for integration, test and evaluation.
- (U)(\$78,863) Continue developmental flight testing. Continue to procure GFE items required for developmental effort. Conduct OT-IIC.
- (U)(\$7,000) Continue Test Program Set (TPS) development.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204136N

PROJECT NUMBER: E2130

PROGRAM ELEMENT TITLE: F/A-18 SQUADRONS

PROJECT TITLE: FOLLOW-ON VARIANT

B. (U) PROGRAM CHANGE SUMMARY

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	343,175	267,536	128,703
(U) Appropriated Value:		244,536	
(U) Adjustments from PRESBUDG:	-12,369	-7,468	+87,904
(U) FY 1999 President's Budget Submit:	330,806	260,068	216,607

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: The net decrease of -\$12,369 thousand in FY 1997 reflects a Small Business Innovation Research (SBIR) reduction, revised economic assumptions, and miscellaneous balancing adjustments. The net decrease of -\$33,468 reflects Congressional adjustments and \$26,000 represents anticipated reprogramming for EMD efforts. The net increase of +\$87,904 thousand in FY 1999 represents funding required to maintain the F/A-18E/F Variant Engineering and Manufacturing Development Program schedule, Navy Working Capital Fund pricing changes, balancing adjustments, and revised economic assumptions.

(U) Schedule: Engine Full Production Qualification (FPQ) will take place in the fourth quarter of FY 1998 due to Engine Blade Containment test results and emergent environmental emission test requirements. FRP award date has been accelerated as a result of acquisition reform initiatives, including concurrent negotiation of the LRIP II and LRIP III contracts. As a result of the OSD Low Rate Initial Production (LRIP) decision in March 1997, the Navy Program Review (NPR) scheduled in FY 1999 has been accelerated by one quarter.

(U) Technical: Not Applicable.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204136N

PROJECT NUMBER: E2130

PROGRAM ELEMENT TITLE: F/A-18 SQUADRONS

PROJECT TITLE: FOLLOW-ON VARIANT

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

	<u>FY 1997</u> <u>ACTUAL</u>	<u>FY 1998</u> <u>ESTIMATE</u>	<u>FY 1999</u> <u>ESTIMATE</u>	<u>FY 2000</u> <u>ESTIMATE</u>	<u>FY 2001</u> <u>ESTIMATE</u>	<u>FY 2002</u> <u>ESTIMATE</u>	<u>FY 2003</u> <u>ESTIMATE</u>	<u>TO</u> <u>COMPLETE</u>	<u>TOTAL</u> <u>PROGRAM</u>
(U) PROCUREMENT:									
(U) A/C QTY	12	20	30	36	42	48	48	312	548
(U) APN1	2,038,097	2,112,805	2,897,221	2,939,116	2,939,469	3,111,650	3,068,520	20,144,646	39,485,157
(U) APN6	80,920	79,896	118,066	52,625	95,146	98,665	66,062	352,470	943,850

(U) RELATED RDT&E:

- (U) PE 0207163N (AMRAAM)
- (U) PE 0604727N (Joint Standoff Weapon System)(JSOW)
- (U) PE 0604270N (EW Development)
- (U) PE 0604777N (Navigation/ID System)
- (U) PE 0305141D (Joint UAV)
- (U) PE 0603261N (Tactical Airborne Reconnaissance)
- (U) PE 0204163N (Fleet Communications)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204136N

PROJECT NUMBER: E2130

PROGRAM ELEMENT TITLE: F/A-18 SQUADRONS

PROJECT TITLE: FOLLOW-ON VARIANT

D. (U) SCHEDULE PROFILE:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>To Complete</u>
Program Milestones	2Q/NPR 2Q/MS-IIIA	2Q/NPR	1Q/NPR	2Q/00 MS-III
Engineering Milestones		4Q/Eng FPQ		
T&E Milestones	1Q97-1Q98/DT-IIB	1Q/OT-IIA	1Q99-2Q99/DT-IID (TECHEVAL) 3Q99-1Q00/OT-IIC (OPEVAL)	
Contract Milestones	3Q/LRIP-2 Long Lead	3Q/LRIP-3 Long Lead	1Q/FRP Long Lead	2Q/00 FRP

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

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204136N

PROJECT NUMBER: E2130

PROGRAM ELEMENT TITLE: F/A-18 SQUADRONS

PROJECT TITLE: FOLLOW-ON VARIANT

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

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Contract	199,922	172,200	115,000
b. Support Contract	4,390	1,200	1,080
c. In-House	124,704	85,968	100,127
d. GFE/Other	1,790	700	400
Total	330,806	260,068	216,607

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

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204136N

PROJECT NUMBER: E2130

PROGRAM ELEMENT TITLE: F/A-18 SQUADRONS

PROJECT TITLE: FOLLOW-ON VARIANT

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

PERFORMING ORGANIZATIONS:

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development										
Boeing MDA	SS/CPFF	3/92	81,785	81,785	81,785					81,785
St.Louis, MO	SS/CPIF/AF	7/92	3,869,744	3,869,744	3,403,944	129,600	143,000	106,000	87,200	3,869,744
	TBD	TBD	28,200	28,200	0	0	7,000	7,000	14,200	28,200
GE	SS/CPFF	3/92	51,500	51,500	51,500					51,500
Lynn, MA	SS/CPIF/AF	7/92	809,344	809,344	721,367	67,777	20,200	0	0	809,344
Hughes										
LA, CA	SS/CPFF	9/93	8,365	8,365	1,820	2,545	2,000	2,000	0	8,365
Other Contracts	Var	Var	20,214	20,214	20,214	0	0	0	0	20,214
NAWC Warminster	Var	Var	26,351	26,351	26,351	0	0	0	0	26,351
NAWC China Lake	Var	11/98	63,510	63,510	34,210	15,370	5,815	2,028	6,087	63,510
NAWC Lakehurst	Var	11/98	27,833	27,833	25,294	2,121	153	127	138	27,833
NADEP North Island	Var	11/98	10,072	10,072	9,286	738	48	0	0	10,072
NAWC Indianapolis	Var	11/98	14,290	14,290	8,667	625	2,077	1,616	1,305	14,290
Other Field Activities	Var	Var	37,793	37,793	22,629	1,836	3,637	4,098	5,593	37,793

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

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204136N

PROJECT NUMBER: E2130

PROGRAM ELEMENT TITLE: F/A-18 SQUADRONS

PROJECT TITLE: FOLLOW-ON VARIANT

PERFORMING ORGANIZATIONS (CONT.):

<u>Contractor/ Government Performing Activity</u>	<u>Contract Method/ Fund Type Vehicle</u>	<u>Award/ Oblig Date</u>	<u>Perform Activity EAC</u>	<u>Project Office EAC</u>	<u>FY 1996 &amp; Prior</u>	<u>FY 1997 Budget</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Support and Management										
Rail Co.										
Towson, MD	T&M	9/94	17,169	17,169	8,652	4,390	1,200	1,080	1,847	17,169
Misc Contracts	Var	11/98	11,855	11,855	11,855	0	0	0	0	11,855
Field Activities	Var	11/98	19,680	19,680	19,680	0	0	0	0	19,680
Test and Evaluation										
NAWC Pax River	Var	11/98	387,957	387,957	70,713	88,646	71,538	83,250	73,810	387,957
NASA Langley, VA	MIPR	N/A	6,874	6,874	4,444	1,730	700	0	0	6,874
Arnold Engineering Development Center										
Tulahoma, TN	MIPR	11/98	36,142	36,142	23,892	3,250	2,000	5,000	2,000	36,142
Other Field Activities	Var	Var	17,227	17,227	2,831	10,388	0	4,008	0	17,227

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

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204136N

PROJECT NUMBER: E2130

PROGRAM ELEMENT TITLE: F/A-18 SQUADRONS

PROJECT TITLE: FOLLOW-ON VARIANT

GOVERNMENT FURNISHED PROPERTY:

Item Description	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Delivery Date	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development									
GFE/Other	FFP	Var	Var	86,341	1,790	700	400	0	89,231
Support and Management									
				N/A					
Test and Evaluation									
				N/A					
Subtotal Product Development				4,493,408	222,402	184,630	123,269	114,523	5,138,232
Subtotal Support and Management				40,187	4,390	1,200	1,080	1,847	48,704
Subtotal Test and Evaluation				101,880	104,014	74,238	92,258	75,810	448,200
Total Project				4,635,475	330,806	260,068	216,607	192,180	5,635,136

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204136N

PROGRAM ELEMENT TITLE: F/A-18 SQUADRONS

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
E2350 F/A-18F TAC RECCE	0	2,911	43,409	45,106	16,496	3,553	62	0	111,537
RDT&E Articles				2					2

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The F/A-18F Super Hornet Advanced Reconnaissance Pod (SHARP) Program develops podded systems to provide timely, accurate imagery intelligence. This system, when installed on an F/A-18F serves as the follow-on tactical air reconnaissance aircraft to the interim F-14 Tactical Air Reconnaissance Pod System (TARPS). This program funds development and integration of a unique, F/A-18F podded reconnaissance system. This system includes electro-optical, infrared, and provisioning for Synthetic Aperture Radar (SAR) sensors to provide day/night, broad area coverage and high resolution images in over flight and at short and extended ranges. Imagery data is digitally recorded and can be data linked in near real time and/or returned to base to playback, analysis, processing, and storage.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204136N

PROJECT NUMBER: E2350

PROGRAM ELEMENT TITLE: F/A-18 SQUADRONS

PROJECT TITLE: F/A-18F TAC RECCE

A. (U) PROGRAM ACCOMPLISHMENTS AND PLANS:

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

2. (U) FY 1998 PLAN:

- (\$440) Commence initial Systems Engineering Design for SHARP Integration into the Operational Flight Program.
- (\$830) Conduct Preliminary Design Review for SHARP Pod Structure.
- (\$1,641) Collection of aircraft vibration data for F/A-18F design concept review, development of Interface Control Documents (ICDS) and risk reduction activities.

3. (U) FY 1999 PLAN:

- (U)(\$24,953) Commence design and development of F/A-18F Tactical Reconnaissance (TAC RECCE) System.
- (U)(\$2,171) Commence TAC RECCE System integration into the F/A-18F.
- (U)(\$7,174) Procure the sensors and GFE test equipment.
- (U)(\$9,111) Commence technical publication, support equipment, testing documentation and training plan development.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204136N

PROJECT NUMBER: E2350

PROGRAM ELEMENT TITLE: F/A-18 SQUADRONS

PROJECT TITLE: F/A-18F TAC RECCE

## B. (U) PROGRAM CHANGE SUMMARY

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	0	0	0
(U) Appropriated Value:	0	3,000	
(U) Adjustments from PRESBUDG:	0	+2,911	+43,409
(U) FY 1999 President's Budget Submit:	0	2,911	43,409

## (U) CHANGE SUMMARY EXPLANATION:

(U) Funding: This is a new project. The FY 1998 net increase of +\$2911 thousand reflects a Congressional add of +\$3,000 thousand to initiate the Tactical Air Reconnaissance Pod system for the F/A-18F and -\$89 thousand represents revised economic assumptions. The net increase of +\$43,409 thousand in FY 1999 is the funding required to begin the development and integration of a tactical reconnaissance system into the F/A-18F.

(U) Schedule: Development and testing of the Reconnaissance System will validate a design which successfully integrates this system into the F/A-18F aircraft.

(U) Technical: The reconnaissance mission is a new F/A-18F Operational Requirement. The F/A-18F Reconnaissance System provides mission flexibility because it can be installed by squadron personnel on any F/A-18F aircraft. Through use of a reliable, quickly installed system, the operational commander is not limited to specific aircraft to perform the reconnaissance mission. This system will integrate products derived from the Tactical Reconnaissance Program into a reliable system which can conduct all weather, day/night, near range or far range reconnaissance.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204136N

PROJECT NUMBER: E2350

PROGRAM ELEMENT TITLE: F/A-18 SQUADRONS

PROJECT TITLE: F/A-18F TAC RECCE

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

	<u>FY 1997</u> <u>ACTUAL</u>	<u>FY 1998</u> <u>ESTIMATE</u>	<u>FY 1999</u> <u>ESTIMATE</u>	<u>FY 2000</u> <u>ESTIMATE</u>	<u>FY 2001</u> <u>ESTIMATE</u>	<u>FY 2002</u> <u>ESTIMATE</u>	<u>FY 2003</u> <u>ESTIMATE</u>	<u>TO</u> <u>COMPLETE</u>	<u>TOTAL</u> <u>PROGRAM</u>
(U) PROCUREMENT:									
F/A-18F TAC RECCE									
(U) APN-1									
E/F	0	0	0	0	49,166	90,362	56,939	124,246	320,713

(U) RELATED RDT&E:

(U) PE 0603261N (Tactical Airborne Reconnaissance Program): Develops systems to provide timely and accurate imagery intelligence with Electro-Optical, Infrared and Synthetic Aperture Radar (SAR) sensors.

(U) PE 0206625M (Marine Corps Intelligence/Electronic Warfare System): Receives EO/IR/SAR imagery.

(U) SBIR Common Aperture Multi-Spectral Sensor and Night IR and Day EO in one sensor.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204136N

PROJECT NUMBER: E2350

PROGRAM ELEMENT TITLE: F/A-18 SQUADRONS

PROJECT TITLE: F/A-18F TAC RECCE

D. (U) SCHEDULE PROFILE:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>To Complete</u>
Program Milestones		3Q/NPR 3Q/MS-II		2Q-03/NPR 2Q-03/IOC (W)/LRIP I 3Q-03/MS-III
Engineering Milestones			3Q/Design Review	1Q-00/Vibration, Loads, EMI Flights
Test & Eval Milestones				3Q-4Q00/Commence TECHEVAL 1Q-2Q01/Commence Operational Assessment 1Q-03/OPEVAL
Contract Milestones			1Q/Contracts Awarded 1Q/Long Lead GFE	2Q-01/LRIP-I & II Decision

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

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204136N

PROJECT NUMBER: E2350

PROGRAM ELEMENT TITLE: F/A-18 SQUADRONS

PROJECT TITLE: F/A-18F TAC RECCE

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

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Contract	0	440	31,203
b. Support Contract	0	345	977
c. In-House	0	0	4,055
d. GFE/Other	0	2,126	7,174
Total	0	2,911	43,409

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

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204136N

PROJECT NUMBER: E2350

PROGRAM ELEMENT TITLE: F/A-18 SQUADRONS

PROJECT TITLE: F/A-18F TAC RECCE

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

PERFORMING ORGANIZATIONS:

Contractor/ Government Performing Activity Product Development	Contract Method Fund type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	FY 1996 & prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
TBD	SS/CPFF	10/98	57,558	57,558	0	0	440	31,203	25,915	57,558
NAWC China Lake	WX	11/98	19,448	19,448	0	0	490	2,171	16,787	19,448
Misc Field Activities	WX	11/98	3,108	3,108	0	0	345	976	1,787	3,108
Support and Management										
Misc Field Activities	WX	10/98	2,963	2,963	0	0	1,296	503	1,164	2,963
Test and Evaluation										
NAWC Pax River	WX	11/98	12,353	12,353	0	0	340	1,382	10,631	12,353
OPTEVFOR		11/01	2,850	2,850	0	0	0	0	2,850	2,850

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

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204136N

PROJECT NUMBER: E2350

PROGRAM ELEMENT TITLE: F/A-18 SQUADRONS

PROJECT TITLE: F/A-18F TAC RECCE

GOVERNMENT FURNISHED PROPERTY:

Item <u>Description</u>	Contract Method/ Fund Type <u>Vehicle</u>	Award/ Oblig Date	Delivery Date	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development									
GFE/Other	FFP	Var	Var	0	0	0	7,174	6,083	13,257
Support and Management									
				N/A					
Test and Evaluation									
				N/A					
				Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Subtotal Product Development				0	0	1,275	41,524	50,572	93,371
Subtotal Support and Management				0	0	1,296	503	1,164	2,963
Subtotal Test and Evaluation				0	0	340	1,382	13,481	15,203
Total Project				0	0	2,911	43,409	65,217	111,537

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DATE: February 1998

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204152N  
PROGRAM ELEMENT TITLE: E-2 SQUADRONS

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
E0463 E-2C IMPROVEMENTS	60,012	37,974	10,439	4,121	6,622	6,627	6,835	0	612,750
RDT&E ARTICLES	8	1							
E2321 E-2 RADAR MODERNIZATION PROGRAM	0	24,556	37,358	20,659	34,080	34,603	0	0	151,256
TOTAL	60,012	62,530	47,797	24,780	40,702	41,230	6,835	0	764,006

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: E-2C Improvements provides pre-planned product improvements for the evolution of E-2C airborne weapon system capabilities in support of naval warfare command and control requirements. It has previously funded developments for the modification/replacement of selected weapon replaceable assemblies of current installed subsystems. This has resulted in a new baseline capability configuration referred to as Group II aircraft. The current program is developing a Mission Computer Upgrade (MCU), applying on-going developments in data processing and target detection, which will relieve current bottlenecks in signal and data processing. The MCU will permit incorporation of additional functional capabilities to satisfy evolving operational requirements, e.g., Cooperative Engagement Capability (CEC), Satellite Communications (SATCOM) and permits the evolutionary growth of a Cruise Missile Defense (CMD) capability.

The Radar Modernization Program (RMP), initiates the application of new radar technologies which can be common to both seabased and landbased airborne early warning platforms, E-2C and E-3, to provide a definitive cruise missile defense capability. Focused technologies developed in association with the RMP will be cost shared by the Navy and Air Force. Funding shown in the RMP includes the Navy cost share. Key technologies to be applied are Space-Time Adaptive processing, an electronically scanable radar antenna with multi-channel rotary coupler, a solid state radar transmitter

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DATE: February 1998

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204152N  
PROGRAM ELEMENT TITLE: E-2 SQUADRONS

PROJECT NUMBER: E0463  
PROJECT TITLE: E-2C IMPROVEMENTS

and high dynamic range digital receivers. The resulting detection system will specifically provide an improved overland capability for CMD, advanced auto detect and track, a single beam cue to a shooter, Non-Cooperative Target Recognition classification technologies and enhanced E-2C CEC capabilities. These technologies and resultant equipment will be demonstrated in ground environment in FY 1997 and FY 1999 and flight tested in FY 2000 and FY 2001 leading to a potential Engineering and Manufacturing Development (EMD) start in 2001.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it encompasses engineering and manufacturing development for upgrade of existing, operational systems.

(U) COST: (Dollars in Thousands)

<u>PROJECT NUMBER &amp; TITLE</u>	<u>FY 1997 ACTUAL</u>	<u>FY 1998 ESTIMATE</u>	<u>FY 1999 ESTIMATE</u>	<u>FY 2000 ESTIMATE</u>	<u>FY 2001 ESTIMATE</u>	<u>FY 2002 ESTIMATE</u>	<u>FY 2003 ESTIMATE</u>	<u>TO COMPLETE</u>	<u>TOTAL PROGRAM</u>
E0463 E-2C IMPROVEMENTS	60,012	37,974	10,439	4,121	6,622	6,627	6,835	0	612,750
RDT&E ARTICLES	8	1							

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The mission computer upgrade (MCU), applying ongoing developments in data processing and target detection, will relieve current bottlenecks in signal and data processing and will permit incorporation of additional functional capabilities to satisfy evolving operational requirements, e.g., CEC and SATCOM, and permits the evolutionary growth of a Cruise Missile Defense (CMD) capability.

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DATE: February 1998

## FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204152N

PROJECT NUMBER: E0463

PROGRAM ELEMENT TITLE: E-2 SQUADRONS

PROJECT TITLE: E-2C IMPROVEMENTS

(U) COST: (Dollars in Thousands)

### A. (U) PROGRAM ACCOMPLISHMENTS AND PLANS:

#### 1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$4,061) Conducted environmental, maintainability and reliability qualification testing.
- (U) (\$4,138) Completed software system test for Build 0 and initiated and tested for Build 1.
- (U) (\$3,568) Conducted Developmental Testing(DT) / Operational Testing (OT)-IIA with airborne testing of hardware/software.
- (U) (\$17,020) Completed preproduction hardware fabrication and began deliveries.
- (U) (\$25,115) Continued MCU software development and CEC software interface. Updated software configuration, as necessary, from DT/OT IIA.
- (U) (\$6,110) Conducted MCU hardware integration and applicable aircraft modification and continued CEC hardware interface.

#### 2. (U) FY 1998 PLAN:

- (U) (\$8,020) Conduct DT/OT-IIB.
- (U) (\$5,100) Complete CEC software interface.

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DATE: February 1998

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204152N  
PROGRAM ELEMENT TITLE: E-2 SQUADRONS

PROJECT NUMBER: E0463  
PROJECT TITLE: E-2C IMPROVEMENTS

- (U) (\$5,470) Complete software system test for Build 1. Initiate Build 2.
- (U) (\$15,074) Conduct DT/OT-IIC Formal Qualification Testing.
- (U) (\$1,000) Conduct Test Readiness Review for FY99 Technical Evaluation/Operational Evaluation (TECHEVAL/OPEVAL).
- (U) (\$3,310) Complete test aircraft modifications.

3. (U) FY 1999 PLAN:

- (U) (\$5,367) Complete software system test for Build 2.
- (U) (\$500) Conduct Production Readiness Review.
- (U) (\$4,572) Conduct MCU TECHEVAL/OPEVAL.

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	62,012	39,380	10,266
(U) Appropriated Value:		39,380	
(U) Adjustments from PRESBUDG:	-2,000	-1,406	+173
(U) FY 1999 President's Budget Submit:	60,012	37,974	10,439

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DATE: February 1998

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204152N  
PROGRAM ELEMENT TITLE: E-2 SQUADRONS

PROJECT NUMBER: E0463  
PROJECT TITLE: E-2C IMPROVEMENTS

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY 1997 decrease reflects Small Business Innovation Research adjustments of -\$1,505 thousand and other minor program adjustments of -\$495 thousand. The FY 1998 adjustment of -\$1,406 thousand reflects contractor advisor reduction, general reduction, R&D general reduction and economic assumptions. The FY 1999 adjustment of +\$173 thousand reflects minor program adjustments and Navy Working Capital Fund (NWCF) surcharge corrections.

(U) Schedule: Not applicable

(U) Technical: Not applicable

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

	<u>FY 1997</u> <u>ACTUAL</u>	<u>FY 1998</u> <u>ESTIMATE</u>	<u>FY 1999</u> <u>ESTIMATE</u>	<u>FY 2000</u> <u>ESTIMATE</u>	<u>FY 2001</u> <u>ESTIMATE</u>	<u>FY 2002</u> <u>ESTIMATE</u>	<u>FY 2003</u> <u>ESTIMATE</u>	<u>TO</u> <u>COMPLETE</u>	<u>TOTAL</u> <u>PROGRAM</u>
APN 1/E-2C LI #10 & 11	295,400	311,676	389,331	380,572	316,689	261,362	212,057	164,900	2,872,347
APN 5/E-2C LI #34	27,059	42,813	91,502	76,444	47,134	65,367	53,794	CONTINUED	CONTINUED
APN 6/E-2C LI #48	2,007	6,017	20,034	10,285	4,167	2,785	5,709	11,867	66,108

(U) RELATED RDT&E:

(U) 0602232N (Command, Control and Communications Technology)

(U) 0602111N (Surface/Aerospace Survivability and Weapons Technology)

(U) 0603658N (Ship Self Defense, Cooperative Engagement) will fund the R&D efforts to integrate CE hardware/software into the E-2C. CE will also fund equipment, software and installation costs.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204152N  
PROGRAM ELEMENT TITLE: E-2 SQUADRONS

PROJECT NUMBER: E0463  
PROJECT TITLE: E-2C IMPROVEMENTS

D. (U) SCHEDULE PROFILE:	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>TO COMPLETE</u>	
Program Milestone					1Q/00 MCU MSIII
Engineering Milestones					
T&E Milestones		2Q/3Q MCU QUAL TESTS 3Q MCU DT/OT-IIA	2Q MCU DT/OT-IIB 4Q MCU DT/OT-IIC	2Q-3Q/99 MCU TECHEVAL 3Q/99 MCU OPEVAL	2Q/00 MCU FRP
Contract Milestones		3Q MCU LRIP			

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DATE: February 1998

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

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204152N  
PROGRAM ELEMENT TITLE: E-2 SQUADRONS

PROJECT NUMBER: E0463  
PROJECT TITLE: E-2C IMPROVEMENTS

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

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Hardware/Software Development	50,581	30,016	2,902
b. Contractor Engineering Support	4,000	2,042	2,090
c. Travel	55	55	55
d. Test and Evaluation	5,376	5,861	5,392
e. SBIR Assessment			
Total	60,012	37,974	10,439

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DATE: February 1998

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

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204152N  
PROGRAM ELEMENT TITLE: E-2 SQUADRONS

PROJECT NUMBER: E0463  
PROJECT TITLE: E-2C IMPROVEMENTS

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

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1996 & Prior	FY 1997 Actual	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development										
GAC (MCU)	SS/CPIF	11/94	155,180	155,180	71,681	50,581	30,016	2,902	0	155,180
GAC (CEC)	SS/CPFF	10/95	12,194	12,194	12,194	0	0	0	0	12,194
GAC (Other)	SS/CPFF	8/95	38,103	38,103	13,898	0	0	0	24,205	38,103
Miscellaneous GAC (Prior Yr. Efforts)	SS/CPFF Var.	12/95 Var.	671 254,800	671 254,800	671 254,800	0	0	0	0	671 254,800
Support and Management										
NAWCAD, PAX (MCU only)	WX/RC	10/98	17,142	17,142	8,845	4,055	2,097	2,145	0	17,142
NAWCAD, PAX (Prior Yr. Efforts)	WX/RC	Var.	58,800	58,800	58,800					58,800
SPAWAR	PD	Var.								
Test and Evaluation										
NAWCAD, PAX (MCU only)	WX/RC	10/98	34,494	34,494	17,865	5,376	5,861	5,392		34,494
NAWCAD, PAX (Prior Yr. Efforts)	WX/RC	Var.	39,200	39,200	39,200					39,200
PMRF, HAWAII	WX	8/96	1,500	1,500	1,500	0	0	0	0	1,500
Miscellaneous	MIPR	1/97	666	666	666	0	0	0	0	666

GOVERNMENT FURNISHED PROPERTY: NOT APPLICABLE

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

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204152N

PROJECT NUMBER: E0463

PROGRAM ELEMENT TITLE: E-2 SQUADRONS

PROJECT TITLE: E-2C IMPROVEMENTS

	<u>Total 1996 &amp; Prior</u>	<u>FY 1997 Actual</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Subtotal Production Development	353,244	50,581	30,016	2,902	24,205	460,948
Subtotal Support and Management	67,645	4,055	2,097	2,145	0	75,942
Subtotal Test and Evaluation	59,231	5,376	5,861	5,392	0	75,860
SBIR Assessment						
Total Project	480,120	60,012	37,974	10,439	24,205	612,750

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FY 1998 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204152N  
PROGRAM ELEMENT TITLE: E-2 SQUADRONS

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
E2321 E-2 RADAR MODERNIZATION PROGRAM	0	24,556	37,358	20,659	34,080	34,603	0	0	151,256

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Radar Modernization Program (RMP), initiates the application of new radar technologies which can be common to both seabased and landbased airborne early warning platforms, E-2C and E-3, to provide a definitive cruise missile defense capability. Focused technologies developed in association with the RMP will be cost shared by the Navy and Air Force. Funding shown in the RMP includes the Navy cost share. Key technologies to be applied are Space-Time Adaptive Processing, an electronically scanable radar antenna with multi-channel rotary coupler, a solid state radar transmitter and high dynamic range digital receivers. The resulting detection system will specifically provide an improved overland capability for Cruise Missile Defense (CMD), advanced auto detect and track, a single beam cue to a shooter, Non-Cooperative Target Recognition classification technologies and continue to enhance E-2C CEC capabilities. These technologies and resultant equipment will be demonstrated in ground environment in FY 1997 and FY 1999 and flight tested in FY 2000 and FY 2001 leading to a planned Engineering and Manufacturing Development start in 2001.

A. (U) PROGRAM ACCOMPLISHMENTS AND PLANS

1. (U) FY 1997: NOT APPLICABLE
2. (U) FY 1998 PLAN:

- (U) (\$14,771) Commence advanced sensor common component design and fabrication for CMD.

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## FY 1998 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204152N

PROJECT NUMBER: E2321

PROGRAM ELEMENT TITLE: E-2 SQUADRONS

PROJECT TITLE: RADAR MODERNIZATION PROGRAM

- (U) (\$7,093) Commence flight test and instrumentation hardware design and fabrication. Procure off the shelf instrumentation parts. Develop instrumentation package evaluation and checkout capability including related test equipment.
- (U) (\$1,346) Flight hardware and instrumentation software development.
- (U) (\$1,346) Aircraft integration design. Initiate aircraft preparation (environmental subsystems).

### 3. (U) FY 1999 PLAN:

- (U) (\$7,353) Complete advanced sensor common component design and fabrication. Commence integration of components into applicable sensors.
- (U) (\$13,459) Complete hardware and instrumentation package fabrication.
- (U) (\$3,478) Complete software integration package.
- (U) (\$3,478) Install aircraft integration modifications
- (U) (\$6,403) Conduct RMP testing at Pacific Missile Range Facility.
- (U) (\$3,187) Conduct test and evaluation of flight test and instrumentation system.

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FY 1998 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204152N  
PROGRAM ELEMENT TITLE: E-2 SQUADRONS

PROJECT NUMBER: E2321  
PROJECT TITLE: RADAR MODERNIZATION PROGRAM

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	0	25,472	37,881
(U) Appropriated Value:		25,472	
(U) Adjustments from Pres Budget:	0	-916	-523
(U) FY 1998 President's Budget Submit:	0	24,556	37,358

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY 1998 adjustment of -\$916 thousand and the FY 1999 adjustment of -\$523 thousand reflects adjustments for contract advisor reductions, general reductions, R&D general reductions, and economic adjustments.

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands) NOT APPLICABLE

(U) RELATED RDT&E:

(U) PE 0603238N (Precision Strike And Air Defense Advanced Technology) will fund the R&D effort to integrate existing RMP technologies at the Pacific Missile Range Facility to include in the Cruise Missile Defense Phase II FY 97 demonstration and data collection.

D. (U) SCHEDULE PROFILE: NOT APPLICABLE (Non Acquisition Program)

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FY 1998 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204152N  
PROGRAM ELEMENT TITLE: E-2 SQUADRONS

PROJECT NUMBER: E2321  
PROJECT TITLE: RADAR MODERNIZATION PROGRAM

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

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Hardware/Software Development	0	21,931	33,858
b. Contractor Engineering Support	0	1,381	1,445
c. Travel	0	55	55
d. Test and Evaluation	0	1,189	2,000
Total	0	24,556	37,358

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

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development										
GAC (Other)	SS/TBD	02/98	52,760	52,760	0		16,331	21,306	15,123	52,760
GAC (RMP)	SS/TBD	11/98	73,771	73,771	0		0	12,552	61,219	73,771
HANSCOM										
AFB (Other)	MIPR	02/98	4,900	4,900	0		4,900	0	0	4,900
HANSCOM										
AFB (RMP)	MIPR	02/98	700	700	0		700	0	0	700
Support and Management										
NAWCAD,										
PAX RV	WX/RX	10/97	10,136	10,136	0	0	1,436	1,500	7,200	10,136
Test and Evaluation										
NAWCAD,										
PAX RV	WX/RX	10/97	8,989	8,989	0	0	1,189	2,000	5,800	8,989

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DATE: February 1998

FY 1998 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204152N  
PROGRAM ELEMENT TITLE: E-2 SQUADRONS

PROJECT NUMBER: E2321  
PROJECT TITLE: RADAR MODERNIZATION PROGRAM

GOVERNMENT FURNISHED PROPERTY: NOT APPLICABLE

	<u>Total FY 1996 &amp; Prior</u>	<u>FY 1997 Actual</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Subtotal Production Development	0	0	21,931	33,858	76,342	132,131
Subtotal Support and Management	0	0	1,436	1,500	7,200	10,136
Subtotal Test and Evaluation	0	0	1,189	2,000	5,800	8,989
Total Project	0	0	24,556	37,358	89,342	151,256

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204163N

PROGRAM ELEMENT TITLE: Fleet Communications

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
X0725 Communication Automation	1,675	1,600	1,805	1,848	1,895	1,938	1,988	CONT	CONT
X2074 Communications Support Systems	3,255	1,746	0	0	0	0	0		
X1083 Shore to Ship Communications System	12,107	12,134	13,768	7,789	7,493	6,597	6,775	CONT	CONT
X0795 Support of MEECN	586	481	724	697	710	722	736	CONT	CONT
TOTAL	17,623	15,961	16,297	10,334	10,098	9,257	9,499	CONT	CONT

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Communication Automation program developed an anti-jam radio system incorporating shipboard interfaces, interface mitigation, radio frequency distribution (including antennas), high speed burst data transmission and relocatable Very High Frequency (VHF) relay. The Communications Support Systems (CSS) develops the architecture for an integrated Navy communication system for Ship-to-Shore and Shore-to-Ship communications defined as the Copernicus TADIXS and prototypes early operational capabilities and incremental implementation and fielding of CSS capabilities. The Shore to Ship Communications System develops communications systems elements which provide positive command and control of deployed ballistic missile submarines (SSBNs). Minimum Essential Emergency Communications Network (MEECN) is the Tri-Service transmission system which ensures delivery of Emergency Action Messages (EAM) to our strategic platforms.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it encompasses engineering and manufacturing development for upgrade of existing, operational systems.

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Budget Item Justification

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204163N  
PROGRAM ELEMENT TITLE: Fleet Communications

PROJECT NUMBER: X0725  
PROJECT TITLE: COMMUNICATION  
AUTOMATION

(U) COST: (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
X0725 Communication Automation	1,675	1,600	1,805	1,848	1,895	1,938	1,988	CONT	CONT

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project is a continuing program that provides for automating and communications upgrades for Fleet Tactical Communications. Navy Modular Automated Communications System (NAVMACS) automates the message receiving, distribution and preparation functions aboard ships.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$820) NAVMACS: Continue DMS Tactical Afloat efforts. Continue accommodation to C3 technology to include ADNS. Integrate to TAC-4 hardware. Begin development of connectionless protocols to support Tactical DMS Afloat. Begin integration, test and evaluation of DMS components. Develop limited DMS (unclassified) point-to-point protocol. Integrate, test & evaluate SSIXS protocol.
- (U) (\$805) Develop connectionless protocols and time-shared link protocol to support DMS over various RF paths to include UHF LOS.
- (U) (\$50) Develop and update Naval Command, Control Communications, Computers, Intelligence, Sensors and Reconnaissance to incorporation overarching operational, systems, technical and information architectures. Conduct associated C4ISR analyses and studies.

2. (U) FY 1998 PLAN:

- (U) (\$1,570) NAVMACS: Continue DMS Tactical Afloat research and development efforts. Provide Test and Evaluation of DMS protocols. Continue integration of DMS components. Develop interfaces for classified DMS (MISSI Guards). Establish full message profiling. Develop co-hosting of DMS Multifunctional Interpreter (MDI). Integrate/co-host DMS intermediate Message Transfer Agent (IMTA). Conduct TAC-5 component research/interface development.

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Budget Item Justification

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204163N  
PROGRAM ELEMENT TITLE: Fleet Communications

PROJECT NUMBER: X0725  
PROJECT TITLE: COMMUNICATION  
AUTOMATION

- (U) (\$30) Develop and update Naval Command, Control Communications, Computers, Intelligence, Sensors and Reconnaissance to incorporation overarching operational, systems, technical and information architectures. Conduct associated C4ISR analyses and studies.

3. (U) FY 1999 PLAN:

- (U) (\$1,805) NAVMACS: Continue DMS Tactical afloat migration efforts. Continue accommodation of emergent technology. Integrate Broadcast DMS (X.400 protocol). Begin TAC-5 hardware integration and test & evaluation. Initiate "Smart Push - Warrior Pull" features. Conduct Test and Evaluation of DMS MISSI Guards. Integrate co-hosting of DMS Programmable User Agent (PUA). Integrate co-hosting of DMS Message Store (MS).

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget	1,712	1,650	3,152
(U) Adjustments from FY 1998 PRESBUDG:	-37	-50	-1,347
(U) FY 1999 President's Budget Submit:	1,675	1,600	1,805

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1997 adjustment is due to programmatic adjustments +8K, Small Business Innovation Research(SBIR) transfer -\$43K, and revised economic assumptions -\$2K. FY 1998 adjustment due to Congressional Undistributed General Reductions -\$46K, and revised economic assumptions -\$4K. FY 1999 adjustment due to -\$50K redirected to develop and update overarching C4ISR requirements, adjustment for unjustified level of effort program growth -\$1,271K, Navy Capital Working Fund adjustment -\$3K, and Congressional Undistributed General Reductions -\$23K.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204163N  
PROGRAM ELEMENT TITLE: Fleet Communications

PROJECT NUMBER: X0725  
PROJECT TITLE: COMMUNICATION  
AUTOMATION

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

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

NUMBER TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
(U) OPN Line 3050 Ship Communications Automation (NAVMACS Project Unit)	5,367	6,554	28,345	30,179	18,414	43,965	29,197	CONT	CONT

(U) RELATED RDT&E: Not Applicable.

D. (U) SCHEDULE PROFILE: Not Applicable.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0204163N  
PROGRAM ELEMENT TITLE: Fleet Communications

PROJECT NUMBER: X2074  
PROJECT TITLE: Communications Support Systems (CSS)

(U) COST: (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
X2074 Communication Support Systems	3,255	1,746	0	0	0	0	0	0	10,042

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project is an initiative to develop the Copernicus architecture and implementation concept, an integrated Navy information system architecture based on shared use of links and multimedia networks. It will provide increased communication survivability, throughput and security. The Copernicus system concept will further integrate the approach to research, development, acquisition and deployment of a total Command, Control and Communications Intelligence (C3I) system supporting Navy missions. The work to be performed is a system engineering effort that generates engineering solutions and guidelines, prototyping and early operational capabilities, and transition plans for incremental fielding involving all current and planned Navy communication systems.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$1,497) Initiated architectural and system engineering efforts leading to incremental design and implementation of CSS and JMCIS integration in accordance with the phased Copernicus...Forward, Naval C4I Implementation Plan.
- (U) (\$749) Supported fielding of Joint Maritime Communications System (JMCOMS) Build 1.
- (U) (\$1,009) Built, tested, and demonstrated JMCOMS Builds 2 and 3 including implementation and testing of IF RF network.

2. (U) FY 1998 PLAN:

- (U) (\$698) Support field of JMCOMS Build 2.
- (U) (\$1,048) Build, test, demonstrate and support fielding of JMCOMS Build 3.

3. (U) FY 1999 Plan: Not applicable.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0204163N  
PROGRAM ELEMENT TITLE: Fleet Communications

PROJECT NUMBER: X2074  
PROJECT TITLE: Communications  
Support Systems (CSS)

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	3,418	4,209	6,596
(U) Appropriated Value:			
(U) Adjustments from FY 1998 PRESBUDG:	-163	-2,463	-6,596
(U) FY 1999 President's Budget Submit:	3,255	1,746	0

(U) CHANGE SUMMARY EXPLANATION:

(U) FY 1997: Reflects programmatic adjustments (\$-115K), Small Business Innovation Research (SBIR) program transfer (\$-44K), and \$-4K for Revised Economic Assumptions. {total: \$-163K}

(U) FY 1998: Reflects adjustments for Truncated Program (\$-2,409K), Congressional Undistributed General Reductions (\$-150K), and Revised Economic Adjustments (\$-4K). {total: \$-2,463K}

(U) FY 1999: \$-6,596K Program Terminated

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

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

(U) RELATED RDT&E: PE 0205604N (Tactical Data Links)  
PE 0303109N (Satellite Communications)  
PE 0303140N (Information Systems Security Plan)

D. (U) SCHEDULE PROFILE: Not applicable.

R-1 Line Item 155

# UNCLASSIFIED

Budget Item Justification  
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# UNCLASSIFIED

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0204163N      PROJECT NUMBER: X1083  
PROGRAM ELEMENT TITLE: Fleet Communications      PROJECT TITLE: Shore to Ship  
Communication Systems

(U) COST: (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
X1083 Shore to Ship Communication Systems	12,107	12,134	13,768	7,789	7,493	6,597	6,775	CONT	CONT

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project develops communications systems elements which provide positive command and control of deployed ballistic missile submarines (SSBNs). This program provides enhancements to the shore-to-ship transmitting systems, shipboard receiver systems, and development of the Submarine Low Frequency (LF)/Very Low Frequency (VLF) Versa Module Eurocard (VME) Receiver (SLVR) System (formerly the Advanced VLF/LF VME (AVR/VME) receiver system). Continuing evaluation of this communications system is provided via the Strategic Communications Assessment Program (SCAP). Fixed VLF/LF develops an energy efficient, solid state, power amplifier replacement (SSPAR) for the VLF shore based transmitters of the Submarine Broadcast System, investigates improvement of the radio frequency high voltage insulators, bushings and antenna components used in these stations through the High Voltage Insulator Program (HVIP) and measures and signal propagation through the Coverage Prediction Improvement Program (CPIP).

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$317) High Voltage and antenna component development and test.
- (U) (\$6,669) Complete SLVR TECHEVAL, start integration of KG-38 replacement.
- (U) (\$1,711) Complete SSPAR E&MDM on site training.
- (U) (\$109) Complete SLVR CSS Phase I integration.
- (U) (\$2,906) Continue SCAP and CEP.
- (U) (\$395) Develop and update Naval Command, Control, Communications, Computers, Intelligence, Sensors and Reconnaissance (C4ISR) implementation guidance.

R-1 Line Item 155

# UNCLASSIFIED

Budget Item Justification

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# UNCLASSIFIED

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0204163N  
PROGRAM ELEMENT TITLE: Fleet Communications

PROJECT NUMBER: X1083  
PROJECT TITLE: Shore to Ship  
Communication Systems

2. (U) FY 1998 PLAN:

- (U) (\$350) Continue high voltage and antenna component development and test.
- (U) (\$6,079) Complete SLVR OPEVAL, Milestone III, and complete integration and laboratory test of the KG-38 replacement and begin SLVR P3I.
- (U) (\$1,445) Begin CSS Phase II integration.
- (U) (\$3,624) Continue SCAP and conduct continuing evaluation of CEP.
- (U) (\$254) Develop and update Naval Command, Control, Communications, Computers, Intelligence, Sensors and Reconnaissance (C4ISR) implementation guidance.

3. (U) FY 1999 PLAN:

- (U) (\$370) Continue high voltage and antenna component development and test.
- (U) (\$6,449) Continue SLVR P3I efforts.
- (U) (\$885) Continue CSS Phase II integration.
- (U) (\$3,634) Continue SCAP and conduct continuing evaluations of CEP.
- (U) (\$2,800) Install and test SSPAR Engineering and Manufacture Development Model at La Moure, N.D.

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	13,334	12,982	12,767
(U) Appropriated Value:			
(U) Adjustments from FY 1998 PRESBUDG:	-1,227	-848	+1,001
(U) FY 1999 President's Budget Submit	12,107	12,134	13,768

R-1 Line Item 155

# UNCLASSIFIED

Budget Item Justification  
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# UNCLASSIFIED

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0204163N  
 PROGRAM ELEMENT TITLE: Fleet Communications

PROJECT NUMBER: X1083  
 PROJECT TITLE: Shore to Ship  
 Communication Systems

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding:

FY 1997: Reflects SBIR transfer (\$-204K), FFRDC reduction (\$-78K), realignment to other higher Navy priorities (\$-905K), and revised economic assumptions (\$-40K). {total: \$-1,227K}  
 FY 1998: Reflects FFRDC reduction (\$-29K), Congressional undistributed general reductions (\$-39K), revised economic assumptions (\$-29K), and programmatic adjustments of (\$-400K). {total \$-848K}  
 FY 1999: Reflects programmatic adjustment of \$+2,800K for SSPAR install and test, \$-281K for SCAP efforts, \$-772K for IT21 reductions, \$-245K for BSO realignment, \$-140 for programmatic adjustments, \$-218K for Congressional Undistributed General Reductions, and \$-143K for NWCF adjustments. {total: \$+1,001K}

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

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

NUMBER TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
(U) OPN Line 3107 Shore LF									
	3,060	7,571	13,028	19,116	16,681	19,252	4,008	CONT	CONT
(U) OPN Line 3147 Advanced VLF Receiver									
	0	7,465	17,171	19,790	17,853	3,733	504	CONT	CONT
(U) O&M,N									
	24,713	24,638	24,964	19,271	18,235	18,639	19,152	CONT	CONT
(U) RELATED RDT&E:	0604503N								

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# UNCLASSIFIED

Budget Item Justification

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0204163N  
PROGRAM ELEMENT TITLE: Fleet Communications

PROJECT NUMBER: X1083  
PROJECT TITLE: Shore to Ship  
Communication Systems

D. (U) SCHEDULE PROFILE:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
Program Milestones		2Q SLVR MS III	
Engineering Milestones			
T&E Milestones	4Q SLVR TECHEVAL(DTIIC)	1Q SLVR OPEVAL(OT-IIB)	1Q SLVR P3I(OT-III)
Contract Milestones			

R-1 Line Item 155

# UNCLASSIFIED

Budget Item Justification  
(Exhibit R-2, Page 10 of 16)

# UNCLASSIFIED

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

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204163N

PROJECT NUMBER: X1083

PROGRAM ELEMENT TITLE: Fleet Communications

PROJECT TITLE: Shore to Ship

Communication Systems

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

PROJECT COST CATEGORIES	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Project Management	739	766	908
b. Systems Engineering	3,404	3,313	3,848
c. Software Development	2,328	2,159	2,648
d. Hardware Development	4,798	4,987	5,340
e. System Test & Evaluation	500	519	611
f. Integrated Logistic Spt	114	136	138
g. Site/Platform Integration	224	254	275
TOTAL	12,107	12,134	13,768

R-1 Line Item 155

# UNCLASSIFIED

Budget Item Justification

(Exhibit R-3, Page 11 of 16)



# UNCLASSIFIED

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

DATE: February 1998

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0204163N  
 PROGRAM ELEMENT TITLE: Fleet Communications

PROJECT NUMBER: X1083  
 PROJECT TITLE: Shore to Ship  
 Communication Systems

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

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development										
U.S. Army Monmouth, NJ	WX	2/96	N/A	N/A	2,747	425	434	444	CONT	CONT
Misc Contracts	Various	Var	N/A	N/A	1,705	437	546	327	CONT	CONT
APL/JHU Baltimore, MD	CPFF	10/95	N/A	N/A	5,098	3,006	3,624	3,634	CONT	CONT
NCCOSC NRaD San Diego, CA	WX	10/95	N/A	N/A	15,055	3,903	6,631	8,098	CONT	CONT
ROCKWELL Richardson, TX	CPFF	12/93	11,287	11,287	10,113	1,711	0	0	0	11,824
TBD CONTRACTOR Miscellaneous Labs	FPIP Various	10/95	N/A	N/A	896	1,300 113	576	935	CONT	CONT

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# UNCLASSIFIED

Budget Item Justification  
 (Exhibit R-3, Page 12 of 16)

# UNCLASSIFIED

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

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204163N

PROJECT NUMBER: X1083

PROGRAM ELEMENT TITLE: Fleet Communications

PROJECT TITLE: Shore to Ship  
Communication Systems

<u>Contractor/ Government Performing Activity</u>	<u>Contract Method/ Fund Type Vehicle</u>	<u>Award/ Oblig Date</u>	<u>Perform Activity EAC</u>	<u>Project Office EAC</u>	<u>Total FY 1996 &amp; Prior</u>	<u>FY 1997 Budget</u>	<u>FY 1998 Budget</u>	<u>FY 99 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Support and Management										
Miscellaneous	Various	10/95	866	866	597	812	323	330	0	1,615
Test and Evaluation										
Miscellaneous	Various	10/95	1,215	1,215	432	400	0	0	0	1,215

GOVERNMENT FURNISHED PROPERTY: Not applicable.

	<u>FY 1997 Budget</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Subtotal Product Development	10,895	11,811	13,438	CONT	CONT
Subtotal Support and Management	812	323	330	0	1,615
Subtotal Test and Evaluation	400	0	0	0	1,215
Total Project	12,107	12,134	13,768	CONT	CONT

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# UNCLASSIFIED

Budget Item Justification  
(Exhibit R-3, Page 13 of 16)

# UNCLASSIFIED

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0204163N  
PROGRAM ELEMENT TITLE: Fleet Communications

PROJECT NUMBER: X0795  
PROJECT TITLE: MEECN

(U) COST: (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
X0795 MEECN	586	481	724	697	710	722	736	CONT	CONT

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: Support of Minimum Essential Emergency Communications Network (MEECN). MEECN is the Tri-Service transmission system which ensures delivery of Emergency Action Messages (EAMs) to our strategic platforms. Because of substantial downsizing in the number of MEECN assets, such as the CINC Airborne Command Post (ABNCP) fleet, it is necessary to improve the range, timeliness and reliability of MEECN communications to maintain connectivity to the platforms. This project identifies, researches, and develops improvements to the MEECN primarily in the Very Low Frequency and Low Frequency (VLF/LF) ranges of MEECN. The MEECN Message Processing Mode (MMPM), which reduces transmission time while improving message delivery reliability at greater ranges, was developed under this project and is being implemented in the MEECN VLF/LF Systems. The new High Data Rate (HIDAR) mode, which greatly reduces message transmission time while providing the performance of low data rate modes, has been deployed. Potential improvements in mode design and signal processing are continually being investigated for MEECN application.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$162) Improved HIDAR synchronization processing to reduce the number of false detections to a Fleet acceptable frequency of occurrence. Assisted in incorporating the change into EVS Software Release 7.8.
- (U) (\$157) Continued development of the MEECN Integrated Test Bed (MITB) used for development of MEECN improvements and for Certification Testing of new MEECN Mode implementations in strategic systems.
- (U) (\$148) Investigated technological advancements (eg; Turbo Codes) for application to MEECN Mode development/improvements.
- (U) (\$52) Continued data collection and analysis of wideband atmospheric noise for use in developing and testing wideband VLF/LF receivers.
- (U) (\$30) Assisted in transitioning HIDAR type processing to the Fixed VLF (FVLF) Range Extension Mode (REM).

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BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204163N  
PROGRAM ELEMENT TITLE: Fleet Communications

PROJECT NUMBER: X0795  
PROJECT TITLE: MEECN

- . (U) (\$17) Coordinated multi-service crypto replacement activities in response to CJCS Instruction 6510.01(C) of 3 Oct 95.
  - . (U) (\$20) Develop and update Naval Command, Control, Communications, Computers, Intelligence, Sensors and Reconnaissance (C4ISR) implementation guidance.
2. (U) FY 1998 PLAN:
- . (U) (\$241) Complete MITB development.
  - . (U) (\$146) Continue Turbo Code application to MEECN Modes.
  - . (U) (\$50) Continue atmospheric noise data collection and analysis.
  - . (U) (\$20) Support SLVR and MMRT MPM and HIDAR certification testing in the MITB.
  - . (U) (\$15) Continue crypto replacement coordination.
  - . (U) (\$9) Develop and update Naval Command, Control, Communications, Computers, Intelligence, Sensors and Reconnaissance (C4ISR) implementation guidance.
3. (U) FY 1999 PLAN:
- . (U) (\$293) Continue Turbo Code application to MEECN Modes.
  - . (U) (\$215) Initiate development of improved MEECN Mode 15.
  - . (U) (\$161) Initiate study to integrate NONAP and Signal Separator AJ algorithms.
  - . (U) (\$40) Investigate HIDAR/Block II compatibility.
  - . (U) (\$15) Continue crypto replacement coordination.

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# UNCLASSIFIED

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

DATE: February 1998

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0204163N  
PROGRAM ELEMENT TITLE: Fleet Communications

PROJECT NUMBER: X0795  
PROJECT TITLE: MEECN

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	674	495	774
(U) Appropriated Value:			
(U) Adjustments from FY 1998 PRESBUDG:	-88	-14	-50
(U) FY 1999 Congressional Budget Submit:	586	481	724

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding:

FY 1997: Reflects SBIR transfer -\$12K, programmatic adjustments (\$-75K), and revised economic assumptions (\$-1K). {total: \$-88K}  
FY 1998: Reflects revised economic assumptions (\$-1K) and congressional undistributed general reductions (\$-13K). {total: \$-14K}  
FY 1999: Reflects redirection of funds to develop and update overarching C4ISR mission requirements (\$-12K), unjustified level of effort program growth adjustment (\$-23K), and NWCF adjustment (\$-2K), and revised economic assumption (\$-13K). {total: \$-50K}

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

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

(U) RELATED RDT&E: Not applicable.

D. (U) SCHEDULE PROFILE: Not applicable.

R-1 Line Item 155

# UNCLASSIFIED

Budget Item Justification  
(Exhibit R-2, Page 16 of 16)

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FY 1999 RDT&E,N PRESIDENT'S BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204229N

PROGRAM ELEMENT TITLE: TOMAHAWK AND THEATER MISSION PLANNING CENTER

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
A0545 TOMAHAWK	133,256	85,768	64,159	36,514	7,996	1,583	1,772	CONT.	CONT.
A1784 THEATER MISSION PLANNING CENTER	5,553	2,992	2,568	1,934	1,922	22	28	0	96,914
TOTAL	138,809	88,760	66,727	38,448	9,918	1,605	1,800	CONT.	CONT.
RDT&E Articles		2	3	3					

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION

(U) The TOMAHAWK Weapons System (TWS) provides the Tomahawk cruise missile attack capability against targets on land (Tomahawk Land Attack Missile (TLAM)). The TLAM can be fitted with either Conventional unitary warhead (TLAM/C), Nuclear warhead (TLAM/N) or submunition Dispenser (TLAM/D). This program ensures that the TWS exploits state-of-the-art technology to preserve the efficiency of this proven weapon system.

(U) The Tomahawk project includes all missile development; mission planning system development, and submarine and surface ship weapons control development.

(U) The Tomahawk TLAM Block III system upgrade (IOC March 93) incorporated the Global Positioning System (GPS) capability; provided a smaller, lighter warhead, extended range, Time of Arrival, and improved accuracy for low contrast matching of Digital Scene Matching Area Correlator. The Advanced Tomahawk Weapons Control System (ATWCS) and Tomahawk Baseline Improvement Program (TBIP) Phase I will provide a quick reaction response capability as well as improved flexibility, accuracy and lethality.

(U) The Theater Mission Planning Center (TMPC) project provides for the TMPC and the Afloat Planning System (APS), a shipboard version of TMPC. TMPC and APS provide mission planning and employment support information for both the nuclear (TMPC only) and conventional TLAM. The TMPC/APS software development decreases mission planning time and increases the quality and accuracy of each mission. TMPC provides mission planning at the theater level and is designed for high rate production responsive to national/strategic requirements. APS provides mission planning at the Battle Group level that is responsive

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

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204229N

PROGRAM ELEMENT TITLE: TOMAHAWK AND THEATER MISSION PLANNING CENTER

to the needs of the tactical situation. Tomahawk Strike Planning Tools are comprised of two elements. The Mission Distribution System (MDS) is a subset of TMPC and APS also deployed as the standalone TLAM employment system, that support the effective employment of TLAM by the Force Level Tomahawk Strike Coordinator (TSC). The Electronic Tomahawk Employment Planning Package (ETEPP) provides the Tomahawk user with command and control information needed to employ Tomahawk missions.

(U) These efforts provide battle-group tactical flexibility and responsiveness while maximizing TWS wartime capability.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it encompasses engineering and manufacturing development for upgrade of existing operational systems.

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Exhibit R-2, RDT&E Budget Item Justification  
(Exhibit R-2, Page 2 of 18)

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FY 1999 RDT&E,N PRESIDENT'S BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204229N

PROJECT NUMBER: A0545

PROGRAM ELEMENT TITLE: TOMAHAWK AND  
THEATER MISSION PLANNING CENTER

PROJECT TITLE: TOMAHAWK

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
A0545 TOMAHAWK	133,256	85,768	64,159	36,514	7,996	1,583	1,772	CONT.	CONT.
CURRENT ACTUAL PROGRAM VALUE	133,256								
RDT&E Articles		2	3	3					

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The TOMAHAWK Cruise Missile provides an attack capability against targets on land (TOMAHAWK Land-Attack Missile (TLAM)). The TLAM can be fitted with either Conventional unitary warhead (TLAM/C), Nuclear warhead (TLAM/N) or submunition Dispenser (TLAM/D).

(U) The Tomahawk development encompasses TLAM C/D Block III (BLK III) upgrade, the TBIP and ATWCS surface and submarine. The BLK III effort incorporates the GPS capability; provides a smaller, lighter warhead, extended range, Time of Arrival; and upgrades the Digital Scene Matching Area Correlater accuracy for low contrast matching. The ATWCS allows for increased data throughout, resulting in significant reductions in the time required to execute missile preparation and launch sequences, and provides improved strike coordination capability, increased tactical flexibility and responsiveness. The ATWCS development is accomplished in three upgrades and is a prerequisite for TBIP: the ATWCS Track Control Group (TCG); the ATWCS Launch Control Group (LCG); and the Submarine Block III Phase III which installs ATWCS on submarines. The TBIP development provides a comprehensive baseline upgrade to the TWS to improve system flexibility, responsiveness, accuracy and lethality. Essential elements of the TBIP include upgrades to the guidance, navigation, control, and mission computer systems of the missile, along with the associated Command and Control (C2) systems and weapons control systems. TBIP will provide a UHF SATCOM data link to enable the missile to receive in-flight mission modification messages, to transfer health and status messages and to broadcast Battle Damage Indication (BDI) messages. TBIP also includes the development of a high anti-jam GPS receiver and antenna system for the missile.

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

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204229N

PROJECT NUMBER: A0545

PROGRAM ELEMENT TITLE: TOMAHAWK AND  
THEATER MISSION PLANNING CENTER

PROJECT TITLE: TOMAHAWK

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$4,620) Achieved ATWCS LCG Low Rate Initial Production (LRIP). Continued ATWCS LCG Initial Operational Capability (IOC) software design/development. Conducted ATWCS TCG Land Based Systems Integration Testing/Ship Based Integration Testing (LBSIT/SBSIT)/TECHEVAL/OPEVAL.
- (U) (\$8,300) Conducted Sub ATWCS TECHEVAL/OPEVAL. Commenced development of Sub ATWCS for Combat Control System (CCS) MK2 Block 1C upgrade.
- (U) (\$120,336) Continued other elements of TBIP Engineering Manufacturing Development (EMD) including mission planning and weapons control systems upgrades. Performed missile component qualification and component/missile level Critical Design Reviews (CDRs). Continued development of data link and C2 capability through Preliminary Design Review (PDR). Initiated development of route planning and imagery handling capabilities in support of the restructured Phase 1 program. Performed prototyping and fleet demonstrations. Completed lab test communications and performed live testing to and from representative sites. Continued ATWCS for TBIP software development and conducted segment requirements and design reviews.

2. (U) FY 1998 PLAN:

- (U) (\$311) Commence ATWCS LCG LRIP deliveries. Complete ATWCS LCG IOC software development and conduct ATWCS LCG LBSIT and SBSIT. Achieve ATWCS TCG IOC and Milestone III. Conduct ATWCS LCG TECHEVAL.
- (U) (\$4,129) Continue development of Sub-ATWCS for CCS MK2 Program Block 1C. Deliver engagement planning Interface Definition Language (IDL) prototype and engineering build software of Sub ATWCS for Block 1C (software).
- (U) (\$81,328) Continue ATWCS for TBIP software development and integration. Continue TBIP EMD. Initiate Development Test (DT) Flight Testing and weapons control systems upgrades. Continue all C2 development through CDR and begin coding software for the restructured Phase 1 program. Begin DT and OA. Conduct missile LRIP Program review.

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

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204229N

PROJECT NUMBER: A0545

PROGRAM ELEMENT TITLE: TOMAHAWK AND

PROJECT TITLE: TOMAHAWK

THEATER MISSION PLANNING CENTER

3. (U) FY 1999 PLAN:

- (U) (\$566) Conduct ATWCS LCG OPEVAL and continue ATWCS LCG LRIP deliveries and begin production deliveries.
- (U) (\$4,534) Conduct DT of Sub ATWCS with CCS MK2 Program Block 1C. Conduct system and weapon compatibility testing for Sub ATWCS. Deliver initial installation suites for SSN 688 CCS MK2 Program Block 1C Mod 0/1 and Mod 2.
- (U) (\$59,059) Conduct DT for ATWCS for TBIP. Achieve ATWCS for TBIP Full Operational Capability (FOC) software delivery. Continue TBIP EMD, mission planning and weapons control systems upgrades. Continue DT.

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

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204229N

PROJECT NUMBER: A0545

PROGRAM ELEMENT TITLE: TOMAHAWK AND

PROJECT TITLE: TOMAHAWK

THEATER MISSION PLANNING CENTER

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	134,705	90,276	64,625
(U) Appropriated Value:	140,465		
(U) Adjustments from PRESBUDG:	-1,449	-4,508	-466
(U) FY 1999 President's Budget Submit:	133,256	85,768	64,159

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY97 net decrease of -\$1,449 thousand consists of decreases of -\$2,660 thousand for Small Business Innovative Research reductions; -\$176 thousand for revised economic reduction. These decreases are partially offset by an increase of +\$1,387 thousand for a Navy reprogramming. FY98 decrease of -\$4,508 thousand consists of -\$2,649 thousand for Congressional undistributed reductions and -\$1,859 thousand for a GAO recommended reduction. FY99 net decrease of -\$466 thousand consists of a decrease of -\$1,131 thousand for commercial purchases inflation; this decrease is partially offset by an increase of \$665 thousand for Navy R&D activity and Navy Working Capital Fund Activity rate adjustments.

(U) Schedule: FY97 - ATWCS LCG LRIP moved from 2Q to 3Q due to delays in the competition and award process. OPEVAL ATWCS TCG slipped from 1Q/97 to 4Q/97 due to postponing OPEVAL because of software maturity problems. 2Q/97 LBSIT ATWCS TCG added since decision was to redo ATWCS development from the contractor formal qualification test (FQT) event thru LBSIT, SBSIT and TECH/OPEVAL. 3Q/97 SBSIT/TECHEVAL ATWCS TCG slipped from 4Q/96 due to software maturity problems. 3Q/97 LBSIT ATWCS LCG slipped to 3Q/98 due to shift in overall LCG schedule driven by TCG delays. 3Q/97 SBSIT ATWCS LCG moved to 4Q/98 due to LCG schedule adjustments from TCG delays. FY98 - MSIII ATWCS TCG IOC slipped from 2Q/97 to 3Q/98 due to postponing OPEVAL because of software maturity problems. ATWCS LCG OPEVAL/IOC moved from 4Q/98 to 1Q/99 due to delays in ATWCS TCG OPEVAL and LCG hardware contract award. 3Q/98 OPEVAL ATWCS LCG moved to 1Q/99 due to LCG schedule adjustments from TCG delays. FY99 - 3Q TECHEVAL SUB ATWCS BLK 1C removed (already on schedule in 1Q/00). To Complete - 3Q/01 SUB ATWCS IOC changed to 4Q/01 to coincide with TBIP FOC. 1Q/00 OPEVAL SUB ATWCS BLK 1C is moved to 3Q/00-4Q/00 to coincide with TBIP missile availability and TBIP FOT&E period.

(U) Technical: Not applicable.

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Exhibit R-2, RDT&E Budget Item Justification  
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FY 1999 RDT&E,N PRESIDENT'S BUDGET ITEM JUSTIFICATION SHEET DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204229N

PROJECT NUMBER: A0545

PROGRAM ELEMENT TITLE: TOMAHAWK AND

PROJECT TITLE: TOMAHAWK

THEATER MISSION PLANNING CENTER

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

	<u>FY 1997</u> <u>ACTUAL</u>	<u>FY 1998</u> <u>ESTIMATE</u>	<u>FY 1999</u> <u>ESTIMATE</u>	<u>FY 2000</u> <u>ESTIMATE</u>	<u>FY 2001</u> <u>ESTIMATE</u>	<u>FY 2002</u> <u>ESTIMATE</u>	<u>FY 2003</u> <u>ESTIMATE</u>	<u>TO</u> <u>COMPLETE</u>	<u>TOTAL</u> <u>PROGRAM</u>
(U) WPN	102,192	49,976	129,758	127,373	120,495	106,065	164,453	CONT.	CONT.
(U) OPN	83,687	58,620	90,209	84,969	72,514	53,375	54,350	CONT.	CONT.
(U) OPN	0	1,392	3,961	6,410	5,856	8,764	7,417	CONT.	CONT.

(U) RELATED RDT&E: Not applicable.

D. (U) SCHEDULE PROFILE:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>TO COMPLETE</u>
Program Milestones	3Q ATWCS LCG LRIP	3Q MSIII ATWCS TCG IOC 4Q TBIP LRIP/ FRP DECISION	1Q ATWCS LCG IOC	4Q/00 IOC TBIP 4Q/01 SUB ATWCS IOC
Engineering Milestones T&E	4Q TBIP CDR			
Milestones	2Q LBSIT ATWCS TCG 1Q-2Q TECH/OP EVAL SUB ATWCS 3Q SBSIT/TECH EVAL ATWCS TCG 4Q OPEVAL ATWCS TCG	3Q/98-2Q/99 DT/OA TBIP 4Q SBSIT/TECH EVAL ATWCS LCG 3Q LBSIT ATWCS LCG	2-4Q/99 DT TBIP 1Q OPEVAL ATWCS LCG	1Q/00 TECHEVAL SUB ATWCS BLK 1C 1Q-2Q/00 OT TBIP 3-4Q/00 OPEVAL SUB ATWCS BLK 1C
Contract Milestones	TBIP ATWCS SUB ATWCS	TBIP ATWCS SUB ATWCS	TBIP ATWCS SUB ATWCS	TBIP ATWCS SUB ATWCS

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Exhibit R-2, RDT&E Budget Item Justification  
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FY 1999 RDT&E,N PRESIDENT'S BUDGET PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204229N

PROJECT NUMBER: A0545

PROGRAM ELEMENT TITLE: TOMAHAWK AND  
THEATER MISSION PLANNING CENTER

PROJECT TITLE: TOMAHAWK

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

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Software Development	58,020	31,642	22,196
b. Hardware/Software Development	72,836	46,126	28,963
c. Test & Evaluation	2,300	7,900	12,900
d. Travel	100	100	100
Total	133,256	85,768	64,159

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Exhibit R-3, RDT&E Program Element/Project Cost Breakdown  
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FY 1999 RDT&E,N PRESIDENT'S BUDGET PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204229N

PROJECT NUMBER: A0545

PROGRAM ELEMENT TITLE: TOMAHAWK AND

PROJECT TITLE: TOMAHAWK

THEATER MISSION PLANNING CENTER

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

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development										
NSWC, Dahlgren, VA	WX	Nov 98	90,890	90,890	36,326	11,800	8,021	9,184	CONT.	CONT.
Tiburon, San Jose, CA	SS/CPFF	Mar 94	35,248	35,248	14,210	14,200	4,360	2,002	CONT.	CONT.
APL, Laurel, MD	SS/CPFF	Apr 98	45,738	45,738	14,486	4,982	2,700	2,500	CONT.	CONT.
Hughes, Tuscon,AZ	C/CP	Jun 96	273,489	273,489	145,864	56,620	43,631	23,666	CONT.	CONT.
NAWC, China Lk, CA	WX	Dec 98	47,250	47,250	24,918	3,480	3,250	3,000	CONT.	CONT.
NSWC, Pt. Hueneme, CA	WX	Dec 96	8,988	8,988	8,260	728	0	0	0	8,988
MDA, St. Louis, MO	C/FP	Apr 94	32,605	32,605	20,175	3,303	919	800	CONT.	CONT.
NUWC, Newport,RI	WX	Dec 98	42,258	42,258	21,257	5,021	4,500	4,450	CONT.	CONT.
Lockheed, Austin,TX	SS/CPFF	Apr 94	41,100	41,100	27,246	8,854	5,000	0	0	41,100
SAIC, Arlington,VA	SS/CP	Mar 94	21,872	21,872	8,349	7,873	1,250	1,900	CONT.	CONT.
NAVSEA, Washington,DC	PD	Apr 98	16,638	16,638	6,358	6,425	3,000	1,000	CONT.	CONT.
GDE, San Diego,CA	SS/CP	Apr 94	15,618	15,618	6,127	2,000	1,000	823	CONT.	CONT.
Miscellaneous (<\$1M EACH)		Various	TBD	TBD	1,609,253	5,670	237	1,934	CONT.	CONT.

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Exhibit R-3, RDT&E Program Element/Project Cost Breakdown  
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FY 1999 RDT&E,N PRESIDENT'S BUDGET PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204229N

PROJECT NUMBER: A0545

PROGRAM ELEMENT TITLE: TOMAHAWK AND

PROJECT TITLE: TOMAHAWK

THEATER MISSION PLANNING CENTER

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

PERFORMING ORGANIZATIONS

<u>Contractor/ Government Performing Activity</u>	<u>Contract Method/ Fund Type Vehicle</u>	<u>Award/ Oblig Date</u>	<u>Perform Activity EAC</u>	<u>Project Office EAC</u>	<u>Total FY 1996 &amp; Prior</u>	<u>FY 1997 Budget</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Support and Management Miscellaneous					845	0	0	0	0	845
Test and Evaluation NAWC, Pt Mugu, CA	WX	Dec 98	TBD	TBD	1,504	1,834	6,525	9,025	CONT.	CONT.
Miscellaneous		Nov 98	TBD	TBD	476	466	1,375	3,875	CONT.	CONT.

GOVERNMENT FURNISHED PROPERTY Not Applicable

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Exhibit R-3, RDT&E Program Element/Project Cost Breakdown  
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FY 1999 RDT&E,N PRESIDENT'S BUDGET PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204229N

PROJECT NUMBER: A0545

PROGRAM ELEMENT TITLE: TOMAHAWK AND

PROJECT TITLE: TOMAHAWK

THEATER MISSION PLANNING CENTER

	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Subtotal Production Development	1,942,829	130,956	77,868	51,259	CONT.	CONT.
Subtotal Support and Management	845	0	0	0	0	845
Subtotal Test and Evaluation	1,980	2,300	7,900	12,900	CONT.	CONT.
Total Project	1,945,654	133,256	85,768	64,159	CONT.	CONT.

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

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204229N

PROGRAM ELEMENT TITLE: THEATER MISSION PLANNING CENTER

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
A1784 THEATER MISSION PLANNING CENTER	5,553	2,992	2,568	1,934	1,922	22	28	0	96,914

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The TOMAHAWK Theater Mission Planning Center (TMPC) ashore and Afloat Planning System (APS) provide data base generation and processing, flight mission data, command and control information preparation, and distribution for nuclear (TMPC only) and conventional TOMAHAWK Land Attack Missiles. The TMPC project designs and develops software to decrease mission planning time in response to contingency requirements, improves the production of missile data for distribution and provides automated command and control information for employment and strike planning. APS utilizes the TMPC software on down-sized and ruggedized computer hardware for use in support of Afloat Strike Warfare Commanders. This improves battle-group tactical flexibility and responsiveness while maximizing TOMAHAWK Weapon Systems (TWS) warfare capability. The TMPC and APS systems will be compatible with the Navy Command and Control Systems and the TOMAHAWK Weapon System. TOMAHAWK Strike Planning Tools are comprised of two elements. The Mission Distribution System (MDS) allows TOMAHAWK users the capability to transmit and receive mission data updates in a tactical environment. The Electronic TOMAHAWK Employment Planning Package (ETEPP) provides the TOMAHAWK user with command and control information needed to employ TOMAHAWK missions.

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FY 1999 RDT&E,N PRESIDENT'S BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204229N

PROJECT NUMBER: A1784

PROGRAM ELEMENT TITLE: THEATER MISSION PLANNING CENTER

PROJECT TITLE: TMPC

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$1,879) Concluded APS Strike Module Development/Operational Employment.
- (U) (\$1,955) Continued TMPC integration of New National Sensors and Software Architectural Enhancements.
- (U) (\$1,719) Supported development of enhancements to the MDS and ETEPP portion of the TOMAHAWK Strike Planning Tools.

2. (U) FY 1998 PLAN:

- (U) (\$1,769) Continue TMPC integration of New National Sensors and Software Architectural Enhancements.
- (U) (\$1,223) Support development of enhancements to the MDS and ETEEP portion of the TOMAHAWK Strike Planning Tools.

3. (U) FY 1999 PLAN:

- (U) (\$1,528) Continue TMPC integration of New National Sensors and Software Architectural Enhancements.
- (U) (\$1,040) Support development of enhancements to the MDS and ETEEP portion of the Tomahawk Strike Planning Tools.

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

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204229N

PROJECT NUMBER: A1784

PROGRAM ELEMENT: TITLE: THEATER MISSION PLANNING CENTER

PROJECT TITLE: TMPC

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	5,660	3,083	2,628
(U) Appropriated Value	5,899		
(U) Adjustments from PRESBUDG:	-107	-91	-60
(U) FY 1999 President's Budget Submit:	5,553	2,992	2,568

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY97 decrease of -\$107 thousand consists of -\$99 thousand for Small Business Innovative Research (SBIR) and -\$8 thousand for revised economic adjustments. The FY98 decrease of -\$91 thousand reflects Congressional undistributed reductions. The FY99 decrease of -\$60 thousand consists of -\$19 thousand for National Working Capital Fund surcharges, and -\$41 thousand for economic adjustments.

(U) Schedule: Not applicable

(U) Technical: Not applicable

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

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204229N

PROJECT NUMBER: A1784

PROGRAM ELEMENT TITLE: THEATER MISSION PLANNING CENTER

PROJECT TITLE: TMPC

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

Appropriation/Line Number	<u>FY 1997 ACTUAL</u>	<u>FY 1998 ESTIMATE</u>	<u>FY 1999 ESTIMATE</u>	<u>FY 2000 ESTIMATE</u>	<u>FY 2001 ESTIMATE</u>	<u>FY 2002 ESTIMATE</u>	<u>FY 2003 ESTIMATE</u>	<u>TO COMPLETE</u>	<u>TOTAL PROGRAM</u>
WPN	2,745	2,800	3,501	3,433	6,069	6,325	7,798	CONT.	CONT.
OPN	16,528	27,461	50,436	36,464	27,063	28,018	28,680	CONT.	CONT.

D. (U) SCHEDULE PROFILE:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>TO COMPLETE</u>
Program Milestones	3Q-4Q RTF TMPC 3.0	3Q-4Q RTF TMPC 3.1	3Q-4Q RTF TMPC 4.0	Annual Fleet Releases
Engineering Milestones				
T&E Milestones				
Contract Milestones	TMPC APS	TMPC APS	TMPC APS	

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Exhibit R-2, RDT&E Budget Item Justification  
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FY 1999 RDT&E,N PRESIDENT'S BUDGET PROGRAM ELEMENT/PROJECT COST BREAKDOWN    DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204229N

PROJECT NUMBER: A1784

PROGRAM ELEMENT TITLE: THEATER MISSION PLANNING CENTER

PROJECT TITLE: TMPC

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

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Software Development	5,553	2,992	2,568
Total	5,553	2,992	2,568

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FY 1999 RDT&E,N PRESIDENT'S BUDGET PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204229N

PROJECT NUMBER: A1784

PROGRAM ELEMENT TITLE: THEATER MISSION PLANNING CENTER

PROJECT TITLE: TMPC

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

PERFORMING ORGANIZATIONS

<u>Contractor/ Government Performing Activity</u>	<u>Contract Method/ Fund Type Vehicle</u>	<u>Award/ Oblig Date</u>	<u>Perform Activity EAC</u>	<u>Project Office EAC</u>	<u>Total FY 1996 &amp; Prior</u>	<u>FY 1997 Budget</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Product Development										
MDA St. Louis Mo	C\FFPI	June 94	36,841	36,841	36,841	0	0	0	0	36,841
GD\E San Diego Ca	SS\CPFF	June 94	15,136	15,136	9,746	1,596	1,137	982	1,675	15,136
NCCOSC San Diego Ca					2,251	2,074	1,041	896	0	6,262
MISCELLANEOUS		Various			33,057	1,883	814	690	2,231	38,675

Support and Management Not Applicable

Test and Evaluation Not Applicable

GOVERNMENT FURNISHED PROPERTY Not Applicable

R-1 Item No. 156

Exhibit R-3, RDT&E Program Element/Project Cost Breakdown  
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FY 1999 RDT&E,N PRESIDENT'S BUDGET PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204229N  
PROGRAM ELEMENT TITLE: THEATER MISSION PLANNING CENTER

PROJECT NUMBER: A1784  
PROJECT TITLE: TMPC

	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Subtotal Production Development	81,895	5,553	2,992	2,568	3,906	96,914
Subtotal Support and Management						
Subtotal Test and Evaluation						
Total Project	81,895	5,553	2,992	2,568	3,906	96,914

R-1 Item No. 156

Exhibit R-3, RDT&E Program Element/Project Cost Breakdown  
(Exhibit R-3, Page 18 of 18)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: Feb 1998

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0204311N      PROJECT NUMBER: X0766  
PROGRAM ELEMENT TITLE: Integrated Surveillance System      PROJECT TITLE: IUSS Detect/Classif System

(U) COST: (Dollars in Thousands)

PROJECT

NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
X0766 IUSS Detect/Classif System	16,879	8,308	15,833	17,451	17,276	15,987	17,038	CONT.	CONT.
X0758 SURTASS	16,247	1,265	3,939	4,915	6,503	6,632	7,749	CONT.	CONT.
TOTAL	33,126	9,573	19,772	22,366	23,779	22,619	24,787	CONT.	CONT.

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This Program Element (P.E.) comprises two projects - X0766 and X0758. Project X0766 provides for Integrated Undersea Surveillance Systems (IUSS) Research and Development Projects. Project X0758 is for the Surveillance Towed Array Sensor (SURTASS) development efforts. IUSS provides the Navy with its primary means of submarine detection both nuclear and diesel. The program has undergone a major transition from emphasis on maintaining a large dispersed surveillance force keyed to detection and tracking of soviet submarines to a much smaller force that is effective against modern diesel and nuclear submarines in regional/littoral or broad ocean areas of interest. This transition preserves the ability to continue open ocean surveillance.

(U) The IUSS Research and Development project (X0766) funds Fixed Surveillance Systems (FSS) which encompasses the Sound Surveillance System (SOSUS), the Surveillance Direction System (SDS), and SURTASS Low Frequency Active (LFA) developments. The number of FSS processing sites has been reduced and the display equipment used at the remaining sites will be converted to SDS/SSIPS (Shore Signal and Information Processing Segment) to significantly lower life cycle costs and enable system-wide consolidation. The SDS Command, Control and Communications system provides the means for Fixed Distributed System (FDS), SOSUS, and SURTASS to manage and report contacts with minimum time-late. The SDS equipment and software replace obsolescent components of IUSS which are increasingly expensive to support. SURTASS LFA will provide an active adjunct capability for IUSS passive and tactical sensors to assist in countering the quieter diesel and nuclear threats of the 1990s and beyond. The LFA tasks are directed at detection of slow quiet threats in harsh littoral waters.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: Budget Activity 7: This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT

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

DATE: Feb 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204311N

PROJECT NUMBER: X0766

PROGRAM ELEMENT TITLE: Integrated Surveillance System

PROJECT TITLE: IUSS Detect/Classif System

because it encompasses engineering and manufacturing development for upgrade of existing operational systems.

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

DATE: Feb 1998

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0204311N      PROJECT NUMBER: X0766  
PROGRAM ELEMENT TITLE: Integrated Surveillance System      PROJECT TITLE: IUSS Detect/Classif System

(U) COST (Dollars in thousands)

PROJECT

NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
X0766 IUSS Detect/Classif System									
TOTAL	16,879	8,308	15,833	17,451	17,276	15,987	17,038	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: SDS will provide the Command, Control, Communications (C3) and data fusion functions to combine the capabilities of the FDS, SURTASS, and SOSUS, sensor systems in a manner that provides a comprehensive maritime surveillance picture. SDS will provide a reliable and mobile tactical communications system significantly reducing reporting times. SDS will be fully integrated into the Navy's Space and Electronic Warfare Architecture and is using conventional fleet circuits for direct reporting to the fleet. Joint Maritime Command Information System (JMCIS) will serve as the IUSS gateway to the fleet and is being upgraded to better report acoustic data. In addition, SDS is a specified requirement for FDS and Advanced Deployable System (ADS) sensor fusion and communications developments. LFA will provide an active adjunct capability for IUSS passive and tactical sensors to counter the quieter diesel and nuclear threats of the 1990s and beyond. The LFA tasks are directed at detection of slow quiet threats in harsh littoral waters. Functional improvements are delivered to the Fleet in software "Builds". SURTASS/LFA Build #1 (FY 97) includes waveform processing improvements, tactical processing interfaces, and signal processing enhancements. Build #2 (FY 98) includes Twin-Line/LFA integration; advanced waveforms for littoral/shallow water operations including doppler sensitive waveforms; and processing algorithms to reduce clutter and reverberation false alarms in shallow water. Build #3 (FY 99) includes Adaptive Beamforming; Integration of tactical decision aids for LFA monostatic and bistatic operation; integration of SURTASS active and passive information processing systems to provide contact association and geographic tracking; and common antisubmarine warfare (ASW) OMI and environmental processing. The LFA task includes development and test of a compact LFA transmit source array for SWATH-P ships.

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

DATE: Feb 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204311N

PROJECT NUMBER: X0766

PROGRAM ELEMENT TITLE: Integrated Surveillance System

PROJECT TITLE: IUSS Detect/Classif System

## (U) PROGRAM ACCOMPLISHMENTS AND PLANS:

### 1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$ 2,000) Conducted analysis, trade-off studies and prototyping for Compact LFA.
- (U) (\$ 1,400) Continued LFA development of data fusion algorithms and C4I interfaces for tactical reporting.
- (U) (\$ 1,550) Performed data analysis on FY 1996 sea test data and conducted two FY 1997 sea tests.
- (U) (\$ 2,704) Continued development of algorithms and signal/data processing software for littoral/shallow water performance.
- (U) (\$ 3,544) Completed and installed SDS Build 5 at 4400. Completed SDS TECHEVAL. Assessed FDS SSIPS real world performance and corrected software to optimize processing.
- (U) (\$ 2,041) Continued LFA development and integration of active and passive signal/data processing software for littoral water operations, including advanced waveforms and clutter and reverberation reduction algorithms.
- (U) (\$ 302) Updated IUSS to comply with revised Naval Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR) implemented guidance. Conducted associated IUSS C4ISR operating system, technical and information architecture studies and analysis.
- (U) (\$ 1,490) Conducted investigations and analysis to support preparation of Environmental Impact Statement (EIS) for LFA.
- (U) (\$ 1,848) Continued sea testing and tested data analysis.

### 2. (U) FY 1998 PLAN:

- (U) (\$ 1,008) SDS design development; complete coding, integrating and test of baseline system. Conduct

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

DATE: Feb 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204311N

PROJECT NUMBER: X0766

PROGRAM ELEMENT TITLE: Integrated Surveillance System

PROJECT TITLE: IUSS Detect/Classif System

OPEVAL and Milestone III decision meeting. Complete action on operational deficiencies as documented by OPTEVFOR. Maintain currency with communications systems evolution. Incorporate Advanced Technology Development (ATD), Advanced Concept Technology Demonstration (ACTD) and Small Business Innovative Research (SBIR) technology.

- (U) (\$ 588) SSIPS development; assess SSIPS real world performance and correct software to optimize processing. Incorporate Fleet required performance enhancements. Incorporate ATD, ACTD and SBIR technology.
- (U) (\$ 300) Investigate impact of Year 2000 data roll-over problem.
- (U) (\$ 4,756) Initiate development of Compact Low Frequency Active (CLFA) EDM transmit source array.
- (U) (\$ 1,500) Conduct investigations and analysis to support preparation of Environmental Impact Statement (EIS) for LFA.
- (U) (\$ 156) Update IUSS to comply with revised Naval Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR) implemented guidance. Conduct associated IUSS C4ISR operating system, technical and information architecture studies and analysis.

### 3. (U) FY 1999 PLAN:

- (U) (\$ 1,103) SDS for Advanced Deployable System (ADS); modify SDS for use with ADS. Procure hardware, modify existing software for deployment environment. Integrate SDS system with ADS prototype and support at sea testing.
- (U) (\$700) FSS/SDS/SSIPS design development; assess SDS/SSIPS real world performance and modify software to optimize processing. Maintain currency with communications systems evolution. Incorporate ATD, ACTD and SBIR technology. Improve signal processing and automation tools.
- (U) (\$300) Complete development, coding, testing, and field installation of the required software maintenance actions before the Year 2000 data change. Investigate impact of Year 2000 data roll-over problem.
- (U) (\$7,507) Continue development of CLFA EDM transmit source array.

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

DATE: Feb 1998

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0204311N      PROJECT NUMBER: X0766  
 PROGRAM ELEMENT TITLE: Integrated Surveillance System      PROJECT TITLE: IUSS Detect/Classif System

- (U) (\$4,458) Continue LFA development and integration of signal/data processing software for littoral/shallow water operation to support RV CORY CHOUEST operations and T-AGOS 23 Fleet introduction.
- (U) (\$1,765) Continue sea testing and test data analysis.

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1997	FY 1998	FY 1999
(U) FY 1998 President's Budget:	17,803	8,564	18,327
Adjustments from FY 1998 PRESBUDG:	-924	-256	-2,494
(U) FY 1999 President's Budget Submit:	16,879	8,308	15,833

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY97 was decreased by \$924K; -\$449K for Small Business Innovative Research assessment; -\$475K Navy minor program adjustments. FY98 was decreased by \$256K for Congressional undistributed general adjustments. FY99 was reduced by \$2,494K; -\$2277K to reflect redirection to develop and update C4ISR mission requirements; +\$62K for congressional undistributed and -\$279K comm purchases, inflation and general adjustments.

(U) Schedule/Technical: FY99: Delays SDS/SSIPS system integration of JMCIS, C4ISR and threat orientated processing enhancements, reducing ability to meet mission needs. Delay integration of twin-line into LFA by 6 months.

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

	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	TO	TOTAL
	ACTUAL	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	COMPLETE	PROGRAM
OPN# 2225	31,605	13,837	9,553	19,813	38,784	36,645	55,556	CONT.	CONT.
OMN 1C3C	65,848	66,473	69,394	70,221	68,108	71,027	88,328	CONT.	CONT.
OPN# 2237	9,065	4,146	11,918	15,162	4,724	21,769	22,676	CONT.	CONT.
SCN	0.0	34	1,360	3,788	0.0	0.0	0.0	CONT.	CONT.

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

DATE: Feb 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204311N

PROJECT NUMBER: X0766

PROGRAM ELEMENT TITLE: Integrated Surveillance System

PROJECT TITLE: IUSS Detect/Classif System

(U) RELATED RDT&E:

(U) PE 0204311N(Integrated Surveillance System)

(U) PE 0603785N(Combat Systems Oceanographic Performance Assessment)

(U) PE 0603747N(Undersea Warfare Advanced Technology)

D. (U) SCHEDULE PROFILE:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
Program			
Milestones	SDS MS II/III 3Q/97		
Engineering	BUILD #1 LITTORAL	Build #2 LITTORAL	
Milestones	IMPROV 10/96	IMPROV 9/98	
T&E	SEA TESTS 8/97	SDS OPEVAL 2Q/98	T-AGOS 23
Milestones	SDS TECHEVAL 2Q/97		DLVRY 12/98 SEA TESTS/OA 2/99

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

DATE: Feb 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204311N

PROJECT NUMBER: X0766

PROGRAM ELEMENT TITLE: Integrated Surveillance System

PROJECT TITLE: IUSS Detect/Classif System

Contract  
Milestones

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

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Software Development/Testing	2,602	1,580	1,606
b. Program Management	828	250	423
c. Special Projects	95	107	110
d. System Integration/ Receive Subsystem	6,106	0	3,357
e. Sea Tests/Data Analysis	2,362	0	1,725
f. LFA Littoral Improvements	4,886	6,371	8,612
Current Controls	16,879	8,308	15,833

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

DATE: Feb 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204311N

PROJECT NUMBER: X0766

PROGRAM ELEMENT TITLE: Integrated Surveillance System

PROJECT TITLE: IUSS Detect/Classif System

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

PERFORMING ORGANIZATIONS

<u>Contractor/ Government Performing Activity</u>	<u>Contract Method/ Fund Type Vehicle Program</u>	<u>Award Oblig Date</u>	<u>Perform Activity EAC</u>	<u>Project Office EAC</u>	<u>Total FY 1995 &amp; Prior</u>	<u>FY 1996 Budget</u>	<u>FY 1997 Budget</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total</u>
Product Development LOCKHEED MARTIN Manassas, VA	C/CPFF	9/91 option	41,649	41,649	11,886	1,230	3,731	1,746	1,964	CONT.	CONT.
VARIOUS	Various		72,005	72,005	50,950	5,341	2,271	2,207	3,684	CONT.	CONT.
Raytheon (Formerly HAC) Fullerton, CA	SS/CPFF	8/90 option	63,228	63,228	43,974	11,429	9,135	2,192	2,151	CONT.	CONT.
LOCKHEED MARTIN Nashua, NH	SS/CPFF	10/97 option						1,505	7,009	CONT.	CONT.

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

DATE: Feb 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204311N

PROJECT NUMBER: X0766

PROGRAM ELEMENT TITLE: Integrated Surveillance System

PROJECT TITLE: IUSS Detect/Classif System

Government Performing Activity	Method/ Fund Type Vehicle	Award Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1995 & Prior	FY 1996 Budget	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Support and Management											
MISC-TRW	C/CPAF	11/95 option	5,495	5,495	3,500	250	340	119	325	CONT.	CONT.
Various	WX					389	411	239	200	CONT.	CONT.
Test and Evaluation											
Various	WX					880	991	300	475	CONT.	CONT.
GOVERNMENT FURNISHED PROPERTY		Not applicable.									
Subtotal Product Development						18,000	15,137	7,650	14808	CONT.	CONT.
Subtotal Support and Management						639	751	358	550	CONT.	CONT.
Subtotal Test and Evaluation						880	991	300	475	CONT.	CONT.
Total Project						19,519	16,879	8,308	15,833	CONT.	CONT.

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

DATE: Feb 1998

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0204311N      PROJECT NUMBER: X0758  
PROGRAM ELEMENT TITLE: Integrated Surveillance System      PROJECT TITLE: SURTASS

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
X0758 SURTASS	16,247	1,265	3,939	4,915	6,503	6,632	7,749	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The SURTASS project comprises the mobile, tactical arm of the Integrated Undersea Surveillance System, providing long range detection and cueing for tactical weapons platforms against both diesel and nuclear powered submarines. With the SOSUS Arrays being placed in a standby status (data available but not continuously monitored), SURTASS must provide the undersea surveillance necessary to support regional conflicts and sea lane protection. SURTASS has experienced recent passive and active success against diesel submarines operating in shallow water. SURTASS is greatly reducing costs by consolidating logistics support, using Non-Developmental Items and commercial hardware, and increasing operator efficiency through computer aided detection and classification processing. SURTASS development efforts include: twin-line array processing, improved detection and classification/passive automation to counter quieter threats; additional signal processing and bi-static active capability; integrated active and passive operations; improved Battle Group support; and improved information processing. Functional improvements are delivered to the Fleet in software "Builds". Build #1 (FY 95) included source-set formulation and analysis tools, automated line trackers and nuclear source auto-detector. Build #2 (FY 96) included wideband energy trackers, wideband/narrowband feature association, and diesel Full Spectrum Processing (FSP). Build #3 (FY 97) includes twin-line integration, automated localization and tracking, diesel automated detectors. Build #4 (FY 98) includes automated classification aids that provide surface/subsurface target discrimination and subsurface target classification clues; bistatic LFA signal processing and integration of active and passive information processing subsystems to improve contact association and geographic tracking performance.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$12,663) Continued array improvements, including multi-line development, Fiber Optics, twinline integration and expanded array/processing interoperability.
- (U) (\$ 2,492) Continued software development for computer aided detection and classification/passive automation.

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

DATE: Feb 1998

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0204311N      PROJECT NUMBER: X0758  
PROGRAM ELEMENT TITLE: Integrated Surveillance System      PROJECT TITLE: SURTASS

- (U) (\$ 998) Continued signal processing improvements including Bi-Static processing.
- (U) (\$ 94) Updated SURTASS to comply with revised Naval Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR) implemented guidance. Conducted associated SURTASS C4ISR operating system, technical and information architecture studies and analysis.

2. (U) FY 1998 PLAN:

- (U) (\$ 1,241) Continue signal processing improvements including Bi-Static processing.
- (U) (\$ 24) Update SURTASS to comply with revised Naval Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR) implemented guidance. Conduct associated SURTASS C4ISR operating system, technical and information architecture studies and analysis.

3. (U) FY 1999 PLAN:

- (U) (\$2,399) Continue software development for computer aided detection and classification including improvements to nuclear and diesel auto-detectors, integration of active and passive information processing, and improved classification aids.
- (U) (\$1,540) Continue array improvements and integration and expanded array interoperability.

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	16,805	1,318	6,050
Adjustments from FY98 PRESBUDG:	-558	-53	2,111
(U) FY 1999 President's Budget Submit:	16,247	1,265	3,939

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY97 was decreased by \$558K; -\$438K for Small Business Innovative Research assessment and -\$120K for Navy minor program adjustments. FY98 decreased by \$53K for Congressional undistributed general

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Budget Item Justification  
(Exhibit R-2, Page 12 of 17)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: Feb 1998

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0204311N      PROJECT NUMBER: X0758  
PROGRAM ELEMENT TITLE: Integrated Surveillance System      PROJECT TITLE: SURTASS  
adjustments. FY99 was decreased by \$2,111K; -\$2,000K to reduce SURTASS array improvements, -\$137K Navy minor program adjustments, and +\$26K NWCF rate adjustments.

(U) Schedule/Technical: FY99 reduction delays arrays development for increased frequency coverage and tactical interoperability.

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

D.

	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	TO	TOTAL
	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	COMPLETE	PROGRAM
SCN	0	3,000	84,086	0	0	0	0	CONT.	CONT.
OPN #2237	9,065	4,146	11,918	15,162	4,724	21,769	22,676	CONT.	CONT.

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

DATE: Feb 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204311N

PROJECT NUMBER: X0758

PROGRAM ELEMENT TITLE: Integrated Surveillance System

PROJECT TITLE: SURTASS

(U) RELATED RDT&E:

(U) PE 0204311N(Integrated Surveillance System)

(U) PE 0603785N(Combat Systems Oceanographic Performance Assessment)

(U) PE 0603747N(Undersea Warfare Advanced Technology)

D. (U) SCHEDULE PROFILE:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
Program Milestones			
	BUILD #3	BUILD #4	
Engineering Milestones	COMPUTER AIDED DET/CLASS	COMPUTER AIDED DET/CLASS	
T&E Milestones	DT TWIN-LINE	DT/OT TWIN-LINE	
Contract Milestones			

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

DATE: Feb 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204311N

PROJECT NUMBER: X0758

PROGRAM ELEMENT TITLE: Integrated Surveillance System

PROJECT TITLE: SURTASS

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

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Passive Processing/Automation	2,492	0	2,399
b. Array Improvements	12,663	0	1,540
c. Signal Processing Improvements	1,092	1,265	0
Current Allocation	16,247	1,265	3,939

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: Feb 1998

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0204311N      PROJECT NUMBER: X0758  
 PROGRAM ELEMENT TITLE: Integrated Surveillance System      PROJECT TITLE: SURTASS

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

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1995 & Prior	FY 1996 Budget	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development											
Raytheon * Fullerton, CA	SS/CPFF	5/89 option	32,500	32,500	25,407	4,440	0	0	0	CONT.	CONT.
Raytheon * Fullerton, CA	SS/CPFF	8/90 option	41,233	41,233	22,653	1,529	10,278	1,100	1,113	CONT.	CONT.
APL/JHU Baltimore, MD		10/95				2,945	1,000	0	1,095	CONT.	CONT.
NRAD San Diego, CA	WX					0	3,000	0	781	CONT.	CONT.
Support and Management											
VARIOUS	WR					900	1,069	165	150	CONT.	CONT.
Test and Evaluation											
VARIOUS	WR					1,226	900	0	800	CONT.	CONT.

(\* ) Formerly HAC

GOVERNMENT FURNISHED PROPERTY      Not applicable.

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

DATE: Feb 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204311N

PROJECT NUMBER: X0758

PROGRAM ELEMENT TITLE: Integrated Surveillance System

PROJECT TITLE: SURTASS

	<u>FY 1997</u> <u>Budget</u>	<u>FY 1998</u> <u>Budget</u>	<u>FY 1999</u> <u>Budget</u>	<u>To</u> <u>Complete</u>	<u>Total</u> <u>Program</u>
Subtotal Product Development	14,278	1,100	2989	CONT.	CONT.
Subtotal Support and Management	1,069	165	150	CONT.	CONT.
Subtotal Test and Evaluation	900		800	CONT.	CONT.
Total Project	16,247	1,265	3,939	CONT.	CONT.

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

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204413N

PROGRAM ELEMENT TITLE: Amphibious Tactical Support Units

(U) COST (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
S1980	Amphib Other C2 546	0	0	0	0	0	0	0	15,752
22231	MCAC Weapons Development 685	645	1,945	3,449	1,976	1,967	1,959	CONT.	CONT.
TOTAL	1,231	645	1,945	3,449	1,976	1,967	1,959	CONT.	CONT.

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: Both projects support Landing Craft, Air Cushion (LCAC) during amphibious operations. Project S1980, AN/KSQ-1 Amphibious Assault Direction System integrates existing developments into a system which will support the command and control of surface amphibious assaults launched from extended, over-the-horizon, off shore ranges. The AN/KSQ-1 adapts the USMC's Position Location Reporting System for naval operations and integrates it with shipboard navigation and communication systems. The AN/KSQ-1 is required to identify, track, communicate with, and control landing craft from launch through transit, offload, and return. AN/KSQ-1 will be integrated with the Joint Maritime Command Information System (JMCIS). The feasibility of using alternate sources of position location information (PLI) instead of PLRS and integrating available sources of PLI into the AN/KSQ-1 system will be investigated. Project 22231, LCAC Control Enhancements initiates studies that will provide a remote control capability for LCAC and will be integrated and scheduled with developing minesweeping and shallow water mine-counter-measures systems. LCAC Deep Skirt provides an improved LCAC performance in Sea State 3 and higher and improved capability near and in the surf zone for explosive lane breaching missions in support of amphibious operations.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under OPERATIONAL SYSTEMS DEELOPMENT because it encompasses engineering and manufacturing development for upgrade of existing, operational systems.

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

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204413N

PROJECT NUMBER: 22231

PROGRAM ELEMENT TITLE: Amphibious Tactical  
Support Units

PROJECT TITLE: MCAC Weapons Development

(U) COST (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
22231 MCAC Weapons Development	685	645	1,945	3,449	1,976	1,967	1,959	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: Project S2231, LCAC Control Enhancements initiates studies that will provide a remote control capability for LCAC and will be integrated and scheduled with developing minesweeping and shallow water mine-counter-measures systems. LCAC Deep Skirt will provide an improved LCAC performance in Sea State 3 and higher and improved capability near and in the surf zone for explosive lane breaching missions in support of amphibious operations.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$620) Completed full scale fabrication and installation of Deep Skirt on test craft.
- (U) (\$65) Completed control system enhancement/SWMCM system integration.

2. (U) FY 1998 PLAN:

- (U) (\$645) Full scale testing of Deep Skirt.

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

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204413N

PROJECT NUMBER: 22231

PROGRAM ELEMENT TITLE: Amphibious Tactical  
Support Units

PROJECT TITLE: MCAC Weapons Development

3. (U) FY 1999 PLAN:

- (U) (\$1,945) Develop and approve operational concept for remote control

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY1997</u>	<u>FY1998</u>	<u>FY1999</u>
(U) FY 1998 President's Budget	897	672	3,210
(U) Appropriated Value:	946	672	
(U) Adjustments to FY 1997/98 Appropriated Value/ FY 1998 President's Budget:			
(a) Undistributed Reductions	-261	-27	-55
(b) Pricing Adjustments			-1,210
(U) FY 1999 PRESBUD Submit:	685	645	1,945

(U) CHANGE SUMMARY EXPLANATION:

- (U) Funding: The decrease in FY 1997 totaling (-\$261K) results from undistributed reductions and a NAVCOMPT execution mark against the program. The decrease in FY98 is a result of undistributed reductions. FY99 totaling is a combination of undistributed reductions and pricing adjustments.
- (U) Schedule: Not applicable.
- (U) Technical: Not applicable.

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

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204413N

PROJECT NUMBER: 22231

PROGRAM ELEMENT TITLE: Amphibious Tactical  
Support Units

PROJECT TITLE: MCAC Weapons Development

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

FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
(U) OPN Line 098000								
- 0 -	- 0 -	0	0	0	4,386	4,379	CONT.	CONT.

(U) RELATED RDT&E - Not applicable.

D. (U) SCHEDULE PROFILE:

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

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204413N  
 PROGRAM ELEMENT TITLE: Amphibious Tactical Support Units

PROJECT NUMBER: 22231  
 PROJECT TITLE: MCAC Weapons Development

ID	Task Name	95	1996				1997				1998				1999				2000				2001				2002				2003				2004			
		Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4			
1	<b>DEEP SKIRT R&amp;D PROJECT</b>																																					
2	CONCEPT TRADEOFF STUDIES																																					
9	DEEP SKIRT DESIGN DEVELOPMENT																																					
10	DEVELOP BASIC GEOMETRY																																					
12	DEEP SKIRT TOW TANK TESTS																																					
33	CONTRACT PROCUREMENT																																					
34	DEEP SKIRT MECH. MODIFICATIONS																																					
35	DESIGN OF MODS																																					
36	FINAL DESIGN REV. FAB GO AHEAD																																					
37	MODIFY LCAC 66 HULL																																					
38	DEEP SKIRT DRAWINGS DEV.																																					
39	DEVELOP TEMPLATES																																					
40	DEVELOP FAB DRAWINGS																																					
41	DEEP SKIRT FULL SCALE FABRICATION																																					
42	FABRICATE SKIRT PROTOTYPE																																					
43	FULL SCALE TESTING SUPPORT																																					
44	FULL-SCALE SKIRT INSTALLATION																																					
45	FULL SCALE PERFORMANCE TEST																																					
46	TEST PLAN REVIEW, TEST GO-AHEAD																																					
47	VERIFY INFLATED GEOMETRY																																					
48	DETERMINE STATIC STABILITY																																					
49	AT SEA PERFORMANCE TESTING																																					
50	WELL-DECK INTERFACE TEST PLAN																																					
51	WELL DECK INTERFACE																																					
52	FULL SCALE ENDURANCE TESTING																																					
53	SPRAY SUPPRESSOR EVALUATION																																					
54	SWMCM WITH DEEP SKIRT EVAL.																																					
55	PROCURE SKIRTS FOR FLEET CRAFT																																					
56	INSTALL SKIRTS ON FLEET CRAFT																																					

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Budget Item Justification  
 (Exhibit R-2 Page 5 of 8)

# UNCLASSIFIED

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

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204413N

PROJECT NUMBER: 22231

PROGRAM ELEMENT TITLE: Amphibious Tactical  
Support Units

PROJECT TITLE: MCAC Weapons Development

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

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Primary Hardware Development	98	0	1,865
b. Integrated Logistics Support	50	0	0
c. Program Management Support	134	60	60
d. Test and Evaluation	383	570	0
e. Travel	20	15	20
Total	685	645	1,945

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

R-1 Line Item 158

RDT&E PE/Project Cost Breakdown  
(Exhibit R-3 Page 6 of 8)

# UNCLASSIFIED

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

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204413N

PROJECT NUMBER: 22231

PROGRAM ELEMENT TITLE: Amphibious Tactical  
Support Units

PROJECT TITLE: MCAC Weapons Development

PERFORMING ORGANIZATIONS

<u>Contractor/ Government Performing Activity</u>	<u>Contract Method/ Fund Type Vehicle</u>	<u>Award/ Oblig Date</u>	<u>Perform Activity EAC</u>	<u>Project Office EAC</u>	<u>Total FY 1996 &amp; Prior</u>	<u>FY 1997 Budget</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Product Development VARIOUS	WR	12/97	CONT.	CONT.	3,319	148	0	1,865	CONT.	CONT.
Support and Management VARIOUS	CPAF	01/98	CONT.	CONT.	650	154	75	80	CONT.	CONT.
Test and Evaluation VARIOUS	WR	12/97	CONT.	CONT.	3,549	383	570	0	CONT.	CONT.

GOVERNMENT FURNISHED PROPERTY

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

R-1 Line Item 158

RDT&E PE/Project Cost Breakdown  
(Exhibit R-3 Page 7 of 8)

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

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204413N

PROJECT NUMBER: 22231

PROGRAM ELEMENT TITLE: Amphibious Tactical  
Support Units

PROJECT TITLE: MCAC Weapons Development

	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Subtotal Product Development	3,319	148	0	1,865	CONT.	CONT.
Subtotal Support and Management	650	154	75	80	CONT.	CONT.
Subtotal Test and Evaluation	3,549	383	570	0	CONT.	CONT.
Total Project	7,518	685	645	1,945	CONT.	CONT.

R-1 Line Item 158

RDT&E PE/Project Cost Breakdown  
(Exhibit R-3 Page 8 of 8)

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FY 1999 RDT&E BUDGET ITEM JUSTIFICATION SHEET

DATE: FEBRUARY 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N

PROGRAM ELEMENT TITLE: Consolidated Training Systems Development

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
21427 Surface Tactical Team Trainer (STTT)	5,090	10,624	5,964	1,165	1,677	2,388	3,463	CONT.	CONT.
21823 Training and Modeling Systems (TMS)	3,658	8,476	8,167	8,316	10,537	8,813	9,027	CONT.	CONT.
W0431 Tactical Aircrew Combat Training System (TACTS)	3,508	3,367	3,069	4,934	4,897	6,174	6,254	CONT.	CONT.
W0604 Training Range and Instrumentation Development (TRID)	8,121	8,985	2,195	1,734	1,058	2,065	1,678	CONT.	CONT.
W1998 Joint Tactical Combat Training System (JTCTS)	19,674	32,365	6,942	7,910	7,937	6,001	5,059	CONT.	CONT.
W2124 Air Warfare Training Development (AWTD)	1,716	1,972	2,053	2,167	2,219	1,979	2,216	CONT.	CONT.
X1823 Training and Training Devices Systems (TTDS)	1,425	872	0	0	0	0	0	0	14,162*
TOTAL	43,192	66,661	28,390	26,226	28,325	27,420	27,697	CONT.	CONT.

\* This amount includes FY 92-FY 98

FY98 W0604 includes a net congressional enhanced funding for project number W2450(\$4852)

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The STTT will develop the Battle Force Tactical Training (BFTT) System to provide realistic joint warfare training including a means to link ships together for coordinated Combat System team training using Distributed Interactive Simulation (DIS) protocols. The TMS encompasses the requirements analysis and software development associated with the Navy's Maritime Development Agent function as part of the Joint Simulation System (JSIMS). The BFTT will develop the BFTT Electronic Warfare Trainer (BEWT) and applicable BFTT system software to provide EW operator and team training for Fleet EW Systems. TACTS provides real-time monitoring and post-exercise debrief of aircrews flying on instrumented training ranges. This system is the primary training tool used by the Naval Strike and Air Warfare Center and the Marine Aviation Weapons and Tactics Squadron. TRID program provides development of many range systems including range electronic warfare simulator, advanced weapons training systems, laser

R-1 Line Item 159

Exhibit R-2, RDT&E Budget Item Justification  
(Exhibit R-2, Page 1 of 48)

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FY 1999 RDT&E BUDGET ITEM JUSTIFICATION SHEET

DATE: FEBRUARY 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N

PROGRAM ELEMENT TITLE: Consolidated Training Systems Development

(U) COST: (Dollars in Thousands)

training systems, and shallow water range technology. The Pacific Missile Range Facility (PMRF) Optical Sensors project is developing state of the art Electro-Optical Sensors that will provide the data collection systems the capability of performing surveillance acquisition, tracking, and identification of low observable objects at PMRF. JTCTS was initially planned to provide U.S. Navy fleet deployable instrumentation for at sea surface, subsurface, and air training and tactics development and fixed/transportable air range instrumentation for U.S. Navy and U.S. Air Force air training and tactics development. JTCTS incorporates the Defense Modeling and Simulation Office sponsored Distributed Interactive Simulation Protocol Data Unit for interoperability with Navy and other service live, virtual (simulators), and constructive (war games) simulations. Based on the cancellation of the JTCTS program after FY98, JTCTS was restructured and will result in the delivery of development hardware/software for a Carrier Air Wing 5 (CAG-5) capability after undergoing development testing. This summary reflects only the USN funding component of the JTCTS. AWTD program provides development of many aviation training systems including, mission rehearsal simulation technologies and the Aviation Training Technology Integration Facility (ATTIF). TTDS provides a geographically distributed wargaming system for littoral operations training which supports objectives of Fleet Commanders, Naval War College, Joint Warfare Center, and Tactical Training Groups in wargaming, tactical decision making training, and tactics development and evaluation.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it encompasses engineering and manufacturing development for upgrade of existing, operational systems.

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

DATE: FEBRUARY 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N

PROGRAM ELEMENT TITLE: Consolidated Training Systems Development

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
21427 Surface Tactical Team Trainer (STTT)	5,090	10,624	5,964	1,165	1,677	2,388	3,463	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Battle Force Tactical Training (BFTT) Program provides realistic joint warfare training across the spectrum of armed conflict; realistic unit level team training in all warfare areas; a means to link ships together which are in different homeports for coordinated training; external stimulation of shipboard training systems; and simulation of non-shipboard forces. BFTT uses a distributed architecture, integrating existing training systems, and uses Distributed Interactive Simulation (DIS) protocols. BFTT provides ships' Commanding Officers and Battle Group/Battle Force Commanders with the ability to conduct coordinated, realistic, high stress, combat system team training as an integral part of the Afloat Training Organization. BFTT Baseline 1 provides a baseline capability/system that meets the Operational Requirements Document (ORD). Upgrade of the Standard Ocean Acoustics Model (SOAM) provided a realistic, reusable software ocean model for use in Naval training systems. The AN/SSQ-94 Mine Warfare Model (MW MODEL) will provide integration of the Minefield Server/Mine Warfare Trainer capability with BFTT. Stimulators/Simulators (STIM/SIM) provides standardized Radio Frequency(RF), Intermediate Frequency (IF), and/or Digital injection into surface ship radars and fire control systems for training of shipboard operators/teams as part of the BFTT System. The Cryptologic Systems Trainer (CST)/BFTT Electronic Warfare Trainer (BEWT) development effort will provide embedded operator and team electronic emissions recognition training capability, integrated with BFTT.

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

DATE: FEBRUARY 1998

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0204571N      PROJECT NUMBER: 21427  
PROGRAM ELEMENT TITLE: Consolidated Training      PROJECT TITLE: Surface Tactical Team  
Systems Development      Trainer (STTT)

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1.(U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$1,449) BFTT B/L 1 - Began conduct of DT-III which includes recompiled BFTT software as follows: Scenario Generation & Control Human Machine Interface/Distributed Interactive Simulation (SG&C/HMI/DIS) upgrades, the final AEGIS Combat Training System (ACTS) configuration in DDG 51 Class, additional On-Board Trainer (OBT) interfaces, NAVSIM and PM enhancements (both ship and shore). Accomplished Milestone III. Attained BFTT Initial Operational Capability (IOC).
- (U) (\$155) Mine Warfare - Continued development of the software modifications required to integrate the Mine Warfare capability with BFTT.
- (U) (\$1,441) SIM/STIM - Award contract to develop generic Radio Frequency (RF) and Intermediate Frequency (IF) radar simulators. Initiate development of MK 91 NATO Sea Sparrow Missile System RF Stimulator.
- (U) (\$45) SOAM - Completed the update to the SOAM to incorporate Shallow Water effects.
- (U) (\$2,000) CST/EW - Resumed development of the Cryptologic Systems Trainer (CST)/Electronic Warfare (EW).

2. (U) FY 1998 PLAN:

- (U) (\$2,683) BFTT B/L 1 - Develop software required as a result of lessons learned/additional Fleet requirements since BFTT IOC to include the updated AEGIS Combat Training System (ACTS) interface and complete software development of the modifications required to incorporate amphibious/littoral functionality into BFTT software.
- (U) (\$500) Mine Warfare - Complete development of the software modifications required to integrate the Mine Warfare capability.
- (U) (\$1,589) STIM/SIM - Continue development of the MK 91 NATO Sea Sparrow Missile System RF Stimulator.
- (U) (\$1,000) CST/BEWT - Continue development of the BFTT Electronic Warfare Trainer (BEWT) software integration with BFTT.
- (U) (\$4,852) BFTT - Continue development of the BEWT hardware and software and install/demonstrate Engineering Development Models on Fleet directed surface ships.

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

DATE: FEBRUARY 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N

PROJECT NUMBER: 21427

PROGRAM ELEMENT TITLE: Consolidated Training  
Systems Development

PROJECT TITLE: Surface Tactical Team  
Trainer (STTT)

## 3. (U) FY 1999 PLAN:

- (U) (\$1,757) BFTT - Complete development of software required as a result of lessons learned/additional Fleet requirements since BFTT IOC to include SG&C, Display & Debrief, Entity Motioning and Modeling (EM&M) Improvements and interface to the General Navy Stimulator/Simulator.
- (U)(\$1,707) STIM/SIM - Complete development of the MK 91 NATO Sea Sparrow Missile System RF Stimulator.
- (U)(\$2,500) CST/BEWT - Integrate the BEWT into BFTT.

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Exhibit R-2, RDT&E Budget Item Justification  
(Exhibit R-2, Page 5 of 48)

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FY 1999 RDT&E BUDGET ITEM JUSTIFICATION SHEET

DATE: FEBRUARY 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N

PROJECT NUMBER: 21427

PROGRAM ELEMENT TITLE: Consolidated Training  
Systems Development

PROJECT TITLE: Surface Tactical Team  
Trainer (STTT)

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	5,178	4,948	3,761
(U) Appropriated Value:		9,948	
(U) Adjustments to FY 1998 Presidents Budget:			
(a) Undistributed Reductions	-242	-324	-297
(b) SBIR	-82	0	0
(c) BFTT CST/BEWT Integration	0	+1,000	+2,500
(U) FY 1999 PRESBUDG:	5,090	10,624	5,964

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY 1997 net decrease of (\$324K) is a result of undistributed reductions (\$242K) and a Small Business Innovative Research (SBIR) reduction of (\$82K). The FY 1998 net increase of \$676K is the result of a \$1,000K increase for the BFTT CST/BEWT Integration and undistributed reductions (\$324K). The FY 1999 net increase of \$2,203K reflects a \$2,500K plus up for the BEWT Integration, and a decrease of (\$297K) for undistributed reductions.

(U) Schedule: Prolonged contract and legal department reviews to ensure no Organizational Conflict Of Interest (OCOI) from PMS430 support contractors has precluded release of the Request For Procurement (RFP) for competitive development/production.

(U) Technical: Not Applicable.

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

DATE: FEBRUARY 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N

PROJECT NUMBER: 21427

PROGRAM ELEMENT TITLE: Consolidated Training  
Systems Development

PROJECT TITLE: Surface Tactical Team  
Trainer (STTT)

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

	<u>FY 1997</u> <u>ACTUAL</u>	<u>FY 1998</u> <u>ESTIMATE</u>	<u>FY 1999</u> <u>ESTIMATE</u>	<u>FY 2000</u> <u>ESTIMATE</u>	<u>FY 2001</u> <u>ESTIMATE</u>	<u>FY 2002</u> <u>ESTIMATE</u>	<u>FY 2003</u> <u>ESTIMATE</u>	<u>TO</u> <u>COMPLETE</u>	<u>TOTAL</u> <u>PROGRAM</u>
(U) OPN #2762	25,921	20,762	29,628	42,987	18,068	39,353	25,789	CONT.	CONT.
(U) O&MN #3B4K	6,128	8,685	10,002	9,154	10,052	9,541	9,389	CONT.	CONT.

(U) RELATED RDT&E: Not Applicable

D. (U) SCHEDULE PROFILE:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
Program Milestones	1Q BFTT B/L I M/S III 4Q BFTT B/L I IOC		
Engineering Milestones	4Q/3Q BFTT B/L I DTIII		
T&E Milestones			
Contract Milestones		3Q Stim/Sim Contract Award	2Q BEWT Contract Award

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Exhibit R-2, RDT&E Budget Item Justification  
(Exhibit R-2, Page 7 of 48)

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FY 1999 RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: FEBRUARY 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N

PROJECT NUMBER: 21427

PROGRAM ELEMENT TITLE: Consolidated Training  
Systems Development

PROJECT TITLE: Surface Tactical Team  
Trainer (STTT)

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

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Systems Engineering			
o BFTT B/L 1	102	300	109
o CST/BEWT	500	600	500
o Mine Warfare	100	100	0
o STIM/SIM	1,441	589	707
b. Technical Data			
o BFTT B/L 1	220	321	200
o CST/BEWT	500	772	1,250
o SOAM	45	0	0
o Mine Warfare	0	0	0
o STIM/SIM	0	1,000	1,000
c. Software Development			
o BFTT B/L 1	1,082	2,062	1,448
o CST/BEWT	1,000	4,480	500
o Mine Warfare	100	400	0
d. Dev. Spt. Eqpt. Acquisition			
o CST	0	0	250
Total	5,090	10,624	5,964

R-1 Line Item 159

Exhibit R-3, RDT&E PE/Project Cost Breakdown  
(Exhibit R-3, Page 8 of 48)

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FY 1999 RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: FEBRUARY 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N

PROJECT NUMBER: 21427

PROGRAM ELEMENT TITLE: Consolidated Training  
Systems Development

PROJECT TITLE: Surface Tactical Team  
Trainer (STTT)

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

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total				To Complete	Total Program
					FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget		
Product Development										
NSWC/PHD	WR/RC	10/97	CONT.	CONT.	17,882	1,660	3,211	1,418	CONT.	CONT.
NSWC/DD	WR/RC	10/98	6,578	6,578	6,378	0	200	0	0	6,578
NAWC/TSD	WR/RC	N/A	CONT.	CONT.	7,159	222	161	171	CONT.	CONT.
CSS	WR/RC	10/97	CONT.	CONT.	0	70	0	0	CONT.	CONT.
MISCELLANEOUS	VARIOUS	03/98	CONT.	CONT.	3,026	238	2,272	1,771	CONT.	CONT.
EWA	FFP	03/98	7,380	7,380	0	1,500	3,880	2,000	0	7,380
Support and Management										
MISC C/CPFF/REQN		10/97	CONT.	CONT.	979	400	150	150	CONT.	CONT.
Test and Evaluation										
NSWC/PHD	WR/RC	10/97	CONT.	CONT.	2,350	500	250	204	CONT.	CONT.

GOVERNMENT FURNISHED PROPERTY

Item Description	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Delivery Date	Total				To Complete	Total Program
				FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget		
Product Development									
MISC	RCP	10/97	60 DAYS ARO	1,500	500	500	250	CONT.	CONT.
Support and Management									
Test and Evaluation									

R-1 Line Item 159

Exhibit R-3, RDT&E PE/Project Cost Breakdown  
(Exhibit R-3, Page 9 of 48)

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FY 1999 RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: FEBRUARY 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N

PROJECT NUMBER: 21427

PROGRAM ELEMENT TITLE: Consolidated Training  
Systems Development

PROJECT TITLE: Surface Tactical Team  
Trainer (STTT)

	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Subtotal Product Development	35,945	4,190	10,224	5,610	CONT.	CONT.
Subtotal Support and Management	979	400	150	150	CONT.	CONT.
Subtotal Test and Evaluation	2,350	500	250	204	CONT.	CONT.
Total Project	39,274	5,090	10,624	5,964	CONT.	CONT.

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Exhibit R-3, RDT&E PE/Project Cost Breakdown  
(Exhibit R-3, Page 10 of 48)

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FY 1999 RDT&E BUDGET ITEM JUSTIFICATION SHEET

DATE: FEBRUARY 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N

PROGRAM ELEMENT TITLE: Consolidated Training Systems Development

(U) COST (Dollars in thousands)

PROJECT

NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
21823 Training and Modeling Systems (TMS)	3,658	8,476	8,167	8,316	10,537	8,813	9,027	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The mission of the Joint Simulation System (JSIMS) is to provide a readily available, operationally valid synthetic environment for the Commanders in Chief (CINCs), their components, other Joint organizations and the Services to: jointly train, educate, develop doctrine and tactics, formulate and assess operational plans, assess warfighting situations, define operational requirements, and provide operational inputs to the acquisition process. In short, JSIMS will provide not only an improved certified capability for inter-Service operability but also an enhanced Joint Battle Staff training capability for the warfighting CINCs. All service Executive Agents (EAs) and Development Agents (DAs) are required to contribute to the initial population of the JSIMS architecture with facilities, services and tools, to meet an Initial Operational Capability (IOC) for Joint Task Force (JTF) training of no later than 1999, and Full Operational Capability (FOC) for all service applications no later than 2003. In keeping with the premise that the Services/components are best able to define their own capabilities and functionality, the JPO will work in concert with the Services to import Service-provided functionality such as land, air, naval and littoral warfare to JSIMS. The JPO will integrate these functionalities for use by Joint Battle Staffs and by others wishing to inter-operate with one or more of the other Services, e.g., an Army/Marine/Navy/Air Force exercise. JSIMS development will be incremental. In June 1994 the Services, Director Joint Staff and Director, Defense Research and Engineering signed a Memorandum of Agreement (MOA) that established the JSIMS Program, a critical next-generation Modeling and Simulation (M&S) system. The long term goal of the agreement is to integrate the range of missions of the Armed Forces within a common framework. That framework will provide a balanced coherence of live, virtual and constructive M&S representations, with Command, Control, Communications, Computers and Intelligence (C<sup>4</sup>I) fully supported, and interfaces using real-world equipment. As the Maritime Warfare EA, OPNAV N7, on 29 Aug 1995, assigned NAVSEA as the JSIMS Maritime Development Agent (DA). The objective of the JSIMS Maritime portion of the JSIMS Program is to train at all levels of command, in all warfare areas, including joint and service specific training. JSIMS Maritime will develop the Maritime Mission Space Objects for the JSIMS Program, as well as selected portions of the core infrastructure and services to be determined when the Joint Object Model is partitioned. Additionally, JSIMS Maritime will develop products that will allow interoperability with the Navy's Tier I training system, the Battle Force Tactical Training (BFTT) Program.

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

DATE: FEBRUARY 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N

PROJECT NUMBER: 21823

PROGRAM ELEMENT TITLE: Consolidated Training  
Systems Development

PROJECT TITLE: Training and Modeling  
Systems (TMS)

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$3,658) Accomplish Build N0 System Engineering. Initiate Build N0 Software Development. Initiate Build N1 System Engineering.

2. (U) FY 1998 PLAN:

- (U)(\$8,476) Complete Build N0 Software Development. Accomplish Build N0 Test and Evaluation. Complete Build N1 System Engineering. Complete Build N1 Software Development. Accomplish Build N2 System Engineering. Initiate Build N2 Software Development. Initiate Build N3 System Engineering. Initiate Build N1 Test and Evaluation.

3. (U) FY 1999 PLAN:

- (U)(\$8,167) Complete Build N2 Software Development. Complete Build N3 System Engineering. Accomplish Build N3 Software Development. Accomplish Build N4 System Engineering. Initiate Build N4 Software Development. Initiate Build N5 System Engineering. Complete Build N1 Test and Evaluation. Accomplish Build N2 Test and Evaluation. Accomplish Build N3 Test and Evaluation.

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

DATE: FEBRUARY 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N

PROJECT NUMBER: 21823

PROGRAM ELEMENT TITLE: Consolidated Training  
Systems Development

PROJECT TITLE: Training and Modeling  
Systems (TMS)

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	4,230	8,785	8,304
(U) Appropriated Value		8,785	0
(U) Adjustments to FY 1998 Presidents Budget:			
(a) Undistributed Reductions	-5	-309	-137
(b) SBIR	-67	0	0
(c) Below Threshold Reprogrammings	-500	0	0
(U) FY 1999 PRESBUDG Submit:	3,658	8,476	8,167

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY 1997 net decrease of (\$572K) results from undistributed reductions (\$5K), a Small Business Innovative Research (SBIR) reduction (\$67K) and BTR's (\$500K). The FY 1998 net decrease of (\$309K) results from undistributed reductions. The FY 1999 net decrease of (\$137K) results from undistributed reductions.

(U) Schedule: Not Applicable

(U) Technical: Not Applicable.

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

DATE: FEBRUARY 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N

PROJECT NUMBER: 21823

PROGRAM ELEMENT TITLE: Consolidated Training  
Systems Development

PROJECT TITLE: Training and Modeling  
Systems (TMS)

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

(U) FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	TO	TOTAL
<u>ACTUAL</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>COMPLETE</u>	<u>PROGRAM</u>
JSIMS - M:								
(U) OPN LI #2762								
0	2,560	2,222	3,546	3,330	3,356	3,389	CONT.	CONT.

(U) RELATED RDT&E: NOT APPLICABLE

R-1 Line Item 159

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

DATE: FEBRUARY 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N

PROJECT NUMBER: 21823

PROGRAM ELEMENT TITLE: Consolidated Training  
Systems Development

PROJECT TITLE: Training and Modeling  
Systems (TMS)

## D. (U) SCHEDULE PROFILE:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
Program Milestones			
Engineering Milestones			
Build N0	3Q/1Q		
Build N1	4Q/4Q		
Build N2		2Q/2Q	
Build N3		4Q/3Q	
Build N4			1Q/3Q
Build N5			3Q/3Q-FY01
Build N6			
Build N7			
T&E Milestones			
Build N0		1Q/2Q	
Build N1		4Q/1Q	
Build N2			2Q/4Q
Build N3			3Q/4Q
Build N4			
Build N5			
Build N6			
Build N7			
Contract Milestones			

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

DATE: FEBRUARY 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N

PROJECT NUMBER: 21823

PROGRAM ELEMENT TITLE: Consolidated Training  
Systems Development

PROJECT TITLE: Training and Modeling  
Systems (TMS)

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

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Requirements Definition	1,728	1,700	920
b. System Engineering	1,000	2,000	2,000
c. Software Development/Demo			
o Build N0	530	656	0
o Build N1	400	2,091	245
o Build N2	0	1,529	1,500
o Build N3	0	500	1,752
o Build N4			1,500
o Build N5			250
o Build N6			
Total	3,658	8,476	8,167

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Exhibit R-3, RDT&E PE/Project Cost Breakdown  
(Exhibit R-3, Page 16 of 48)

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FY 1999 RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: FEBRUARY 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N

PROJECT NUMBER: 21823

PROGRAM ELEMENT TITLE: Consolidated Training  
Systems Development

PROJECT TITLE: Training and Modeling  
Systems (TMS)

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

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development										
NSWC/PHD	WR/RC	10/97	CONT.	CONT.	0	412	1,000	1,000	CONT.	CONT.
NAWC/TSD	WR/RC	10/97	CONT.	CONT.	0	237	250	275	CONT.	CONT.
NRAD	WR/RC	10/97	CONT.	CONT.	0	1,384	5,461	5,192	CONT.	CONT.
MISC C.CPFF/ REQN		10/97	CONT.	CONT.	0	1,362	1,365	1,250	CONT.	CONT.
Support and Management										
MISC C/CPFF/REQN		10/97	CONT.	CONT.	0	188	250	250	CONT.	CONT.
Test and Evaluation:										
NSWC/PHD	WR/RC	10/97	CONT.	CONT.	0	75	150	200	CONT.	CONT.

GOVERNMENT FURNISHED PROPERTY: Not Applicable.

Item Description	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development										
NRad	WR/RC	10/97	CONT.	CONT.	0	0	0	0	CONT.	CONT.

Support and Management:

Test and Evaluation:

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Exhibit R-3, RDT&E PE/Project Cost Breakdown  
(Exhibit R-3, Page 17 of 48)

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FY 1999 RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: FEBRUARY 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N

PROJECT NUMBER: 21823

PROGRAM ELEMENT TITLE: Consolidated Training  
Systems Development

PROJECT TITLE: Training and Modeling  
Systems (TMS)

	<u>Total</u> <u>FY 1996</u> <u>&amp; Prior</u>	<u>FY 1997</u> <u>Budget</u>	<u>FY 1998</u> <u>Budget</u>	<u>FY 1999</u> <u>Budget</u>	<u>To</u> <u>Complete</u>	<u>Total</u> <u>Program</u>
Subtotal Product Development	0	3,395	8,076	7,717	CONT.	CONT.
Subtotal Support and Management	0	188	250	250	CONT.	CONT.
Subtotal Test and Evaluation	0	75	150	200	CONT.	CONT.
Total Project	0	3,658	8,476	8,167	CONT.	CONT.

R-1 Line Item 159

Exhibit R-3, RDT&E PE/Project Cost Breakdown  
(Exhibit R-3, Page 18 of 48)

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FY 1999 RDT&E BUDGET ITEM JUSTIFICATION SHEET

DATE: FEBRUARY 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N

PROGRAM ELEMENT TITLE: Consolidated Training Systems Development

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
W0431 Tactical Aircrew Combat Training System (TACTS)	3,508	3,367	3,069	4,934	4,897	6,174	6,254	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project develops new TACTS capabilities primarily through the integration of additional types of aircraft and weapons. This requires development of new aircraft interfaces, weapons and countermeasures simulations, and modifications to displays. Software is also developed to produce computer generated Electronic Warfare (EW) threats to enhance the system's ability to provide training in a realistic EW environment. Various other system performance improvements are also developed to make the system more effective and reliable.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$201) Aircraft Integration - Completed the development of training capabilities for the F/A-18E/F.
- (U) (\$1,359) Weapons Integration - Continued the development of the Phoenix training capability for the F-14. Completed development of an initial Advanced Medium Range Air to Air Missile (AMRAAM) training capability for the F/A-18.
- (U) (\$1,756) System Upgrades - Continued the development of block 6.0/A10 software as well as other system improvements. Continued the development of the Advanced Message & Oriented Data Security Module (AMODSM).
- (U) (\$192) Studies/Analysis/T&E - Conducted development testing of the AMODSM.

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

DATE: FEBRUARY 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N

PROJECT NUMBER: WO431

PROGRAM ELEMENT TITLE: Consolidated Training  
Systems Development

PROJECT TITLE: Tactical Aircrew Combat  
Training System (TACTS)

## 2. (U) FY 1998 PLAN:

- (U) (\$755) Weapons Integration - Complete the development of the Phoenix training capability for the F-14. Resume development of a Joint Stand-Off Weapon (JSOW) training capability.
- (U) (\$2,441) System Upgrades - Continue development of block 6.0 and A10 software. Complete development of the AMODSM.
- (U) (\$171) Studies/Analysis/T&E - Develop test procedures for testing block 6.0 and A10 software.

## 3. (U) FY 1999 PLAN:

- (U) (\$1,165) Weapons Integration - Complete development of a training capability for JSOW.
- (U) (\$1,674) System Upgrades - Complete development of block 6.0 and A10 software.
- (U) (\$230) Studies/Analysis/T&E - Test block 6.0 and A10 software.

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

DATE: FEBRUARY 1998

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0204571N      PROJECT NUMBER: WO431  
PROGRAM ELEMENT TITLE: Consolidated Training      PROJECT TITLE: Tactical Aircrew Combat  
Systems Development      Training System (TACTS)

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	3,346	3,512	3,112
(U) Appropriated Value:		3,512	
(U) Adjustments to FY 1998 Presidents Budget:	+162	-145	-43
(U) FY 1999 PRESBUDG Submit:	3,508	3,367	3,069

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY97 increase of +\$162 thousand is a result of a +\$245 thousand minor programmatic adjustment, a -\$79 thousand decrease for Small Business Innovative Research Assessment, and a decrease of -\$4 thousand for revised economic assumptions. The FY98 decrease of -\$145 thousand reflects Congressional undistributed reductions. The FY99 decrease of -\$43 thousand reflects minor program and economic adjustments.

(U) Schedule: The following milestones have been changed due to program restructure:

From	To
AMODSM DT-II 3Q-4Q/97	AMODSM DT-II 1Q-2Q/98
A10 DT-II 3Q-4Q/98	A10 DT-II 1Q-4Q/99

(U) Technical: Not Applicable.

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Exhibit R-2, RDT&E Budget Item Justification  
(Exhibit R-2, Page 21 of 48)

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FY 1999 RDT&E BUDGET ITEM JUSTIFICATION SHEET

DATE: FEBRUARY 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N

PROJECT NUMBER: WO431

PROGRAM ELEMENT TITLE: Consolidated Training  
Systems Development

PROJECT TITLE: Tactical Aircrew Combat  
Training System (TACTS)

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

	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
(U) OPN/P-1 #127	1,250	0	767	1,766	1,447	0	0	0	0
(U) APN/P-1 #52	1,028	0	224	4,241	0	0	0	0	0

(U) RELATED RDT&E:

(U) PE 0604735F (Range Improvement) - Includes funding for joint efforts with USAF.

D. (U) SCHEDULE PROFILE:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>TO COMPLETE</u>
Program Milestones				
Engineering Milestones			1Q/4Q A10 DT-II	
T&E Milestones		1Q/2Q AMODSM DT-II	1Q/4Q Blk 6.0 DT-II	
Contract Milestones				

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

DATE: FEBRUARY 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N

PROJECT NUMBER: WO431

PROGRAM ELEMENT TITLE: Consolidated Training  
Systems Development

PROJECT TITLE: Tactical Aircrew Combat  
Training System (TACTS)

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

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Systems/Software Development	2,752	3,151	2,689
b. T&E	121	40	100
c. Systems Engineering	605	145	250
d. Travel	30	31	30
Total	3,508	3,367	3,069

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Exhibit R-3,RDT&E PE/Project Cost Breakdown  
(Exhibit R-3, Page 23 of 48)

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FY 1999 RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: FEBRUARY 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N

PROJECT NUMBER: W0431

PROGRAM ELEMENT TITLE: Consolidated Training  
Systems Development

PROJECT TITLE: Tactical Aircrew Combat  
Training System (TACTS)

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

### PERFORMING ORGANIZATIONS

<u>Contractor/ Government Performing Activity</u>	<u>Contract Method/ Fund Type Vehicle</u>	<u>Award/ Oblig Date</u>	<u>Perform Activity EAC</u>	<u>Project Office EAC</u>	<u>*Total FY 1996 &amp; Prior</u>	<u>FY 1997 Budget</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Product Development Miscellaneous	Various	1Q/99	CONT.	CONT.	25,466	2,782	3,182	2,719	CONT.	CONT.
Support and Management Miscellaneous	Various	1Q/99	CONT.	CONT.	14,130	605	145	250	CONT.	CONT.
Test and Evaluation Miscellaneous	Various	1Q/99	CONT.	CONT.	3,490	121	40	100	CONT.	CONT.

GOVERNMENT FURNISHED PROPERTY: Not Applicable

\*This amount includes FY 90-FY 96

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Exhibit R-3,RDT&E PE/Project Cost Breakdown  
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FY 1999 RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: FEBRUARY 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N

PROJECT NUMBER: WO431

PROGRAM ELEMENT TITLE: Consolidated Training  
Systems Development

PROJECT TITLE: Tactical Aircrew Combat  
Training System (TACTS)

	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Subtotal Product Development	25,466	2,782	3,182	2,719	CONT.	CONT.
Subtotal Systems Engr/Management	14,130	605	145	250	CONT.	CONT.
Subtotal Test and Evaluation	3,490	121	40	100	CONT.	CONT.
Total Project	43,086	3,508	3,367	3,069	CONT.	CONT.

R-1 Line Item 159

Exhibit R-3,RDT&E PE/Project Cost Breakdown  
(Exhibit R-3, Page 25 of 48)

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FY 1999 RDT&E BUDGET ITEM JUSTIFICATION SHEET

DATE: FEBRUARY 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N

PROGRAM ELEMENT TITLE: Consolidated Training Systems Development

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
W0604	Training Range and Instrumentation Development (TRID)								
	8,121	8,985	2,195	1,734	1,058	2,065	1,678	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project develops specialized instrumentation systems for fleet readiness training while minimizing life cycle costs. Tasks include development of the following: Range Electronic Warfare Simulators (REWS) and associated subsystems, Target Control Systems, Large Area Tracking Range (LATR), Underwater Training System-Mobile (UTS-M), Shallow Water Training Ranges interoperability and information architecture, mine countermeasures, Shallow Water Range activity includes establishment of capability at Pacific Missile Range Facility (PMRF) (Phase I) and in the MAUI basin (Phase II) at Hawaii Island Shallow Water Training Range (HISWTR), and assorted Advanced Weapons Training Systems (AWTS), such as Imaging Weapons Training Systems (IWTS), Weapons Impact Scoring Set (WISS) and Remote Strafe Scoring Systems.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$1,000) Initiated development of IWTS Pre-Planned Product Improvement (P<sup>3</sup>I). Continued development of Remote Strafe Scoring System (RSSS) Product Improvement Program (PIP).
- (U) (\$129) Continued to support development of Next Generation Target Control System (NGTCS).
- (U) (\$1,940) Completed technology development for Continental United States (CONUS) Shallow Water Range (SWR) to meet FY 97 MS III. Discontinued technology development for UTS(M) underwater telemetry UTS(M) (unaffordable at this time). Continued development for phase II of HI SWTR. Conducted technology development to incorporate NGSS capability into underwater ranges.
- (U) (\$260) Continued systems definitions, development of specifications, analysis of concepts, and systems engineering to improve interoperability of the existing range infrastructure. Continued systems engineering efforts for range integration and initiated development of a common range architecture that meets High Level Architecture (HLA) and Defense Information Infrastructure standards.

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

DATE: FEBRUARY 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N

PROJECT NUMBER: W0604

PROGRAM ELEMENT TITLE: Consolidated Training  
Systems Development

PROJECT TITLE: Training Range and  
Instrumentation  
Development

- (U) (\$100) Conducted analyses of design data to ensure that Tactical Training Range (TTR) programs are logistically supportable. Provided technical support for TTR programs scheduled for Naval Aviation Systems Team.
- (U) (\$4,692) Congressionally directed funding for the Pacific Missile Range Facility (PMRF) Optical Sensors Project. Developing state of the art Electro-Optical Sensors that will provide the data collection systems the capability of performing surveillance acquisition, tracking, and identification of low observable objects at PMRF.

2. (U) FY 1998 PLAN:

- (U) (\$958) Complete development and testing of RSSS PIP. Continue development of IWTS P<sup>3</sup>I.
- (U) (\$249) Complete support development and testing of NGTCS.
- (U) (\$2,151) Continue technology development for CONUS shallow water ranges. Complete phase I of HI SWTR and continue development of Phase II. Commence technology development to incorporate MCM capability into underwater ranges.
- (U) (\$775) Continue systems definitions, development of specifications, analysis of concepts, and systems engineering for developing improved interoperability among various projects. Continue systems engineering efforts for range integration using DIS technology and continue development of common range architecture that meets HLA standards and conduct analyses of design data to ensure that TTR programs are logistically supportable.
- (U) (\$4,852) Continue PMRF Optical Sensors Project.

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Exhibit R-2, Budget Item Justification  
(Exhibit R-2, Page 27 of 48)

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FY 1999 RDT&E BUDGET ITEM JUSTIFICATION SHEET

DATE: FEBRUARY 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N

PROJECT NUMBER: W0604

PROGRAM ELEMENT TITLE: Consolidated Training  
Systems Development

PROJECT TITLE: Training Range and  
Instrumentation  
Development

3. (U) FY 1999 PLAN:

- (U) (\$792) Continue development of IWTS P<sup>3</sup>I. Conduct testing and obtain MS III of RSSS PIP. Continue investigation of AWTS requirements.
- (U) (\$494) Continue technology development to incorporate MCM capability into underwater ranges.
- (U) (\$416) Continue systems definitions, development of specifications, analysis of concepts, and systems engineering for various projects. Continue systems engineering efforts for range integration and continue development of common range architecture that meets HLA standards, and conduct analyses of design data to ensure that TTR programs are logistically supportable.
- (U) (\$493) Interface LATR development with the Joint Maritime Communications Information System (JMCIS) and Global Command and Control System (GCCS). Upgrade LATR display systems and improve LATR hardware/software interface with existing training systems.

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

DATE: FEBRUARY 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N

PROJECT NUMBER: W0604

PROGRAM ELEMENT TITLE: Consolidated Training  
Systems Development

PROJECT TITLE: Training Range and  
Instrumentation  
Development

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	12,993	4,315	4,500
(U) Appropriated Value:		9,315	
(U) Adjustments to FY 1998 Presidents Budget:	-4,872	4,818	-2,305
(U) FY 1999 PRESBUDG Submit:	8,121	9,133	2,195

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY97 decrease of -\$4,872 thousand reflects -\$4,242 thousand transfer of funds to Other Procurement Navy appropriation based on a reclassification action for congressionally directed Large Area Tracking Range Air Combat Maneuvering Instrumentation at the Pacific Missile Range Facility, -\$197 thousand for Small Business Innovative Research assessment, and -\$433 thousand in minor programmatic and economic adjustments. The FY98 increase of \$4,818 thousand is a result of a \$5,000 thousand congressional add for Optical Sensors and a decrease of -\$182 thousand reflects Congressional undistributed reductions. The FY99 decrease of -\$2,305 thousand reflects a change in program requirements, which resulted in the re-scope of the IWTS, UTS(M) and NGTCS programs. A minor portion of the decrease is associated with economic adjustments.

(U) Schedule: Milestones have changed due to program restructure.

The following milestones have been changed:

From	To
IWTS P <sup>3</sup> I DT-II 1Q/96-1Q/99	IWTS P <sup>3</sup> I DT-II 3Q/00-4Q/00
SWR MS-III 2Q/97	SWR MS-III 3Q/97
Phase II SWTR Contract Award 3Q/97	Phase II SWTR Contract Award 4Q/97
RSSS PIP DT-II 4Q/97-4Q/98	RSSS PIP DT-II 1Q/98-4Q/98
RSSS PIP MS-III 4Q/98	RSSS PIP MS-III 1Q/99

(U) Technical: Not Applicable.

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

DATE: FEBRUARY 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N

PROJECT NUMBER: W0604

PROGRAM ELEMENT TITLE: Consolidated Training  
Systems Development

PROJECT TITLE: Training Range and  
Instrumentation

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

	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	TO	TOTAL
	<u>ACTUAL</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>COMPLETE</u>	<u>PROGRAM</u>
(U) OPN/P-1 #127	19,966	3,348	6,782	14,611	20,795	17,234	17,473	CONT.	CONT.

(U) RELATED RDT&E: Not Applicable.

D. (U) SCHEDULE PROFILE:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>TO COMPLETE</u>
Program	3Q Phase II SWTR MS-III			
Milestones	3Q SWR MS-III			
			1Q RSSS PIP MS III	
Engineering				
Milestones				
T&E		1Q/98-4Q/98 RSSS PIP DT-II		3Q/00-4Q/00
Milestones				P <sup>3</sup> I DT-II
Contract	4Q Phase II SWTR			
Milestones	Contract Award			

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Exhibit R-2, Budget Item Justification  
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# UNCLASSIFIED

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FY 1999 RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: FEBRUARY 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N

PROJECT NUMBER: W0604

PROGRAM ELEMENT TITLE: Consolidated Training  
Systems Development

PROJECT TITLE: Training Range and  
Instrumentation  
Development

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

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Systems Engineering and Software Development			
· AWTS	871	816	670
· UTS, SWR and MCM	1,842	2,003	494
· Target Control System Integration	129	249	0
· Range Integration Requirements	209	614	231
· LATR	0	0	493
b. Range Requirements & Engineering Technical Services and Support	329	389	244
d. Travel	49	62	63
e. Funding for PMRF Optical Sensors	4,692	4,852	0
Total	8,121	8,985	2,195

R-1 Line Item 159

Exhibit R-3, RDT&E PE/Project Cost Breakdown  
(Exhibit R-3, Page 31 of 48)

# UNCLASSIFIED

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FY 1999 RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: FEBRUARY 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N

PROJECT NUMBER: W0604

PROGRAM ELEMENT TITLE: Consolidated Training  
Systems Development

PROJECT TITLE: Training Range and  
Instrumentation  
Development

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

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total* FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development										
NUWC/NEWPORT,RI	WX	N/A	CONT.	CONT.	26,672				CONT.	CONT.
Miscellaneous	WX	1Q/99	CONT.	CONT.	45,152	3,100	3,744	1,951	CONT.	CONT.
BMDO	MIPR	4Q/98	4,692	4,692	0	4,692	4,852	0	0	4,692
Support and Management										
Miscellaneous	RC/WX	1Q/99	CONT.	CONT.	9,570	329	389	244	CONT.	CONT.

Test and Evaluation: None

GOVERNMENT FURNISHED PROPERTY: Not Applicable.

\*This includes FY90-FY96.

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Exhibit R-3, RDT&E PE/Project Cost Breakdown  
(Exhibit R-3, Page 32 of 48)

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FY 1999 RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: FEBRUARY 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N

PROJECT NUMBER: W0604

PROGRAM ELEMENT TITLE: Consolidated Training  
Systems Development

PROJECT TITLE: Training Range and  
Instrumentation  
Development

	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Subtotal Product Development	71,824	3,100	3,744	1,951	CONT.	CONT.
Subtotal Support and Management	9,570	329	389	244	CONT.	CONT.
Funding for PMRF Optical Sensors		4,692	4,852		0	4,692
Total Project	81,394	8,121	8,985	2,195	CONT.	CONT.

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Exhibit R-3, RDT&E PE/Project Cost Breakdown  
(Exhibit R-3, Page 33 of 48)

# UNCLASSIFIED

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FY 1999 RDT&E BUDGET ITEM JUSTIFICATION SHEET

DATE: FEBRUARY 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N

PROGRAM ELEMENT TITLE: Consolidated Training Systems Development

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
W1998 Joint Tactical Combat Training System (JTCTS)	19,674	32,365	6,942	7,910	7,937	6,001	5,059	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Joint Tactical Combat Training System (JTCTS) was initially planned to provide a fixed, transportable, and mobile range instrumentation equipment for the USN and USAF for both shore-based and deployable applications. The fixed application provides shore-based tactical aircrew training while the mobile application will provide deployable at-sea single platform to multi-platform (surface ship, submarine and aircraft) and Naval Expeditionary Force multi-warfare training. To accomplish this, the JTCTS instrumentation is being designed to develop and transmit exercise scenarios; simulate/stimulate all exercise participants sensors/weapons with the exercise scenario, track all exercise participants and events, e.g., weapons engagements; and provide accurate, realistic, and timely exercise feedback. JTCTS is building on technology developed for existing Tactical Training Ranges Systems including the Tactical Aircrew Combat Training System, Mobile Sea Range, Large Area Tracking Range, and the capabilities developed for the in-port Battle Force Tactical Training Program. JTCTS incorporates the Defense Modeling and Simulation Office sponsored Distributed Interactive Simulation protocol data unit and the Higher Level Architecture for interoperability with Navy and other service live, virtual (simulators), and constructive (war games) simulations.

Based on the reduced funding profile that has occurred since the previous President's Budget, the JTCTS program was restructured. The program schedule has been restructured to a more evolutionary approach which develops/fields a mobile, rangeless capability first; followed by the development/fielding of a fixed air range capability and finally the development/fielding of a fleet battle group capability. The first part of the approach additionally will meet an urgent fleet requirement for a mobile rangeless air combat capability delivered to Carrier Air Wing Five (CVW-5) by the end of FY99. The CVW-5 requirement will be met by leaving in place the JTCTS development prototype after operational testing with CVW-5, thus providing an interim training capability to CVW-5 after fully testing the system within a robust operational environment.

R-1 Line Item 159

Exhibit R-2, Budget Item Justification  
(Exhibit R-2, Page 34 of 48)

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FY 1999 RDT&E BUDGET ITEM JUSTIFICATION SHEET

DATE: FEBRUARY 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N

PROJECT NUMBER: W1998

PROGRAM ELEMENT TITLE: Consolidated Training  
Systems Development

PROJECT TITLE: Joint Tactical Combat  
Training System (JTCTS)

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$14,391) Continued contract for Engineering Development Model (EDM) software/hardware development.
- (U) (\$4,980) Monitored contractor progress, coordinated subsystem engineering development/integration.
- (U) (\$303) Conducted Critical Design Review (CDR).

2. (U) FY 1998 PLAN:

- (U) (\$26,162) Complete software/hardware development, site/platform integration, development testing and hardware manufacturing. Support government testing.
- (U) (\$6,203) Monitor software development, hardware/software integration, development testing and hardware manufacturing. Begin government development testing. Prepare platform site for integration development testing.

3. (U) FY 1999 PLAN:

- (U) (\$3,300) Complete software/hardware development for air combat capability. Production readiness testing and evaluation for risk reduction, develop, integrate and test additional capabilities deferred from initial baseline. Deliver and install on CV-63/CVW-5.
- (U) (\$2,316) Conduct system platform integration testing. Complete government development operational testing. Leave prototype JTCTS system in place for fleet use.
- (U) (\$1,326) Monitor contractor progress, coordinate subsystem development/test.

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Exhibit R-2, Budget Item Justification  
(Exhibit R-2, Page 35 of 48)

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FY 1999 RDT&E BUDGET ITEM JUSTIFICATION SHEET

DATE: FEBRUARY 1998

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0204571N      PROJECT NUMBER: W1998  
PROGRAM ELEMENT TITLE: Consolidated Training      PROJECT TITLE: Joint Tactical Combat  
Systems Development      Training System (JTCTS)

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	19,973	33,623	23,765
(U) Appropriated Value:		33,967	
(U) Adjustments to FY 1998 Presidents Budget:	-299	-1,258	-16,823
(U) FY 1999 PRESBUDG Submit	19,674	32,365	6,942

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY97 decrease of -\$299 thousand reflects minor pricing adjustments. The FY98 decrease of -\$1,258 thousand reflects Congressional undistributed reductions. The FY99 decrease of -\$16,823 thousand reflects a program restructure.

R-1 Line Item 159

Exhibit R-2, Budget Item Justification  
(Exhibit R-2, Page 36 of 48)

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FY 1999 RDT&E BUDGET ITEM JUSTIFICATION SHEET

DATE: FEBRUARY 1998

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0204571N      PROJECT NUMBER: W1998  
PROGRAM ELEMENT TITLE: Consolidated Training      PROJECT TITLE: Joint Tactical Combat  
Systems Development      Training System (JTCTS)

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

From	To
Phase I Contractor Acceptance testing 2Q/98-3Q/98	Contractor Laboratory testing 3Q/98-2Q/99
Phase II Contractor Acceptance testing 3Q/99-1Q/00	Contractor Acceptance testing 3Q/99-4Q/99
Phase I DT/OT 3Q/98-1Q/99	DT/OT 3Q/99-4Q/99
Initial Production Decision 1Q/99	Initial Production Decision 1Q/00
LRIP Contract Award 2Q/99	LRIP Contract Award 1Q/00
MS III 2Q/01	MS III 1Q/02

Due to the restructuring of the JTCTS program, software PDR and CDR were added:

SW PDR 3Q/98  
SW CDR 4Q/98

The following milestones are to be determined pending finalization of the Test and Evaluation Marker plan:

OPEVAL  
TECHEVAL

(U) Technical: Not Applicable.

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Exhibit R-2, Budget Item Justification  
(Exhibit R-2, Page 37 of 48)

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FY 1999 RDT&E BUDGET ITEM JUSTIFICATION SHEET

DATE: FEBRUARY 1998

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0204571N      PROJECT NUMBER: W1998  
PROGRAM ELEMENT TITLE: Consolidated Training      PROJECT TITLE: Joint Tactical Combat  
Systems Development      Training System (JTCTS)

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

	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
(U) OPN/P-1 #127	0	0	0	1,485	2,032	2,988	2,205	CONT.	CONT.
(U) APN/P-1 #52	0	0	0	14,764	15,402	16,293	16,269	CONT.	CONT.

(U) RELATED RDT&E: Joint program with USAF Program Element 0604735F

D. (U) SCHEDULE PROFILE:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>TO COMPLETE</u>
Program Milestones				Initial Production Decision 1Q/00 MS III 1Q/02
Engineering Milestones	CDR 2Q (H/W)	PDR 3Q(S/W) CDR 4Q(S/W)		
T&E Milestones		Contractor laboratory testing 3Q/98-2Q/99	Contractor acceptance testing 3Q/99-4Q/99	
			DT/OT 3Q/99-4Q/99	
Contract Milestones				LRIP Award 1Q/00

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Exhibit R-2, Budget Item Justification  
(Exhibit R-2, Page 38 of 48)

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FY 1999 RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: FEBRUARY 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N

PROJECT NUMBER: W1998

PROGRAM ELEMENT TITLE: Consolidated Training  
Systems Development

PROJECT TITLE: Joint Tactical Combat  
Training System (JTCTS)

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

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Mobile Rangeless EDM Development	14,391	26,162	3,300
b. Government Engineering & Technical Support	4,004	4,927	2,316
c. Engineering & Technical Services	1,193	1,163	1,214
d. Travel	86	113	112
Total	19,674	32,365	6,942

R-1 Line Item 159

Exhibit R-3, RDT&E PE/Project Cost Breakdown  
(Exhibit R-3, Page 39 of 48)

# UNCLASSIFIED

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FY 1999 RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: FEBRUARY 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N

PROJECT NUMBER: W1998

PROGRAM ELEMENT TITLE: Consolidated Training  
Systems Development

PROJECT TITLE: Joint Tactical Combat  
Training System (JTCTS)

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

### PERFORMING ORGANIZATIONS

<u>Contractor/ Government Performing Activity</u>	<u>Contract Method/ Fund Type Vehicle</u>	<u>Award/ Oblig Date</u>	<u>Perform Activity EAC</u>	<u>Project Office EAC</u>	<u>Total* FY 1996 &amp; Prior</u>	<u>FY 1997 Budget</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Product Development										
Raytheon Division, Providence RI/Loral Space & Range Systems, Sunnyvale, CA										
TRW,FFX,VA	C/CPAF	1Q/93	3,900	3,900	3,900	0	0	0	0	3,900
Raytheon	C/CPAF	2Q/95	CONT.	CONT.	40,736	14,391	26,162	3,300	CONT.	CONT.
NAWC AD PAX	WX	1Q/99	CONT.	CONT.	12,724	3,254	2,463	1,158	CONT.	CONT.
Miscellaneous	WX	N/A	CONT.	CONT.	4,243	271	113	112	CONT.	CONT.
Support and Management										
Miscellaneous RCP		1Q/99	CONT.	CONT.	5,952	1,101	1,163	1,214	CONT.	CONT.
Test & Evaluation:										
NAWC AD PAX	WX	1Q/99	CONT.	CONT.	0	657	2,464	1,158	CONT.	CONT.

GOVERNMENT FURNISHED PROPERTY Not Applicable.

\*This includes FY90-FY96.

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Exhibit R-3, RDT&E PE/Project Cost Breakdown  
(Exhibit R-3, Page 40 of 48)

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FY 1999 RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: FEBRUARY 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N

PROJECT NUMBER: W1998

PROGRAM ELEMENT TITLE: Consolidated Training  
Systems Development

PROJECT TITLE: Joint Tactical Combat  
Training System (JTCTS)

	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Subtotal Product Development	61,603	17,916	28,738	4,570	CONT.	CONT.
Subtotal Support and Management	5,952	1,101	1,163	1,214	CONT.	CONT.
Subtotal Test and Evaluation	0	657	2,464	1,158	CONT.	CONT.
Total Project	67,555	19,674	32,365	6,942	CONT.	CONT.

R-1 Line Item 159

Exhibit R-3, RDT&E PE/Project Cost Breakdown  
(Exhibit R-3, Page 41 of 48)

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FY 1999 RDT&E BUDGET ITEM JUSTIFICATION SHEET

DATE: FEBRUARY 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N

PROGRAM ELEMENT TITLE: Consolidated Training Systems Development

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
W2124 Air Warfare Training Development (AWTD)	1,716	1,972	2,053	2,167	2,219	1,979	2,216	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project develops new training system technologies for use in naval aviation training. Tasks include: 1) Mission rehearsal technologies develops new and emerging aviation training technologies to provide a transportable, modular, high fidelity mission rehearsal capability. Mission rehearsal is defined as the practice of planned tasks and functions critical to mission success using a true-to-life, interactive representation of the expected operating environment. Technologies to be developed and integrated include helmet mounted and/or flat panel displays, photographic quality image generation, environmental effects models, radar/infra-red/electro-optic and acoustic sensor simulations; and 2) Aviation Training Technology Integration Facility (ATTIF) is a man-in-the-loop test bed for the integration of software, hardware, mission management systems, and threat environment simulations. ATTIF was formally an ARPA project known as What-If Simulation Systems for Advanced Research & Development. ATTIF includes a Distributed Interactive Simulation node for participation in fleet exercise synthetic battlespace. This capability provides a window to fleet aviators for critical comment, evaluation, and fine tuning of new and innovative technology before it is fielded.

R-1 Line Item 159

Exhibit R-2, Budget Item Justification  
(Exhibit R-2, Page 42 of 48)

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FY 1999 RDT&E BUDGET ITEM JUSTIFICATION SHEET

DATE: FEBRUARY 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N

PROJECT NUMBER: W2124

PROGRAM ELEMENT TITLE: Consolidated Training  
Systems Development

PROJECT TITLE: Air Warfare Training  
Development (AWTD)

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$353) Determined performance level specification for Mission Rehearsal displays and acoustics.
- (U) (\$500) Upgraded Helmet Mounted Display test bed and integrated with Tactical Operational Preview Scene (TOPSCENE) system. TOPSCENE is a generic mission rehearsal trainer.
- (U) (\$293) Photographic imagery upgrade for TOPSCENE system.
- (U) (\$570) Achieved preliminary operating capability for ATTIF.

2. (U) FY 1998 PLAN:

- (U) (\$423) Continue performance level specification for Mission Rehearsal image generators.
- (U) (\$416) Determine sensor, environmental, and threat modeling performance level specifications.
- (U) (\$350) Integrate display, image generator, and effects modeling systems.
- (U) (\$783) Reach Initial Operational Capability (IOC) for ATTIF for F-14 prototype demonstrations.

3. (U) FY 1999 PLAN:

- (U) (\$698) Demonstrate F-14 concept mission rehearsal system and evaluate.
- (U) (\$630) Reach IOC for ATTIF for AV-8B transportable concept demonstration evaluation.
- (U) (\$725) Demonstrate and evaluate AV-8B concept transportable mission rehearsal system.

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Exhibit R-2, Budget Item Justification  
(Exhibit R-2, Page 43 of 48)

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FY 1999 RDT&E BUDGET ITEM JUSTIFICATION SHEET

DATE: FEBRUARY 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N

PROJECT NUMBER: W2124

PROGRAM ELEMENT TITLE: Consolidated Training  
Systems Development

PROJECT TITLE: Air Warfare Training  
Development (AWTD)

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	1,743	2,106	2,113
(U) Appropriated Value:		2,106	
(U) Adjustments to FY President's Budget:	-27	-134	-60
(U) FY 1999 PRESBDG Submit:	1,716	1,972	2,053

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY97 adjustment of -\$27 thousand reflects a Small Business Innovative Research (SBIR) Assessment. The FY98 adjustment of -\$134 thousand reflects Congressional undistributed reductions. The FY99 adjustment of -\$60 thousand reflects Navy Working Capital Fund Surcharge and rate adjustment of \$3 thousand; a decrease of -\$27 thousand for minor program adjustments; and a decrease of -\$36 thousand for economic adjustments.

(U) Schedule: Not Applicable.

(U) Technical: Not Applicable.

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

(U) APN/P1# BA-7 (47C2) Common Ground Equipment

<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>TO</u>	<u>TOTAL</u>
<u>ACTUAL</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>COMPLETE</u>	<u>PROGRAM</u>
0	0	0	1,000	7,000	5,000	5,000	<u>CONT.</u>	<u>CONT.</u>

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Exhibit R-2, Budget Item Justification  
(Exhibit R-2, Page 44 of 48)

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FY 1999 RDT&E BUDGET ITEM JUSTIFICATION SHEET

DATE: FEBRUARY 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N

PROJECT NUMBER: W2124

PROGRAM ELEMENT TITLE: Consolidated Training  
Systems Development

PROJECT TITLE: Air Warfare Training  
Development (AWTD)

(U) RELATED RDT&E: Not Applicable.

D. (U) SCHEDULE PROFILE:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>TO COMPLETE</u>
Program Milestones	MISSION REHEARSAL 2Q/3Q INTEG PLAN			Init Production Decision 4Q/01
Engineering Milestones	MISSION REHEARSAL 2Q/4Q PERF SPEC			PDR 1Q/00 CDR 4Q/00
T&E Milestones			Fleet Project Team Testing 1Q/99-2Q/01	
Contract Milestones	MISSION REHEARSAL 4Q/97-3Q/98 Prototype Pkg			

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Exhibit R-2, Budget Item Justification  
(Exhibit R-2, Page 45 of 48)

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FY 1999 RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: FEBRUARY 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N

PROJECT NUMBER: W2124

PROGRAM ELEMENT TITLE: Consolidated Training  
Systems Development

PROJECT TITLE: Air Warfare Training  
Development (AWTD)

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

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Primary Hardware Development	1,332	1,236	600
b. Government Engineering Support	353	480	328
c. Developmental Test and Evaluation	0	225	1,094
d. Travel	31	31	31
Total	1,716	1,972	2,053

R-1 Line Item 159

Exhibit R-3, RDT&E PE/Project Cost Breakdown  
(Exhibit R-3, Page 46 of 48)

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FY 1999 RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: FEBRUARY 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N

PROJECT NUMBER: W2124

PROGRAM ELEMENT TITLE: Consolidated Training  
Systems Development

PROJECT TITLE: Air Warfare Training  
Development (AWTD)

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

### PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY1996 & Prior	FY1997 Budget	FY1998 Budget	FY1999 Budget	To Complete	Total Program
Product Development										
Miscellaneous	WX	11/98	CONT.	CONT.	4,867	1,305	1,071	635	CONT.	CONT.
Support and Management										
Miscellaneous	WX	11/98	CONT.	CONT.	1,297	31	31	31	CONT.	CONT.
Test and Evaluation										
Miscellaneous	MIPR/WX	11/98	CONT.	CONT.	0	380	870	1,387	CONT.	CONT.

GOVERNMENT FURNISHED PROPERTY: NOT APPLICABLE

R-1 Line Item 159

Exhibit R-3, RDT&E PE/Project Cost Breakdown  
(Exhibit R-3, Page 47 of 48)

# UNCLASSIFIED

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FY 1999 RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: FEBRUARY 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N

PROJECT NUMBER: W2124

PROGRAM ELEMENT TITLE: Consolidated Training  
Systems Development

PROJECT TITLE: Air Warfare Training  
Development (AWTD)

	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Subtotal Product Development	4,867	1,305	1,071	635	CONT.	CONT.
Subtotal Support and Management	1,297	31	31	31	CONT.	CONT.
Subtotal Test and Evaluation	0	380	870	1,387	CONT.	CONT.
Total Project	6,164	1,716	1,972	2,053	CONT.	CONT.

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Exhibit R-3, RDT&E PE/Project Cost Breakdown  
(Exhibit R-3, Page 48 of 48)

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## FY 1999 RDT&amp;E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 7            PROGRAM ELEMENT: 0204575N  
PROGRAM ELEMENT TITLE: Electronic Warfare Readiness Support

(U) COST: (in millions)

PROJECT NUMBER & TITLE	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	COST TO COMPLETE CONT.	TOTAL COST CONT.
Z2263 Information Warfare Systems	0	1.2	1.6	3.7	5.0	5.9	5.9	6.1		

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

The Naval Information Warfare Activity is tasked as the Navy's principal technical agent to research, assess, develop and prototype Information Warfare (IW) capabilities. This program will support the development of an effort encompassing all aspects of IW attack, protect and exploit. A key focus of efforts in this line will be providing tactical commanders with an IW Mission Planning, Analysis, and Command and Control Targeting System (IMPACTS) tool. An aggressive program is maintained to acquire and analyze state-of-the-art technologies (software and hardware), evaluate fleet applicability and prototype developmental capabilities.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

FY1997

- (\$300) Migrate offensive IW capabilities to Fleet Information Warfare Command. Develop for use in tactical environments.
- (\$748) Develop Joint Maritime Command Information Strategy (JMCIS) based IMPACTS.
- (\$151) Initiate study to develop system-specific requirements for Naval Deception capabilities.
- (\$41) Portion of extramural program reserved for Small Business Innovation Research Assessment in accordance with 15 USC 638.

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2)

DATE: February 1998

BUDGET ACTIVITY: 7            PROGRAM ELEMENT: 0204575N  
PROGRAM ELEMENT TITLE: Electronic Warfare Readiness Support

FY 1998

(U) (\$276) Continue development of offensive IW capabilities. Add additional counter-C2 capabilities for existing systems.

(U) (\$1,152) Continue developing and updating IMPACTS.

(U) (\$150) Continue with design specifications for Naval Deception capabilities.

FY 1999

(U) (\$1,000) Complete development of second generation attack module.

(U) (\$500) Initiate design of next generation Physiological Operations (PSYOP) system.

(U) (\$500) Initiate design of next generation Tactical Deception (TD) system.

(U) (\$1,716) Continue developing and updating IMPACTS. Migrate current capability to Windows NT operating system platforms. Continue development of JMCIS-complaint IMPACTS C2W tactical decision aids.

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 97</u>	<u>FY 98</u>	<u>FY 99</u>
FY 1998 President's Budget:	1.583	1.626	3.766
Change from Appropriated/Pres Budget:	(.343)	(.048)	(.050)
FY 1999 President's Budget:	1.240	1.578	3.716

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2)

DATE: February 1998

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0204575N  
PROGRAM ELEMENT TITLE: Electronic Warfare Readiness Support

(U) CHANGE SUMMARY EXPLANATION:

Funding: The FY 1997 adjustment is due to SBIR Transfer (-41), Supplemental revised economic assumptions (-2), Below threshold reprogramming action (-300). FY 1998 changes are the result of the 1.5% General Reduction (-24k), R&D General Reduction (-20K), and the Economic Assumptions reduction (-4K). FY 1999 change is the net result of a decrease for the Commercial Purchase Inflation adjustment (-65K) and a NWCF Surcharge correction (+15K).

Schedule: Not applicable

Technical: Not applicable

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

		FY 96	FY 97	FY 98	FY 99	FY 00	FY 01	FY 02	FY 03	TO COMP.	TOTAL COST
MPN	Line 1B1B	11.4	11.3	11.3	11.4	11.8	12.1	12.5	12.8	CONT.	CONT.
OMN	Line 4B7N	1.2	1.2	1.7	1.8	1.9	1.9	2.0	2.0	CONT.	CONT.
OPN	Line 234000/6	1.4	4.7	3.7	4.1	5.2	6.2	6.6	6.7	CONT.	CONT.
RPN	Line 1C1C	.9	.7	.8	.8	.8	.8	.8	.9	CONT.	CONT.

(U) RELATED RDT&E:

PE 0305885G (Defense Cryptologic Program)

D. (U) SCHEDULE PROFILE: Not applicable.

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)

DATE: February 1998

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0204575N  
PROGRAM ELEMENT TITLE: Electronic Warfare Readiness Support

A. (U) PROJECT COST BREAKDOWN: (dollars in thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>
a. Software Development	1,048	1,448	3,601	4,877
b. Miscellaneous	192	130	115	100
TOTAL	1,240	1,578	3,716	4,977

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

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	FY 2000 Budget	To Comp.	Total Program
Product Development						1,240	1,578	3,716	4,977	CONT.	CONT.

Support and Management: Not applicable

Test and Evaluation: Not applicable

GOVERNMENT FURNISHED PROPERTY: Not applicable

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204575N

PROGRAM ELEMENT TITLE: Electronic Warfare Readiness Support

	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	FY 2000 Budget	To Complete	Total Program
SUBTOTAL PRODUCT DEVELOPMENT	0	1,240	1,578	3,716	4,977	CONT.	CONT.
SUBTOTAL SUPPORT AND MANAGEMENT	0	0		0	0	0	0
SUBTOTAL TEST AND EVALUATION	0	0		0	0	0	0
TOTAL PROGRAM	0	1,240	1,578	3,716	4,977	CONT.	CONT.

C. (U) FUNDING PROFILE: Not applicable

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205601N

PROGRAM ELEMENT TITLE: HARM Improvement

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 <u>ACTUAL</u>	FY 1998 <u>ESTIMATE</u>	FY 1999 <u>ESTIMATE</u>	FY 2000 <u>ESTIMATE</u>	FY 2001 <u>ESTIMATE</u>	FY 2002 <u>ESTIMATE</u>	FY 2003 <u>ESTIMATE</u>	TO <u>COMPLETE</u>	TOTAL <u>PROGRAM</u>
W1780 HARM Improvement	2,274	4,926	7,448	11,525	9,627	7,135	1,934	0	47,991
W2185 Advanced Anti-Radiation Guided Missile (AARGM)	32,620	33,962	10,480	11,000	8,000	0	0	0	96,062*
W2211 Joint Advanced Weapons System (JAWS) (Army Lead)	889	1,025	993	0	0	0	0	0	3,838
<b>TOTAL</b>	<b>35,783</b>	<b>39,913</b>	<b>18,921</b>	<b>22,525</b>	<b>17,627</b>	<b>7,135</b>	<b>1,934</b>	<b>0</b>	<b>147,891</b>

\*Funding prior to FY97 for this project is under PE 0603217N

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: W1780/HIGH-SPEED ANTI-RADIATION (HARM) IMPROVEMENT: The HARM Improvement Program consists of a tactical software upgrade (Block V) to the missile. Also, in order to meet Insensitive Munitions (IM) requirements for shipboard compatibility, studies will be conducted regarding the development of a technical data package to verify that a recommended Fast-Cook-Off mitigating material is compatible with the HARM weapons system. The HARM Block VI Upgrade Program is a tri-national HARM Upgrade Program consisting of a tactical software upgrade in conjunction with a hardware upgrade which includes the installation of an Inertial Measurement Unit (IMU) closely coupled with a Global Positioning System (GPS) receiver to provide much improved guidance capability to the current AGM-88B missiles (in German and Italian inventories) and AGM-88C missiles (in U.S. inventory). This IMU/GPS system will be retrofitted into existing missiles as a kit at the depot.

(U) W2185/ ADVANCED ANTI-RADIATION GUIDED MISSILE (AARGM): AARGM is a Phase III Small Business Innovative Research (SBIR) program designed to demonstrate an advanced dual-mode seeker on an existing High speed Anti-Radiation Missile (HARM) airframe.

(U) W2211/JOINT ADVANCED WEAPONS SYSTEM (JAWS): JAWS is a proposed joint service program which will fulfill Army and Marine Corps Mission Needs Statement requirements for the program. The Navy is participating with the Army in joint trade studies and development of Milestone 0 support documentation including an FY 2000 new start decision and joint Analysis of Alternatives (previously Cost and Operational Effectiveness Analysis (COEA)).

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it encompasses engineering and manufacturing development for upgrade of existing, operational systems.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205601N

PROGRAM ELEMENT TITLE: HARM Improvement

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
W1780 HARM Improvement	2,274	4,926	7,448	11,525	9,627	7,135	1,934	0	47,991

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The High-speed Anti-Radiation Missile (HARM) is an ACAT I joint service program with the Air Force (NAVY lead). The program has been in full production since FY 1983 and Program Element 0205601N was used until FY 1990 to develop and test one hardware and two software upgrades to the HARM as Engineering Change Proposals (ECP). Another ECP software program (Block V) is planned that modifies HARM software in order to meet expanding requirements. This joint service upgrade is being developed with Air Force funds under Texas Instrument contract N0001993G0179. The Air Force funds cover all contractor development and contractor Test and Evaluation (T&E) cost. The Navy funds cover all government costs related to development and T&E. The tactical software upgrade will give HARM a Home-On-Jam (HOJ) capability, improved geographic specificity, and improved capability against advanced waveforms. Studies to address corrective actions for documented deficiencies will be conducted. The Block VI HARM Upgrade Program is a tri-national (U.S., Italy, Germany) Program designed to improve the HARM's effectiveness by improving the missile's probability to kill and reducing the potential for fratricide while making the missile easier to employ. The Program consists of significant hardware and software modifications to the missile's control and guidance sections, respectively. The three nations involved agree to jointly fund the design, development, testing and production of hardware kits to be installed in the missile control section along with an improved software version to be installed in the missile guidance section.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205601N

PROJECT NUMBER: W1780

PROGRAM ELEMENT TITLE: HARM Improvement

PROJECT TITLE: HARM Improvement

## 1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$190) Government completed IM studies and continued evaluation of other weapon system upgrades to assess service life, missile performance, deficiencies, and logistics support.
- (U) (\$1,851) Continued government participation in defining Block V software requirements, supporting missile software development, and Electronic Intelligence (ELINT) file changes in support of upgrades to the Tactical Aircraft Mission Planning System (TAMPS). Government began Block V system integration tests and software Independent Verification, & Validation, continued Block V OPTEVFOR/VX9 Development Testing/Operational Testing (DT/OT) test execution development and planning, and completed HOJ/Modulated target development and upgrades. Developed and integrated Block V requirements into the Operational Flight Plan (15C) tape.
- (U) (\$233) Contractor began to perform engineering studies for Block V software development/verification.

## 2. (U) FY 1998 PLAN:

- (U) (\$2,313) Begin execution of the joint services combined DT/OT program at the Naval Air Warfare Center - Weapons Division (NAWC-WD), China Lake. Continue government development of ELINT, TAMPS, and avionics update required for the Block V Upgrade.
- (U) (\$358) Continue weapons system upgrade studies assessing weapon service life, missile performance, deficiencies, and logistics requirements.
- (U) (\$863) Initiate an Engineering and Project Management Services in support of the HARM Upgrade Program (Block VI). Contract will require incremental funding from all three co-development partners (U.S. Navy, Italy, and Germany) from FY98-02.
- (U) (\$225) Initiate Government engineering support including system performance definition, specification requirements and design analysis for the HARM Upgrade Program (Block VI).
- (U) (\$80) Initiate Government test planning, including development of the Test and Evaluation Master Plan and DT/OT test plans for Block VI.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205601N

PROJECT NUMBER: W1780

PROGRAM ELEMENT TITLE: HARM Improvement

PROJECT TITLE: HARM Improvement

- (U) (\$1,087) Initiate Government participation in defining HARM Upgrade Program (Block VI) aircraft integration requirements, including the HARM Mission Planning Module modifications for TAMPS; software requirements for the HARM Command Launch Computer (CLC); as well as the initial development of the interface control documents and support for the F/A-18 Operational Flight Program (OFP).

### 3. (U) FY 1999 PLAN:

- (U) (\$1,842) Complete the NAWCWD China Block V joint service support of the combined DT/OT program. Complete government development of ELINT, TAMPS, and avionics updates required for the Block V Upgrade. Conduct the Functional Configuration Audit/Physical Configuration Audit and development of the Engineering Change Proposal to incorporate the Block V software into the HARM inventory.
- (U) (\$345) Provide HARM Block V system engineering support of development and systems integration efforts. Continue weapon system upgrade studies assessing weapons service life, missile performance, deficiencies, and logistics requirements.
- (U) (\$1,117) Initiate installation by Government personnel of Block V Software in HARM Missiles at field sites.
- (U) (\$700) Continue Engineering and Project Management Services in support of the HARM Upgrade Program (Block VI) contract.
- (U) (\$1,146) Continue Government engineering support of the HARM Upgrade Program (Block VI) including preparation for a Preliminary Design Review; support for the Interface Control Working group in defining interface requirements; supporting contractor subsystem design, analysis and testing; and ELINT development.
- (U) (\$290) Continue Government support of contractor testing including evaluation of test plans, reports, and preparation of detailed test planning documentation.
- (U) (\$300) Continue Government logistic support including finalizing initial logistics support analyses and evaluating contractor designs.
- (U) (\$1,708) Continue Government and contractor participation in developing the aircraft avionics updates required by the HARM Upgrade Program (Block VI) in addition to CLC/TAMPS upgrade efforts.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205601N  
 PROGRAM ELEMENT TITLE: HARM Improvement

PROJECT NUMBER: W1780  
 PROJECT TITLE: HARM Improvement

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	2,293	5,089	7,448
(U) Appropriated Value:	2,395		
(U) Adjustments from PRESBUDG:	-19	-163	0
(U) FY 1999 President's Budget Submit:	2,274	4,926	7,448

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY97 decrease of -\$19 thousand reflects -\$16 thousand SBIR reduction and -\$3 thousand decrease for minor pricing. The FY98 decrease of -\$163 thousand reflects a -\$12 thousand decrease for contractor advisory and assistance services and a -\$151 thousand decrease for various Congressional pricing adjustments.

(U) Schedule: No changes.

(U) Technical: No changes.

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

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>TO</u>	<u>TOTAL</u>
	<u>ACTUAL</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>COMPLETE</u>	<u>PROGRAM</u>
(U) WPN HARM MODS	0	0	0	0	0	0	10,958	38,040	48,998

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205601N  
PROGRAM ELEMENT TITLE: HARM Improvement

PROJECT NUMBER: W1780  
PROJECT TITLE: HARM Improvement

(U) RELATED RDT&E: Not applicable

D. (U) SCHEDULE PROFILE:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>TO COMPLETE</u>
Program Milestones	Block V Integration Test and IV & V (1Q97 - 4Q97)		Block V ECP Incorporation (2Q99 - 3Q99)	
Engineering Milestones			Block V FCA/PCA (1Q99 - 3Q99)	
T&E Milestones		Block V DT/OT (1Q98 - 1Q99)		
Contract		*2Q Block VI EMD Contract Award		

HARM Block VI Upgrade Program Schedule Profile will be provided upon final agreement with all parties (Italy/Germany/U.S.) in conjunction with a signed Memorandum of Agreement (MOA). This is expected in January 1998.

\* Will be funded using funds from the German and Italian governments.

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

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205601N

PROJECT NUMBER: W1780

PROGRAM ELEMENT TITLE: HARM Improvement

PROJECT TITLE: HARM Improvement

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

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Engineering Services	1,321	1,553	4,489
b. Test and Evaluation	520	2,393	1,979
c. Furnished Equipment	243	0	0
d. Management Support	110	900	900
e. Travel	80	80	80
Total	2,274	4,926	7,448

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

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205601N

PROJECT NUMBER: W1780

PROGRAM ELEMENT TITLE: HARM Improvement

PROJECT TITLE: HARM Improvement

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

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1996 and Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development										
NAWC/China Lake	WX	11/98	29,618	29,618	1,242	1,088	1,312	1,146	24,830	29,618
NAWC/Point Mugu	WX	11/98	1,417	1,417	0	0	0	1,417	0	1,417
NAWC/China Lake	WX	6/99	1,708	1,708	0	0	0	1,708	0	1,708
Miscellaneous										
(In-house)	WX	Var	1,217	1,217	45	313	321	298	240	1,217
(Contractor)C/CPFF		1/99	1,300	1,300	1,300	0	0	0	0	1,300
Support and Management										
Miscellaneous	C/CPFF	VAR	4,320	4,320	110	110	900	900	2,300	4,320
Test and Evaluation										
NAWC/China Lake	WX	11/98	7,865	7,865	122	520	2,393	1,979	2,851	7,865

GOVERNMENT FURNISHED PROPERTY

Item Description	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Delivery Date	Total FY 1996 and Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development									
					0	0	0	0	0
Support and Management									
					0	0	0	0	0
Test and Evaluation									
Targets	WX	11/96	11/97	546	303	243	0	0	546

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

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205601N  
PROGRAM ELEMENT TITLE: HARM Improvement

PROJECT NUMBER: W1780  
PROJECT TITLE: HARM Improvement

	<u>Total FY 1996 and Prior</u>	<u>FY 1997 Budget</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Subtotal Production Development	2,587	1,401	1,633	4,569	25,070	35,260
Subtotal Support and Management	110	110	900	900	2,300	4,320
Subtotal Test and Evaluation	425	763	2,393	1,979	2,851	8,411
Total Project	3,122	2,274	4,926	7,448	30,221	47,991

Exhibit R-3

# UNCLASSIFIED

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205601N

PROGRAM ELEMENT TITLE: HARM Improvement

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
W2185 Advanced Anti-Radiation Guided Missile (AARGM)	32,620*	33,962	10,480	11,000	8,000	0	0	0	96,062

\* Funding prior to FY97 for this project is under PE 0603217N

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

The Advanced Anti-Radiation Guided Missile (AARGM) Project is a Phase III Small Business Innovative Research (SBIR) program to develop and demonstrate a dual-mode guidance section on a HARM airframe. The AARGM Pulse III technology demonstration program is designed to demonstrate that a Dual-mode (passive Anti-Radiation Homing (ARH)/active Millimeter Wave (MMW) radar) missile can engage and destroy enemy air defenses in the event that these systems "shut-down", or employ other countermeasures.

The issue of "shut-down" has been a major shortcoming in the suppression of enemy air defenses (SEAD) element of the offensive counter air mission area for the United States Navy and Air Force. Program objectives are to demonstrate an effective and affordable lethal SEAD capability against mobile, relocatable, or fixed air defense threats even in the presence of emitter shutdown or other Anti-Radiation Missile (ARM) countermeasures. The dual-mode technology being developed in the AARGM program has very high potential to solve the problem of "shut-down" not only in the primary weapon for SEAD, the High Speed Anti-Radiation Missile (HARM), but it could be integrated with many other missile airframes.

The AARGM technology demonstration program is an outgrowth of a Phase I and II competitive SBIR program. Phase I and II SBIR efforts successfully demonstrated the feasibility of a dual-mode seeker to address radar "shut-down" issues. Science and Applied Technology (SAT), Inc. (San Diego, CA), was awarded Phase I and II contracts (FY90-93) and was subsequently selected for a Phase III demonstration in FY94. Phase III work is being performed by SAT.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205601N

PROJECT NUMBER: W2185

Missile(AARGM)

PROGRAM ELEMENT TITLE: HARM Improvement

PROJECT TITLE: Advanced Anti-Radiation Guided

## 1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$27,500) Contractor to initiate efforts to fabricate, assemble, and test subsystems for the AARGM Software Evaluation Station (SWES), Captive Flight Test (CFT) Brassboard, and Control Test Vehicles (CTVs). Contractor to initiate fabrication and procurement of the material required for a flight-worthy prototype and eight (8) Guided Test Vehicles (GTVs). Also, Contractor to commence design, fabrication, procurement, assembly and testing of program Special Test Equipment (STE).
- (U) (\$260) Contractor to perform program management and engineering services in support of the AARGM technology demonstration. Provide technical management, engineering support, and coordination of AARGM Program weapons system technology studies.
- (U) (\$100) Government technical management support and coordination of AARGM Program weapons system technology studies.
- (U) (\$620) Applied Physics Laboratory to provide engineering support of systems engineering and Analysis of Alternative (AoA). Laboratory to perform system capabilities assessment under the reactive suppression of enemy air defenses modeling and simulation project.
- (U) (\$4,140) Field activity to evaluate the performance of various modern array processing techniques for deriving RF direction finding, utilizing a conformal array of linear antenna elements. Conduct testing and evaluation to address direction finding (DF) accuracy, effects of polarization, angle of arrival, etc. Investigate calibration requirements for system configuration. Assist contractor in identifying field activity Test and Evaluation (T&E) assets, capabilities, requirements, and costs. Provide engineering expertise with anti-radiation homing and millimeter wave experience.

## 2. (U) FY 1998 PLAN:

- (U) (\$32,200) Contractor to integrate brassboard seekers into the SWES and CFT configurations. Commence CTV integration and test execution, prototype seeker fabrication and assembly, prototype seeker tests, and assemble and test GTVs.
- (U) (\$1,062) Field activity to monitor the engineering activities of the AARGM Advanced Technology demonstration contractor. Conduct engineering assessments of Guidance Section Design. Provide T&E planning and engineering support to include assessment, availability and acquisition of targets, acquisition of DSM-160, and use of Advanced High Speed Anti-Radiation Missile (HARM) facility to support captive flight and live fire test programs. Provide management, technical engineering, and assembly support for the design, modification, and testing of telemetry sections in support of the AARGM CTV and GTV testing. Perform all-up-round and aircraft integration technical engineering, laboratory test support, aircraft integration, Command Launch Computer (CLC) justification, flight clearance and other activity related to AARGM field testing support. Field activity to provide analysis of alternatives based on approved weapons system scenarios to include an assessment of current Suppression of Enemy Air Defense (SEAD) deficiencies and an assessment of potential weapon system alternatives to mitigate identified deficiencies.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205601N  
PROGRAM ELEMENT TITLE: HARM Improvement

PROJECT NUMBER: W2185  
PROJECT TITLE: Advanced Anti-Radiation Guided  
Missile(AARGM)

- (U) (\$500) Contractor to continue to perform program management and engineering services in support of the AARGM technology demonstration program. Provide technical management, engineering support, and coordination of AARGM Program weapons system technology studies.
- (U) (\$200) Continue Government technical management support and coordination of AARGM Program weapons system technology studies.

### 3. (U) FY 1999 PLAN:

- (U) (\$6,000) Contractor to perform field tests of the AARGM brassboard seekers, prototype seeker tests, and GTV test execution.
- (U) (\$3,750) Field activity to provide AARGM system engineering support of development and systems integration efforts. Continue weapon system testing studies to assess weapons technology performance and deficiencies.
- (U) (\$530) Contractor to perform program management and engineering services in support of the AARGM technology demonstration program. Provide technical management support and coordination of AARGM Program weapons system technology studies.
- (U) (\$200) Continue Government technical management, engineering support, and coordination of AARGM Program weapons system technology development program.

Exhibit R-2

UNCLASSIFIED

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205601N  
PROGRAM ELEMENT TITLE: HARM Improvement

PROJECT NUMBER: W2185  
PROJECT TITLE: Advanced Anti-Radiation Guided Missile(AARGM)

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	0	0	0
(U) Appropriated Value:	32,620	33,962	10,480
(U) Adjustments from PRESBUDG:	+32,620	+33,962	+10,480
(U) FY 1999 President's Budget Submit:	32,620	33,962	10,480

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY1999 President's Budget submittal includes the first official budget exhibit for the AARGM program. The FY97 increase of +\$32,620 thousand, the FY98 increase of +\$33,962 thousand, and the FY99 increase of +\$10,480 thousand, are due to recently budgeted funding for the AARGM Advanced Technology program. Previous AARGM funding was issued annually as a Congressional "add" action.

(U) Schedule: Initial submittal. The AARGM program is an Advanced Technology Demonstration Program. It is not a Milestone Program. A list of key actions appears in section D, below.

(U) Technical: Initial submittal.

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

(U) RELATED RDT&E: Not applicable

Exhibit R-2

# UNCLASSIFIED

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205601N  
PROGRAM ELEMENT TITLE: HARM Improvement

PROJECT NUMBER: W2185  
PROJECT TITLE: Advanced Anti-Radiation Guided Missile(AARGM)

## D. (U) SCHEDULE PROFILE:

The AARGM program is an Advanced Technology Program and therefore does not have a standard detailed Milestone Plan. A list of key actions appears below.

AARGM PROGRAM	Present - 1Q02
Software Evaluation Station/Brassboard	
Hardware/Software Development	Present - 1Q00
Subsystems Assembly and Test	4Q98 - 3Q99
Seeker Integration/Test	4Q98 - 3Q99
Chamber Tests	4Q99 - 1Q00
Brassboard Captive Flight Tests (CFTs)	
Unique Design and CFT Preparation	1Q98 - 1Q00
Contractor Managed Testing	1Q00
Captive Flight Testing	2Q00 - 3Q01
Control Test Vehicles (CTVs)	
Unique Hardware/Software Development	Present - 4Q99
Subsystems Assembly and Test	3Q98 - 3Q99
Integration and Test	1Q99 - 2Q00
CTV Flights Test and Analysis	2Q00
Prototype	
Hardware/Software Design Upgrades	2Q98 - 1Q00
Subsystems Assembly and Test	4Q98 - 1Q99
Integration and Testing	2Q00 - 3Q00
Captive Carry Test	4Q00
Guided Test Vehicles (GTVs)	
Hardware/Software Design Upgrades	2Q98 - 2Q01
Subsystems Assembly and Test	4Q98 - 3Q01
Integration and Test	1Q01 - 4Q01
GTV Live Fire Test and Analysis	1Q02

Exhibit R-2

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

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205601N

PROJECT NUMBER: W2185

PROGRAM ELEMENT TITLE: HARM Improvement

PROJECT TITLE: Advanced Anti-Radiation Guided Missile(AARGM)

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

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Engineering Services	32,310	31,362	100
b. Test and Evaluation	0	2,000	9,750
c. Furnished Equipment	0	0	0
d. Management Support	260	500	530
e. Travel	50	100	100
Total	32,620	33,962	10,480

Exhibit R-3

**UNCLASSIFIED**

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

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205601N  
PROGRAM ELEMENT TITLE: HARM Improvement

PROJECT NUMBER: W2185  
PROJECT TITLE: Advanced Anti-Radiation Guided Missile(AARGM)

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

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1996 and Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development										
NAWC/China Lake	WX	10/98	5,202	5,202	0	4,140	1,062	0	0	5,202
SAT Contract - Phase III	SBIR/CPFF	6/99	57,700	57,700	0	27,500	30,200	0	0	57,700
Miscellaneous										
(In-house)	WX Var	10/98	900	900	0	100	200	200	400	900
(Contractor)	JHU/APL	CPFF	2/98	620	620	0	620	0	0	620
Support and Management										
Miscellaneous	VAR	1/99	2,370	2,370	0	260	500	530	1,080	2,370
Test and Evaluation										
NAWC/China Lake	WX	10/98	10,870	10,870	0	0	2,000	3,750	5,120	10,870
SAT Contract - Phase III	SBIR/CPFF	6/99	18,400	18,400	0	0	0	6,000	12,400	18,400

GOVERNMENT FURNISHED PROPERTY

Item Description	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Delivery Date	Total FY 1996 and Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development				0	0	0	0	0	0
Support and Management				0	0	0	0	0	0
Test and Evaluation				0	0	0	0	0	0

Exhibit R-3

**UNCLASSIFIED**

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

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205601N  
PROGRAM ELEMENT TITLE: HARM Improvement

PROJECT NUMBER: W2185  
PROJECT TITLE: Advanced Anti-Radiation Guided Missile(AARGM)

	<u>Total FY 1996 and Prior</u>	<u>FY 1997 Budget</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Subtotal Production Development	0	32,360	31,462	200	400	64,422
Subtotal Support and Management	0	260	500	530	1,080	2,370
Subtotal Test and Evaluation	0	0	2,000	9,750	17,520	29,270
Total Project	0	32,620	33,962	10,480	19,000	96,062

\* Funding prior to FY97 for this project is under PE 0603217N

Exhibit R-3

**UNCLASSIFIED**

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

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205601N

PROGRAM ELEMENT TITLE: HARM Improvement

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
W2211 Joint Advanced Weapons Systems (JAWS)	889	1,025	993	0	0	0	0	0	3,838

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Joint Attack Weapon System (JAWS) is a proposed joint service program which will fulfill Army and Marine Corps Mission Needs Statement requirements for the post-2000 force structure. The Army (the TOW/HELLFIRE lead service) is proposed as the lead service for the program. To support an FY 2000 new start decision, the Navy is participating with the Army in joint trade studies and development of Milestone 0 support documentation, including a joint Analysis of Alternatives (previously Cost and Operational Effectiveness Analysis (COEA)). The initial basis for trade studies is improvements to the Army HELLFIRE, including alternative seekers and rocket motor improvements. Proposed TOW follow-on are being evaluated including The Army Combined Arms Weapon System (TACAWS) and Advanced Missile System - Heavy (AMS-H). The Navy is participating in the Army's Battlefield Environment Weapon System Simulation (BEWSS) Test Bed evaluation of the Army's Future Missile Technology Integration (FMTI) advanced developments in guidance, propulsion and warheads. Application of these developments are being assessed simultaneously with the Navy's dual mode seeker technologies in the Advanced Anti-Radiation Guided Missile (AARGM) program. The JAWS Mission Needs Statement requires a state of the art technology solution which counters air and surface threats in the post-2000 battlefield.

Exhibit R-2

# UNCLASSIFIED

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205601N

PROJECT NUMBER: W2211

PROGRAM ELEMENT TITLE: HARM Improvement

PROJECT NAME: Joint Advanced Weapons Systems (JAWS)

## (U) PROGRAM ACCOMPLISHMENTS AND PLANS:

### 1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$889) Supported joint trade study and BEWSS evaluation, develop HELLFIRE seeker and demonstration plan, improvement options, continued pre-Milestone 0 documentation, participated in structuring acquisition program and procurement documentation with Army acquisition lead. (\$586K Army and \$303K Government In-House)

### 2. (U) FY 1998 PLAN:

- (U) (\$1,025) Continue BEWSS evaluation through introduction of fixed wing, Advanced Short Takeoff and Landing (ASTOL), and lethal/non-lethal mission requirements, continue structuring Milestone 0 acquisition program start for FY 2000 decision. Conduct mission effectiveness simulations assessments, continue selection of technology candidates, including advanced guided rockets/Hellfire upgrades, to fulfill multi-mission requirements. (\$400K Army and \$625K Government In-House)

### 3. (U) FY 1999 PLAN:

- (U) (\$993) Complete BEWSS evaluation of fixed wing, ASTOL, lethal/non-lethal missions requirements, complete Milestone 0 documentation, complete mission effectiveness assessments, select mission technologies, transition to Pre-Planned Product Improvement or new start program. (\$420K Army and \$573K Government In-House)

Exhibit R-2

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205601N

PROJECT NUMBER: W2211

PROGRAM ELEMENT TITLE: HARM Improvement

PROJECT NAME: Joint Advanced Weapons Systems (JAWS)

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget Submit:	914	1,080	988
(U) Appropriated Value:	953		
(U) Adjustment from PRESBUDG Submit:	-25	-55	+5
(U) FY 1999 President's Budget SUBMIT:	889	1,025	993

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY97 decrease of -\$25 thousand reflects a -\$24 thousand adjustment for Small Business Innovation Research and -\$1 thousand decrease for minor pricing adjustments. The FY98 decrease of -\$55 thousand reflects a -\$24 thousand decrease for contractor advisory and assistance services and a -\$31 thousand decrease for minor pricing adjustments. The FY99 net increase of \$5 thousand reflects minor pricing adjustments.

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

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

(U) RELATED RDT&E: US Army P.E. 0603313A PROJ D263 Future Missile Technology Insertion (FMTI).

D. (U) SCHEDULE PROFILE: Not applicable.

Exhibit R-2

# UNCLASSIFIED

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205604N

PROGRAM ELEMENT TITLE: Tactical Data Links

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
P1743 LINK-16 Improvements	0	2,519	4,432	4,259	4,273	9,809	8,684	CONT	CONT
P1753 LINK-11 Improvements	1,352	0	0	0	0	0	0	0	0
P1977 Navy JTIDS	5,550	0	0	0	0	0	0	0	551,790
P2126 ATDLS Integration	27,793	37,415	45,325	31,445	22,978	17,515	19,042	CONT	CONT
TOTAL	34,695	39,934	49,757	35,704	27,251	27,324	27,726	CONT	CONT

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This program element (PE) develops and improves the Navy's tactical data link system. It includes the LINK-16 Improvements program, the LINK-11 Improvements program, the Joint Tactical Information Distribution System (JTIDS), and the Advanced Tactical Data Link Systems (ATDLS) Integration.

(U) The LINK-16 will provide translation between Tactical Digital Information Links (TADILs) and will isolate all tactical data link equipment, message standards and protocols from tactical information processors. This will provide a flexible capability for rapidly exchanging tactical information using a single data base for translating various link formats while remaining completely independent of communications equipment and tactical data computing systems. LINK-16 will also improve existing computer-to-computer digital radio communications in the HF and UHF radio frequency bands among Combat Direction System (CDS) equipped ships, submarines, aircraft and shore sites. Data link improvements will allow more effective employment of fleet units by increasing the timeliness, accuracy, and content of tactical data transfer. In order to ensure interoperability, the U.S. is the Lead Technical Nation for LINK-22 to the NATO Improved Link Eleven (NILE) Office.

R -1 Line Item 162

Budget Item Justification  
(Exhibit R-2 , Page 1 of 26 Pages)

# UNCLASSIFIED

# UNCLASSIFIED

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205604N

PROGRAM ELEMENT TITLE: Tactical Data Links

(U) The ATDLS Integration program will integrate the Multifunctional Information Distribution System-Low Volume Terminal (MIDS-LVT) LINK-16 terminal into U.S. Navy platforms. Other Navy platforms will be added with the adaptation of MIDS to shipboard. MIDS-LVT is a multinational cooperative development program that will provide space constrained tactical fighter aircraft with LINK-16 capability through the development of a terminal (MIDS-Low Volume Terminal (LVT)) that is functionally identical to the JTIDS Class 2 terminal, but, through the use of Very High Speed Integrated Circuit (VHSIC) and Microwave Monolithic Integrated Circuits (MMIC) technology, is one-half the weight and one-third the size of the JTIDS terminal. This project funds the costs to integrate and test MIDS on the F/A-18 and other Navy platforms. The multinational cooperative development of the MIDS terminal is funded in PE 0604771D. ATDLS Integration of MIDS-LVT will also provide selected U.S. Navy tactical aircraft, U.S. Navy ships, and U.S. Marine Corps ground units with crypto-secure, jam resistant, low-probability-of-exploitation communication of tactical data and voice at a high data rate. It will have additional capabilities of common grid navigation and automatic relay inherent in the equipment that will enable long range communication and provide jam resistance. The system will be interoperable among all Services and NATO/Allied users equipped with MIDS-LVT, JTIDS Class II/IIA or NATO MIDS.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it encompasses engineering and manufacturing development for upgrade of existing, operational systems.

(U) Change in Program: P1743 Command and Control Processor (C2P) has been renamed LINK-16 Improvements. FY 1995 and FY 1996 accomplishments and FY 1997 plan are efforts under the C2P name. FY 1998 and FY 1999 plan is rolled up from the LINK-11 Improvement Program into the new LINK-16 Improvements program. The Multifunctional Information Distribution System (MIDS) has been renamed ATDLS Integration.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205604N

PROJECT NUMBER: P1743

PROGRAM ELEMENT TITLE: Tactical Data Links

PROJECT TITLE: Link-16

Improvements

(U) COST (Dollars in Thousands)

PROJECT

NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
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P1743 LINK-16 Improvements

	0	2,519	4,432	4,259	4,273	9,809	8,684	CONT	CONT
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A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The LINK-16 Improvements program develops improvements and new capabilities to Navy TADIL-J users. The Command & Control Processor (C2P) is a software development effort that provides an interface between the Tactical Digital Information Links (TADILs) (LINK 4A, 11 and 16) and major surface ship Command and Control systems (Advanced Combat Direction Systems (ACDS) and AEGIS C&D). Common Data Link Management System (CDLMS) is designated as a Pre-planned Product Improvement (P3I) of the C2P. The CDLMS will provide translation between TADILs and isolate all tactical data link equipment, message standards and protocols from tactical information processors. This will provide a flexible capability for rapidly exchanging tactical information using a single data base for translating various link formats while remaining completely independent of communications equipment and tactical data computing systems. The program includes the LINK-22 program and near term improvements to sustain existing LINK-11 systems. Near term LINK-11 improvements include: Mobile Universal Link Translator System (MULTS) upgrade, Common Shipboard Data Terminal Set (CSDTS), and Link-11 Baseline Freeze message standard work. The LINK-22 program will improve the performance of both LINK-11 and LINK-16 through the combination of the results of the Critical Systems Demonstration (CSD) project and the NATO Improved LINK-11 (NILE) project, now known as LINK-22. LINK-22 will pass TADIL-J data elements beyond the line of sight (HF) using a Time Division Multiple Access (TDMA) protocol and the improved LINK-11 waveform. These projects will allow more effective employment of fleet units by increasing timeliness, accuracy, and content of tactical data transfer.

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

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205604N

PROJECT NUMBER: P1743

PROGRAM ELEMENT TITLE: Tactical Data Links

PROJECT TITLE: LINK-16 Improvements

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) Not applicable.

2. (U) FY 1998 PLAN:

- (U) (\$1,292) Continue efforts of design and development Subphase 2 for the NILE Reference System (NRS).  
(Began in LINK-11 Improvement; Project 1753)
- (U) (\$1,227) Continue preparing for U.S. implementation of LINK-22 including CDLMS/CSDTS upgrades.  
(Began in LINK-11 Improvement; Project 1753)

3. (U) FY 1999 PLAN:

- (U) (\$1,136) Continue efforts of design and development Subphase 2 for the NILE Reference System.
- (U) (\$3,296) Begin development of U.S. implementation of LINK-22 including CDLMS/CSDTS upgrades.

R -1 Line Item 162

Budget Item Justification  
(Exhibit R-2 , Page 4 of 26 Pages)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205604N

PROJECT NUMBER: P1743

PROGRAM ELEMENT TITLE: Tactical Data Links

PROJECT TITLE: LINK-16 Improvements

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	106	2,596	4,534
(U) Appropriated Value:			
(U) Adjustments from FY 1998 President's Budget:	-106	-77	-102
(U) FY 1999 President's Budget Submit:	0	2,519	4,432

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding:

FY 1997: \$-2K for NWCF Surcharge, \$-2K for other Navy adjustments and \$-102K reflects programatic adjustments.

FY 1998: Congressional Undistributed General Reductions are \$-71K and Revised Economic Assumptions are \$-6K.

FY 1999: NWCF adjustments were \$-33K and Other Navy Adjustments were \$-69K.

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

# UNCLASSIFIED

# UNCLASSIFIED

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205604N

PROJECT NUMBER: P1743

PROGRAM ELEMENT TITLE: Tactical Data Links

PROJECT TITLE: LINK-16 Improvements

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

NUMBER TITLE	FY 1997 <u>ACTUAL</u>	FY 1998 <u>ESTIMATE</u>	FY 1999 <u>ESTIMATE</u>	FY 2000 <u>ESTIMATE</u>	FY 2001 <u>ESTIMATE</u>	FY 2002 <u>ESTIMATE</u>	FY 2003 <u>ESTIMATE</u>	TO <u>COMPLETE</u>	TOTAL <u>PROGRAM</u>
(U) OPN Line 02614 ATDLS	16,257	15,051	33,021	26,727	25,779	30,300	34,742	CONT	CONT

(U) RELATED RDT&E: Not applicable.

D. (U) SCHEDULE PROFILE:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>TO COMPLETE</u>
Program Milestones				
Engineering Milestones				
T&E Milestones			NRS Test 3Q/99	Link-22 DT/OT 3Q/01
Contract Milestones				

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

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205604N

PROJECT NUMBER: P1743

PROGRAM ELEMENT TITLE: Tactical Data Links

PROJECT TITLE: LINK-16 Improvements

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

PROJECT COST CATEGORIES	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. NATO Improved Link Eleven	0	1,292	1,136
b. LINK-22	0	1,227	3,296
TOTAL	0	2,519	4,432

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Budget Item Justification  
(Exhibit R-3, Page 7 of 26 Pages)

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

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205604N

PROJECT NUMBER: P1743

PROGRAM ELEMENT TITLE: Tactical Data Links

PROJECT TITLE: LINK-16 Improvements

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

PERFORMING ORGANIZATIONS

<u>Contractor/ Government Performing Activity</u>	<u>Contract Method/Type or Funding Vehicle</u>	<u>Award or Oblig Date</u>	<u>Performing Activity EAC</u>	<u>Project Office EAC</u>	<u>Total FY 1996 &amp; Prior</u>	<u>FY 1997 Budget</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Product Development										
Misc Labs and Contracts	Various	Various	63,809	63,809	63,809	0	0	0	63,809	63,809
Misc Contracts	Various	Various	N/A	N/A	0	0	442	887	CONT	CONT
Misc Labs	Various	Various	N/A	N/A	0	0	1,951	3,324	CONT	CONT
Support and Management										
Miscellaneous	Various	Various	18,443	18,433	18,433	0	126	221	CONT	CONT
Test and Evaluation										
Miscellaneous	Various	Various	11,354	11,354	11,354	0	0	0	0	11,354

GOVERNMENT FURNISHED PROPERTY: Not applicable.

# UNCLASSIFIED

# UNCLASSIFIED

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

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205604N

PROJECT NUMBER: P1743

PROGRAM ELEMENT TITLE: Tactical Data Links

PROJECT TITLE: LINK-16 Improvements

	<u>Total</u> <u>FY 1996</u> <u>&amp; Prior</u>	<u>FY 1997</u> <u>Budget</u>	<u>FY 1998</u> <u>Budget</u>	<u>FY 1999</u> <u>Budget</u>	<u>To</u> <u>Complete</u>	<u>Total</u> <u>Program</u>
Subtotal Product Development	63,809	0	2,393	4,211	CONT	CONT
Subtotal Support and Management	18,433	0	126	221	CONT	CONT
Subtotal Test and Evaluation	11,354	0	0	0	0	11,354
Total Project	93,596	0	2,519	4,432	CONT	CONT

R -1 Line Item 162

Budget Item Justification  
(Exhibit R-3, Page 9 of 26 Pages)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205604N

PROJECT NUMBER: P1753

PROGRAM ELEMENT TITLE: Tactical Data Links

PROJECT TITLE: LINK-11 Improvements

(U) COST (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
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P1753 LINK-11 Improvements	1,352	0	0	0	0	0	0	0	0
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A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: LINK-11 Improvement Program (LEIP) improves existing computer-to-computer radio communications in the High Frequency and Ultra-High Frequency radio and shore sites. The program includes near term improvements to existing LINK-11 systems (LINK-11 Display System (LEDS), Mobile Universal Link Translator System (MULTS), Common Shipboard Data Terminal Set (CSDTS), and LINK-11 Baseline Freeze message standard work) and a LINK-22 program, to improve the performance of LINK-11, which is a combination of the results of the Critical Systems Demonstration (CSD) project and the NATO Improved Link Eleven (NILE) project. These projects will allow more effective employment of fleet units by increasing timeliness, accuracy, and content of tactical data transfer. In order to insure interoperability and to upgrade LINK-11 to LINK 22, the U.S. is the lead technical nation to the NILE office. The NILE development will occur in two Design and Development subphases. Subphase 1 will validate specifications, using simulation, emulation and modeling, and a testbed developed in this subphase. Subphase 2 involves the acquisition, integration and testing of the NILE Reference System (NRS). The U.S. NILE Companion Program (USNCP) will implement LINK-22 in the USN.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET    DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205604N

PROJECT NUMBER: P1753

PROGRAM ELEMENT TITLE: Tactical Data Links

PROJECT TITLE: LINK-11 Improvements

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$435) Began efforts of subphase 2 for the NILE Reference System.
- (U) (\$917) Continued preparing for U.S. implementation of LINK-22.

Both efforts continue in P1743 starting from FY 98.

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

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205604N

PROJECT NUMBER: P1753

PROGRAM ELEMENT TITLE: Tactical Data Links

PROJECT TITLE: LINK-11 Improvements

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	
(U) FY 1998 President's Budget:		2,308	0	0
(U) Appropriated Value:				
(U) Adjustments from FY 1998 President's Budget:	-956	0	0	
(U) FY 1999 President's Budget Submit:	1,352	0	0	

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding:

FY 1997: Programatic adjustments were \$-844K, Revised Economic Assumptions were \$-3K, SBIR adjustment was \$-15K, NWCf adjustments were \$-46K and other Navy adjustments were \$-48K.

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

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

<u>NUMBER</u> <u>TITLE</u>	<u>FY 1997</u> <u>ACTUAL</u>	<u>FY 1998</u> <u>ESTIMATE</u>	<u>FY 1999</u> <u>ESTIMATE</u>	<u>FY 2000</u> <u>ESTIMATE</u>	<u>FY 2001</u> <u>ESTIMATE</u>	<u>TO</u> <u>COMPLETE</u>	<u>TOTAL</u> <u>PROGRAM</u>
OPN Line 2660 HF Link-11 Data Terminals	2,429	0	0	0	0	0	0

(U) RELATED RDT&E: Not applicable.

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Budget Item Justification  
(Exhibit R-2, Page 12 of 26 Pages)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205604N

PROJECT NUMBER: P1753

PROGRAM ELEMENT TITLE: TACTICAL DATA LINKS

PROJECT TITLE: LINK-11 Improvements

D. (U) SCHEDULE PROFILE:

	<u>FY 1997</u>	<u>TO COMPLETE</u>
Program Milestones		
Engineering Milestones		
T&E Milestones		
Contract Milestones	NRS Contract Award 3Q/97	

R -1 Line Item 162

Budget Item Justification  
(Exhibit R-2, Page 13 of 26 Pages)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0205604N  
PROGRAM ELEMENT TITLE: TACTICAL DATA LINKS

PROJECT NUMBER: P1977  
PROJECT TITLE: Navy JTIDS

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
P1977 Joint Tactical Information Distribution System	5,550	0	0	0	0	0	551,790

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: Combat experience gained during the Southeast Asia conflict, Middle East incidents, Grenada, and Desert Storm exposed several deficiencies in U.S. tactical communication, navigation, and identification systems. Extensive analyses of these combat situations indicate that a joint service, high capacity, secure and jam resistant communication and data link would increase force effectiveness and substantially reduce losses due to hostile action and friend-on-friend engagements. These capabilities are critical in the high speed, long range, and electronically hostile environment envisioned in any substantial modern-day conflict. This includes any engagement with minor or third world powers due to the proliferation of high-technology weaponry.

(U) The Time Division Multiple Access (TDMA) family of Joint Tactical Information Distribution System (JTIDS) terminals and the Tactical Digital Information Link J (TADIL J) Message Standard databases resident in C2P are sub-systems integrated into the LINK-16 system. It will provide selected U.S. Navy tactical air, U.S. Navy ships and U.S. Marine Corps ground units crypto-secure, jam resistant, low-probability-of-exploitation communication of tactical data and voice at a high data rate. It will have the additional capabilities of common-grid navigation and the use of automatic relay inherent in the equipment that will enable long-range communication and provide jam resistance. The system will be interoperable among all Services and NATO/Allied users equipped with JTIDS or the European version, NATO MIDS (Germany, Italy, France, and Spain). This project will fund: (1) the costs to integrate and test JTIDS in the E-2C, F-14D, CV, CG, and DDG; (2) the development required to accommodate expanded LINK-16 operational capabilities for additional warfare areas; and (3) the development of automated network management aids.

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

DATE: February 1998

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0205604N  
PROGRAM ELEMENT TITLE: TACTICAL DATA LINKS

PROJECT NUMBER: P1977  
PROJECT TITLE: Navy JTIDS

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$558) Continued joint certification implementation and testing.
- (U) (\$2,060) Conducted LINK-16 ACDS BLK 1 and AEGIS Model 5 testing.
- (U) (\$613) Continued Tadil J Network implementation.
- (U) (\$1,646) Completed FOT&E.
- (U) (\$673) Continued implementation of OPSPEC chg 4.

NOTE: Continuing LINK-16 implementation will be funded in P2126 (ATDLS Integration) commencing in FY 1997.

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Budget Item Justification  
(Exhibit R-2, Page 15 of 26 Pages)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0205604N  
PROGRAM ELEMENT TITLE: TACTICAL DATA LINKS

PROJECT NUMBER: P1977  
PROJECT TITLE: Navy JTIDS

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	6,104	0	0
(U) Appropriated Value:			
(U) Adjustments from FY 1998 President's Budget	-554	0	0
(U) FY 1999 President's Budget Submit:	5,550	0	0

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding:

FY 1997: Programatic adjustments were \$-179K, SBIR adjustments were \$-42K, NWCF adjustments were \$-122K, Revised Economic Assumptions were \$-7K, and other Navy adjustments totaled \$-204K.

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0205604N  
PROGRAM ELEMENT TITLE: Tactical Data Links

PROJECT NUMBER: P1977  
PROJECT TITLE: NAVY JTIDS

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

NUMBER TITLE	FY 1997 <u>ACTUAL</u>	FY 1998 <u>ESTIMATE</u>	FY 1999 <u>ESTIMATE</u>	FY 2000 <u>ESTIMATE</u>	FY 2001 <u>ESTIMATE</u>	TO <u>COMPLETE</u>	TOTAL <u>PROGRAM</u>
BA-1 APN #052500	4,088					CONT	CONT
BA-5 APN #054400	1,488					CONT	CONT
OPN Line 02614 ATDLS	16,257					CONT	CONT
SCN	8,032					CONT	CONT

Other Program Funding continues from FY 1998 in P2126.

(U) RELATED RDT&E:

- (U) PE (0205667N) - F-14 Upgrade. Aircraft upgrades include integration with JTIDS.
- (U) PE (0204152N) - E-2C Improvements. Aircraft upgrades include integration with JTIDS.
- (U) PE (0604771D) - Common JTIDS. Funding develops and procures the Navy's Engineering and Manufacturing Development terminals through the Joint Program Office.

D. (U) SCHEDULE PROFILE:

	<u>FY 1997</u>	<u>TO COMPLETE</u>
Program Milestones		
Engineering Milestones		
T&E Milestones	OT-IIIIB 3/97	
Contract Milestones		

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205604N

PROJECT NUMBER: P2126

PROGRAM ELEMENT TITLE: Tactical Data Links

PROJECT TITLE: ATDLS Integration

(U) COST (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
P2126 ATDLS Integration	27,793	37,415	45,325	31,445	22,978	17,515	19,042	CONT	CONT

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The ATDLS Integration program will integrate the Multifunctional Information Distribution System-Low Volume Terminal (MIDS-LVT) LINK-16 terminal into U.S. Navy platforms. Other Navy platforms will be added with the adaptation of MIDS to shipboard. MIDS-LVT is a multinational (U.S., France, Germany, Italy, and Spain) cooperative development program established to design, develop, and deliver low-volume (LV) (smaller size, same capability), lightweight tactical information system terminals for U.S. fighter aircraft, as well as foreign fighter aircraft, helicopters, ships and ground sites. The terminals will be designed as a Pre-Planned Product Improvement (P<sup>3</sup>I) of the Joint Tactical Information Distribution System (JTIDS) Time Division Multiple Access (TDMA) Class 2 terminal. The goal of the MIDS-LVT program is to produce a terminal that is smaller, lighter, fully compatible with, and as capable as the JTIDS TDMA Class 2 terminals, but suitable for use in platforms that cannot accommodate the bulkier, heavier JTIDS TDMA Class 2 equipment. Additional terminal development costs are funded in program element 0604771D. MIDS-LVT is interoperable among all Services and NATO/Allied users equipped with JTIDS or the European NATO MIDS version. This project funds: (1) the costs to integrate and test MIDS-LVT into Navy air and ship platforms and into shore command centers; (2) the development required to accommodate expanded LINK-16 operational capabilities for additional warfare areas; and (3) development of automated network management aids.

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

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205604N

PROJECT NUMBER: P2126

PROGRAM ELEMENT TITLE: Tactical Data Links

PROJECT TITLE: ATDLS Integration

## (U) PROGRAM ACCOMPLISHMENTS AND PLANS:

### 1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$23,221) Continued F/A-18 MIDS integration software and aircraft design modifications and testing.
- (U) (\$2,047) Continued TADIL-J (CDLMS and Satlink 16) implementation.
- (U) (\$2,525) Continued MIDS-LVT shipboard implementation.

### 2. (U) FY 1998 PLAN:

- (U) (\$31,839) Continue F/A-18 MIDS integration software and aircraft design modifications and testing.
- (U) (\$1,000) Continue TADIL-J (CDLMS and Satlink 16) implementation.
- (U) (\$4,576) Continue MIDS-LVT shipboard implementation.

### 3. (U) FY 1999 PLAN:

- (U) (\$34,622) Continue F/A-18 MIDS integration software and aircraft design modifications and testing.
- (U) (\$5,045) Continue TADIL-J (CDLMS and SATLINK 16) implementation.
- (U) (\$1,100) Complete MIDS-LVT Shipboard Implementation.
- (U) (\$4,558) Begin OPSPEC 5516.3 Upgrades (Performance Upgrades).

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205604N

PROJECT NUMBER: P2126

PROGRAM ELEMENT TITLE: Tactical Data Links

PROJECT TITLE: ATDLS Integration

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	28,784	38,779	40,907
(U) Appropriated Value:			
(U) Adjustments from FY 1998 President's Budget:	-991	-1,364	4,418
(U) FY 1999 President's Budget Submit:	27,793	37,415	45,325

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding:

FY 1997: Programatic increases for F/A-18 MIDS integration \$+931K, Revised Economic Assumptions were \$-34K, SBIR transfer was \$-558K, NWCF surcharge pricing adjustments were \$-575K, and \$-755K in Undistributed Congressional Reductions.

FY 1998: Revised Economic Assumptions are \$-86K and Congressional Undistributed General Adjustments \$-1,278K.

FY 1999: NWCF adjustments are \$+76K, Commercial Purchases Inflation adjustments \$-799, Navy/OSD offsets to finance higher priority programs \$-759K. Funding realignment for MIDS F/A-18 Integration \$+8,900K, and SHF reduction of \$-3,000K for IT-21.

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

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# UNCLASSIFIED

## FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205604N

PROJECT NUMBER: P2126

PROGRAM ELEMENT TITLE: Tactical Data Links

PROJECT TITLE: ATDLS Integration

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

NUMBER TITLE	FY 1997 <u>ACTUAL</u>	FY 1998 <u>ESTIMATE</u>	FY 1999 <u>ESTIMATE</u>	FY 2000 <u>ESTIMATE</u>	FY 2001 <u>ESTIMATE</u>	FY 2002 <u>ESTIMATE</u>	FY 2003 <u>ESTIMATE</u>	TO <u>COMPLETE</u>	TOTAL <u>PROGRAM</u>
(U) APN LINE									
(U) # 052500	0	0	32,944	69,909	64,660	56,633	53,650	185,900	463,696
(U) # 054400	1,931	821	760	772	780	803	818	CONT	CONT
(U) RDT&E DA	37,035	52,238	28,192	12,620	12,880	13,156	13,485	CONT	CONT
(U) OPN LINE 02614 ATDLS	16,257	15,051	33,021	26,727	25,779	30,300	34,742	CONT	CONT
SCN	8,032	7,738	9,400	10,700	8,700	11,500	6,400	CONT	CONT

### (U) RELATED RDT&E:

- (U) PE (0205604N) - JTIDS: Funds integration and test costs for JTIDS on the following Navy Platforms:  
E-2C, F-14D, CV, CG/CGN, and DDG.
- (U) PE (0604771D P773) - JTIDS: Link 16 systems engineering support to OSD.
- (U) PE (0604771D P771) - MIDS: MIDS-LVT terminal development.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205604N

PROJECT NUMBER: P2126

PROGRAM ELEMENT TITLE: Tactical Data Links

PROJECT TITLE: ATDLS Integration

D. (U) SCHEDULE PROFILE:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>TO COMPLETE</u>
Program Milestones			DAB III 1Q/99 (LRIP)	IOC 2Q/01 Ship IOC 2Q/02 Air
Engineering Milestones				
T&E Milestones		OT-IIID2 2/98 DT-IIIC2 6/98 DT-IIA-4 4Q/98	F/A-18 OT-IIA-3 4Q/99 OT-IIA-2 2Q/99 DT-IIA-3 2Q/99 DT-IIA-5 4Q/99	
Contract Milestones			Ship DT/OT-IIB-1 2Q/99 Ship DT/OT-IIB-2 3Q/99	F/A-18 TECHEVAL 1Q/01 F/A-18 OPEVAL 4Q/01 Ship/Sub FOT&E 3Q/00 F/A-18 FOT&E 3Q/02 PLATFORM DT/OT 02/03

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

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205604N

PROJECT NUMBER: P2126

PROGRAM ELEMENT TITLE: Tactical Data Links

PROJECT TITLE: ATDLS Integration

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

PROJECT COST CATEGORIES	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Systems Engineering	3,425	3,096	2,641
b. Integration	21,343	25,457	28,646
c. Test and Evaluation	3,025	8,862	9,480
d. OPSPEC 5516.3	0	0	4,558
TOTAL	27,793	37,415	45,325

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

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205604N

PROJECT NUMBER: P2126

PROGRAM ELEMENT TITLE: Tactical Data Links

PROJECT TITLE: ATDLS Integration

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

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Type or Funding Vehicle	Award or Oblig Date	Performing Activity EAC	Project Office EAC	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development										
Boeing	SS/CPIF	Nov 95	56,589	56,589	22,230	8,769	11,200	11,000	3,390	56,589
NAVAIRWARCENWPNDIV/ China Lake, CA	WX	Various	37,981	37,981	16,431	4,000	7,940	7,650	1,960	37,981
GEC Marconi Electronic Systems Corp, Wayne, NJ N0003996C0094	SS/CPFF	Nov 95	9,018	9,018	1,118	3,000	3,200	1,700	0	9,018
NCCOSC R&D Div Det/ Warminster, PA	WX	Various	6,835	6,835	6,835	0	0	0	0	6,835
NCCOSC R&D Div/ San Diego, CA	WX	Various	49,374	49,374	7,070	2,867	5,886	9,518	CONT	CONT
Misc Contracts and Labs	Various	Various	50,909	50,909	24,344	4,108	2,605	3,173	CONT	CONT

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Budget Item Justification  
(Exhibit R-3, Page 24 of 26 Pages)

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

DATE: February 1998

BUDGET ACTIVITY: 7                      PROGRAM ELEMENT: 0205604N                      PROJECT NUMBER: P2126  
 PROGRAM ELEMENT TITLE: Tactical Data Links                      PROJECT TITLE: ATDLS Integration

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

Contractor/ Government Method/Type Performing or Funding Activity                      Vehicle	Award or Oblig                      Date	Performing Activity                      EAC	Project Office                      EAC	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Support and Management Miscellaneous                      Various	Various	17,453	17,453	10,256	647	1,089	1,304	CONT	CONT
Test and Evaluation NAVAIRWARCENAIRDIV/ Patuxent River, MD                      WX	Various	20,390	20,390	3,140	1,700	2,700	5,827	7,023	20,390
NCCOSC R&D Div/ San Diego, CA                      WX	Various	N/A	N/A	344	2,702	2,795	3,653	CONT	CONT

GOVERNMENT FURNISHED PROPERTY:

Contract Method/Type or Funding Vehicle	Award or Oblig                      Date	Delivery Date	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development Support and Management	Not applicable Not applicable							
Test and Evaluation MIDSCO INC                      SS/CPAF/IF Fairfield, NJ	Jan 96	Jan 98	6,594	0	0	0	0	6,594
MIDSCO INC                      SS/CPAF/IF Fairfield, NJ	Nov 97		0	0	0	1,500	0	1,500

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

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205604N

PROJECT NUMBER: P2126

PROGRAM ELEMENT TITLE: Tactical Data Links

PROJECT TITLE: ATDLS Integration

	<u>FY 1996 and Prior</u>	<u>FY 1997 Budget</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Subtotal Product Development	78,028	22,744	30,831	33,041	CONT	CONT
Subtotal Support and Management	10,256	647	1,089	1,304	CONT	CONT
Subtotal Test and Evaluation	10,078	4,402	5,495	10,980	CONT	CONT
Total Project	98,362	27,793	37,415	45,325	CONT	CONT

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

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205620N

PROGRAM ELEMENT TITLE: Surface ASW Combat Sys Integration

(U) COST: (Dollars in Thousands)

PROJECT

NUMBERS & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
V0896 ASW Combat System Integration	0	621	2,014	2,999	3,795	2,295	2,212	CONT.	CONT.
V1916 Surface ASW System Improvements	6,412	6,939	7,376	12,596	15,043	16,661	13,130	CONT.	CONT.
<b>TOTAL</b>	<b>6,412</b>	<b>7,560</b>	<b>9,390</b>	<b>15,595</b>	<b>18,838</b>	<b>18,956</b>	<b>15,342</b>	<b>CONT.</b>	<b>CONT.</b>

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The objective of this program element is to incrementally modernize the existing AN/SQQ-89(V) system by providing contact fusion capabilities, improved data processing and classification performance, and develop an open system architecture. The open system architecture developed into the AN/SQQ-89(V) will enable further affordable performance growth to meet fleet requirements. Additionally, this PE supports the efforts to develop adjunct processing capability to process transmissions bistatically using the AN/SQS-53C or Towed Active Receiver Subsystem (TARS) as the receiver. Adjunct processing capability will be further enhanced by the development of the Multi-Function Towed Array (MFTA). The MFTA system will be engineered to perform as the receive array for the mid-frequency active sonar, torpedo defense, and BroadBand Variable Depth Sonar (developed by PE 0603553N) which will increase bandwidth over existing AN/SQQ-89(V) sensors and improve Measures Of Performance (MOP) in detection, tracking and classification. These efforts will provide a fully integrated AN/SQQ-89(V) ASW Combat System, with improved performance in the shallow, littoral environment.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it encompasses engineering and manufacturing development for upgrade of existing, operational systems.

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

DATE: February 1998

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0205620N      PROJECT NUMBER: V0896  
PROGRAM ELEMENT TITLE: Surface ASW Combat Sys Integ      PROJECT TITLE: ASW Combat Sys Integ

(U) COST (Dollars in thousands)

## PROJECT

NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
V0896 ASW Combat System Integration	0	621	2,014	2,999	3,795	2,295	2,212	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Surface ASW Combat Systems Integration project will fully support the integration of follow-on adjunct processing capabilities into the AN/SQQ-89(V) in these areas: 1) development of the MFTA to perform as the receive array for the mid-frequency active sonar, torpedo defense, and BroadBand Variable Depth Sonar, 2) implementation of the next incremental active classification improvement that will incorporate environmentally adaptive processing, and, 3) implementation of a follow-on mid-frequency bistatics capability to further improve detection, tracking, and classification of shallow water USW targets.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

### 1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$0) No funding allocated to V0896 in FY 1997.

### 2. (U) FY 1998 PLAN:

- (U) (\$300) Purchase TARS telemetry. Begin integration and test of the ability of the TARS telemetry and towed array hardware to function as the receiver for the mid-frequency active sonar, torpedo defense, and BroadBand Variable Depth Sonar.

R-1 Line Item 163

Budget Item Justification  
(Exhibit R-2, Page 2 of 14)

# UNCLASSIFIED

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0205620N      PROJECT NUMBER: V0896  
PROGRAM ELEMENT TITLE: Surface ASW Combat Sys Integ      PROJECT TITLE: ASW Combat Sys Integ

- (U) (\$321) Begin system design specification development for the MFTA. Perform Handling System Engineering studies. Begin the requisite studies and investigations to resolve engineering issues to support Installation Control Drawings.

3. (U) FY 1999 PLAN:

- (U) (\$1,330) Begin development of the MFTA mid-frequency processing system for the AN/SQQ-89(V).
- (U) (\$684) Complete MFTA system design specification development.

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	0	657	979
(U) Appropriated Value:	0	657	
Adjustments to Appropriated Value/ President's Budget:			
a. SQQ-89 / USW 21 Realignment			+1,018
b. Congressional undistributed reductions		-36	
c. Minor pricing adjustments			+17
(U) FY 1999 PRESBUDG Submit :	0	621	2,014

R-1 Line Item 163

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

# UNCLASSIFIED

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0205620N      PROJECT NUMBER: V0896  
PROGRAM ELEMENT TITLE: Surface ASW Combat Sys Integ      PROJECT TITLE: ASW Combat Sys Integ

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1998 decrease due to Congressional undistributed reductions (-36). FY 1999 increase due to increase for MFTA development (+1,018), and minor pricing adjustments (+17).

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

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

FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	TO	TOTAL
ACTUAL	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	COMPLETE	PROGRAM
(U) OPN P-1 Line Item 44 (CLI 213600, 213605)								
19,474	15,498	27,432	30,380	29,843	32,986	42,606	CONT.	CONT.

(U) RELATED RDT&E:

(U) PE 0603553N (Surface Anti-Submarine Warfare) - Advanced ASW Development

R-1 Line Item 163

Budget Item Justification  
(Exhibit R-2, Page 4 of 14)

# UNCLASSIFIED

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205620N

PROJECT NUMBER: V0896

PROGRAM ELEMENT TITLE: Surface ASW Combat Sys Integ

PROJECT TITLE: ASW Combat Sys Integ

D. (U) SCHEDULE PROFILE:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
Program Milestones		1Q Begin MFTA Project	
Engineering Milestones			4Q Complete MFTA System Design Specification
T&E Milestones			
Contract Milestones			

R-1 Line Item 163

Budget Item Justification  
(Exhibit R-2, Page 5 of 14)

# UNCLASSIFIED



# UNCLASSIFIED

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0205620N      PROJECT NUMBER: V1916  
PROGRAM ELEMENT TITLE: Surface ASW Combat Sys Integ      PROJECT TITLE: Surface ASW Sys Improv

(U) COST (Dollars in thousands)

## PROJECT

NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
V1916 Surface ASW Systems Improvements	6,412	6,939	7,376	12,596	15,043	16,661	13,130	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Surface ASW Systems Improvements project will fully support DDG-51 class ships and follow-on requirements, develop an open system architecture to allow enhanced or new functions to be integrated into the AN/SQQ-89(V) at reduced costs, and will provide: 1) torpedo alertment and countermeasure capability, 2) improved active classification algorithms for inclusion into the Echo Tracker Classifier (ETC) and TARS, 3) an ASW Data Link, 4) interface design for the Light Airborne Multi-Purpose System (LAMPS) Mk III Blk II system, and, 5) development of improved torpedo recognition algorithms for the AN/SQQ-89(V).

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

### 1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$2,177) Completed efforts to develop, test and evaluate AN/SQS-53C / AN/SQR-19 Bistatics prototype software.
- (U) (\$2,365) Began TARS processor Advanced Development Model (ADM).
- (U) (\$768) Developed, tested and evaluated the final ETC non real time software.
- (U) (\$670) Conducted developmental testing DT-IIIAN of an AN/SQQ-89(V)6 system with torpedo alertment and data fusion capabilities.
- (U) (\$432) Continued performance data analysis and modeling and simulation support using MOP and Measures of Effectiveness (MOE) methods.

R-1 Line Item 163

Budget Item Justification  
(Exhibit R-2, Page 6 of 14)

# UNCLASSIFIED

# UNCLASSIFIED

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0205620N      PROJECT NUMBER: V1916  
PROGRAM ELEMENT TITLE: Surface ASW Combat Sys Integ      PROJECT TITLE: Surface ASW Sys Improv

## 2. (U) FY 1998 PLAN:

- (U) (\$1,341) Complete evaluation of the Surveillance Towed Array Sensor System (SURTASS) passive software Build 12 for incorporation into the AN/SQQ-89(V).
- (U) (\$2,414) Continue TARS mid-frequency bistatic towed array processor ADM development. Support TARS array white ship sea test. Participate in TARS ADM gray ship demonstration. PE 0205620N will provide the mid-frequency bistatic towed array processor components (dry-end).
- (U) (\$900) Support transition of Active Classification Functional Baseline 1.0 algorithms which will improve ETC capability in active classification.
- (U) (\$875) Establish requirements for and demonstrate feasibility of an ASW Data Link (virtual) to support multi-platform coordinated ASW.
- (U) (\$249) Support towed array commonality development efforts including the integration of torpedo alertment and the TARS processor and array into the MFTA.
- (U) (\$748) Complete DT-IIIAN sea test data analysis and conduct an operational test & evaluation, operational assessment OA-III A, on an AN/SQQ-89(V)6 system with adjunct processing including torpedo alertment and data fusion capabilities.
- (U) (\$362) Continue performance data analysis and modeling and simulation support using MOP and MOE methods.
- (U) (\$50) Begin studies to reduce the radar cross section of the AN/SRQ-4 antenna.

R-1 Line Item 163

Budget Item Justification  
(Exhibit R-2, Page 7 of 14)

# UNCLASSIFIED

# UNCLASSIFIED

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0205620N      PROJECT NUMBER: V1916  
PROGRAM ELEMENT TITLE: Surface ASW Combat Sys Integ      PROJECT TITLE: Surface ASW Sys Improv

## 3. (U) FY 1999 PLAN:

- (U) (\$500) Complete data analysis from the TARS FY 1998 sea tests.
- (U) (\$1,177) Complete performance specification development for the TARS Engineering Development Model (EDM) to include active classification display upgrades.
- (U) (\$1,622) Complete transition of Active Classification Functional Baseline 1.0 algorithms for ETC to support implementation with the hull sensor and TARS.
- (U) (\$300) Continue demonstrating feasibility of an ASW Data Link (virtual) to support multi-platform coordinated ASW.
- (U) (\$1,078) Continue upgrades to the towed array Torpedo Recognition Alertment Functional Segment (TRAFS).
- (U) (\$275) Investigate AN/SQQ-89(V) display commonality issues, minimize display formats, and standardize operator-machine interfaces.
- (U) (\$190) Support Navy-wide towed array commonality development efforts.
- (U) (\$464) Conduct developmental testing DT-IIIIO of an AN/SQQ-89(V)6 system and commence planning for an operational test & evaluation, operational test OT-IIIG, on an AN/SQQ-89(V)6 system with active adjunct processing and the Sonar In-Situ Mode Assessment System (SIMAS) upgrade.
- (U) (\$520) Continue performance data analysis and modeling and simulation for bistatics using MOP and MOE methods.
- (U) (\$50) Continue investigation of options to reduce the AN/SRQ-4 antenna radar cross section.

R-1 Line Item 163

Budget Item Justification  
(Exhibit R-2, Page 8 of 14)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0205620N      PROJECT NUMBER: V1916  
PROGRAM ELEMENT TITLE: Surface ASW Combat Sys Integ      PROJECT TITLE: Surface ASW Sys Improv

- (U) (\$200) Design interfaces to support the LAMPS Mk III Blk II system.
- (U) (\$1,000) Develop improved torpedo detection algorithms for the AN/SQQ-89(V).

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	6,503	7,334	6,211
(U) Appropriated Value:	6,901	7,334	
(U) Adjustments to Appropriated Value/ President's Budget:			
a. SBIR transfer	-66		
b. Congressional undistributed reductions	-423	-395	
c. SQQ-89 / USW 21 Realignment			+1,200
d. Minor pricing adjustments			-35
(U) FY 1999 PRESBUDG Submit:	6,412	6,939	7,376

R-1 Line Item 163

Budget Item Justification  
(Exhibit R-2, Page 9 of 14)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0205620N      PROJECT NUMBER: V1916  
PROGRAM ELEMENT TITLE: Surface ASW Combat Sys Integ      PROJECT TITLE: Surface ASW Sys Improv

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1997 decreases for Small Business Innovative Research (SBIR) transfer (-66) and Congressional undistributed reductions (-423). FY 1998 decrease due to Congressional undistributed reductions (-395). FY 1999 increase for LAMPS Mk III Blk II (+200), improvement of torpedo detection algorithms (+1,000), and minor pricing adjustments (-35).

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

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

FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	TO	TOTAL
ACTUAL	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	COMPLETE	PROGRAM

(U) OPN P-1 Line Item 44 (CLI 213600, 213605)

19,474	15,498	27,432	30,380	29,843	32,986	42,606	CONT.	CONT.
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(U) RELATED RDT&E:

(U) PE 0603553N (Surface Anti-Submarine Warfare) - Advanced ASW Development

(U) PE 0604212N (Anti-Submarine Warfare & Other Helicopter Developments)

R-1 Line Item 163

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

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205620N

PROJECT NUMBER: V1916

PROGRAM ELEMENT TITLE: Surface ASW Combat Sys Integ

PROJECT TITLE: Surface ASW Sys Improv

## D. (U) SCHEDULE PROFILE:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
Program Milestones			
Engineering Milestones	4Q ETC Prototype Complete	4Q SURTASS Passive Evaluation Complete	4Q Active Classification Functional Baseline 1.0 Algorithms Transition Complete 4Q TARS EDM Performance Specification Development Complete
T&E Milestones	4Q DT-IIIAN Phase II at Sea Test	2Q OA-IIIA at Sea Test	4Q DT-IIIAO at Sea Test
Contract Milestones			

R-1 Line Item 163

Budget Item Justification  
(Exhibit R-2, Page 11 of 14)

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

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205620N

PROJECT NUMBER: V1916

PROGRAM ELEMENT TITLE: Surface ASW Combat Sys Integ

PROJECT TITLE: Surface ASW Sys Improv

## A. (U) PROJECT COST BREAKDOWN: (Dollars in Thousands)

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Primary H/W, S/W Development	4,447	4,554	5,184
b. Common Systems Engineering	190	347	280
c. Test & Evaluation	1,102	1,110	984
d. Program Management Support	508	763	763
e. Travel	165	165	165
Total	6,412	6,939	7,376

R-1 Line Item 163

RDT&E PE/Project Cost Breakdown  
(Exhibit R-3, Page 12 of 14)

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

DATE: February 1998

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0205620N      PROJECT NUMBER: V1916  
 PROGRAM ELEMENT TITLE: Surface ASW Combat Sys Integ      PROJECT TITLE: Surface ASW Sys Improv

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING (Dollars in Thousands)

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1996 & Prior	FY 1997 Actual	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development										
NUWC/NPT	WR	10/97	CONT.	CONT.	15,431	573	1,369	2,069	CONT.	CONT.
Misc	Var	Var	CONT.	CONT.	15,580	4,229	3,697	3,560	CONT.	CONT.
Support Costs and Management Services										
Misc	Var	Var	CONT.	CONT.	2,813	508	763	763	CONT.	CONT.
Test and Evaluation										
Misc	Var	Var	CONT.	CONT.	3,720	1,102	1,110	984	CONT.	CONT.

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RDT&E PE/Project Cost Breakdown  
(Exhibit R-3, Page 13 of 14)

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# UNCLASSIFIED

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

DATE: February 1998

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0205620N      PROJECT NUMBER: V1916  
 PROGRAM ELEMENT TITLE: Surface ASW Combat Sys Integ      PROJECT TITLE: Surface ASW Sys Improv

GOVERNMENT FURNISHED PROPERTY

Item	Contract Method/ Fund Type	Award/ Oblig	Delivery	Total	FY 1997	FY 1998	FY 1999	To	Total
<u>Description</u>	<u>Vehicle</u>	<u>Date</u>	<u>Date</u>	<u>&amp; Prior</u>	<u>Actual</u>	<u>Budget</u>	<u>Budget</u>	<u>Complete</u>	<u>Program</u>
Product Development									
AT&T	CPAF	12/93	03/94	112	0	0	0	0	112

Support Costs and Management Services  
 Not applicable

Test and Evaluation  
 Not applicable

	Total	FY 1997	FY 1998	FY 1999	To	Total
	<u>FY 1996</u>	<u>Actual</u>	<u>Budget</u>	<u>Budget</u>	<u>Complete</u>	<u>Program</u>
	<u>&amp; Prior</u>					
Subtotal Product Development	31,123	4,802	5,066	5,629	CONT.	CONT.
Subtotal Support and Management	2,813	508	763	763	CONT.	CONT.
Subtotal Test and Evaluation	3,720	1,102	1,110	984	CONT.	CONT.
Total Project	37,656	6,412	6,939	7,376	CONT.	CONT.

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

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205632N  
PROGRAM ELEMENT TITLE: MK48 ADCAP

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
V0366 MK48 ADCAP	10,491	10,451	17,550	18,471	16,797	24,494	29,409	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The MK 48 ADCAP (ADvanced CAPability) torpedo R&D program focuses on two specific areas through FY99: Guidance and Control (G&C) software block upgrades and wideband sonar capability. The Chief of Naval Operations continues to stress shallow water (less than 600 feet) as a critical operating area to counter third world diesel electric submarines. Torpedo testing in shallow water has demonstrated that in-service ADCAP has less than full capability in this difficult environment. However, this testing, in conjunction with laboratory simulation efforts, has shown that significant performance improvements can be made by implementing changes to weapon tactics and software algorithms. Development, implementation and testing of these changes is being accomplished under the ADCAP G&C software block upgrade program.

(U) The focus of the MK 48 ADCAP torpedo R&D program for FY99 and out has shifted from being primarily concentrated on Software Block Upgrade efforts to a coordinated hardware/software upgrade for countering evolving threats and maintaining robust performance. Countermeasure (CM) sophistication and availability on the open market directly affects ADCAP kill proficiency and its ability to counter rapidly evolving threats. The Common Broadband Advanced Sonar System (CBASS) program will develop and field a wideband sonar capable of identifying CMs and discriminating them from the target. CBASS received an ACAT III designation on 17 April 1997, with full rate production scheduled to begin in FY04.

(U) The introduction of phased prototyping in FY01 will provide a more rapid technology transition path for incremental torpedo improvements and upgrades (including the development and test of New Technology Concepts from the R&D community (6.2) and contractor Independent Research and Development (IR&D)). This approach will incorporate accelerated in-water testing of the new concepts allowing early Fleet input into future ADCAP upgrades and help to provide the foundation for Next Generation Torpedoes. These efforts will continue torpedo development investment at a lower cost and shorter term than traditional torpedo development programs.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it encompasses engineering and manufacturing development for upgrade of existing operational systems.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205632N  
PROGRAM ELEMENT TITLE: MK48 ADCAP

PROJECT NUMBER: V0366  
PROJECT TITLE: MK48 ADCAP

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$4,387) Completed the G&C Software Block Upgrade III Improvement Program in preparation for Operational Testing (OT), and the continued support and preparation of G&C Software Block Upgrade IV for Developmental Testing (DT). Conducted validation of safety features for new build releases of software block upgrades. Began software development efforts in support of improvements beyond those included in Block Upgrades III and IV to optimize torpedo effectiveness algorithm and processor techniques being developed by the 6.2/6.3 R&D community.
- (U) (\$1,689) Continued to support and upgrade to the Weapon Analysis Facility simulator to reflect latest G&C hardware configuration. Conducted simulation in support of Block Upgrade III OT and Block Upgrade IV DT.
- (U) (\$3,608) Completed in-water Operational Testing of Block Upgrade III, and continued Developmental Testing of Block Upgrade IV.
- (U) (\$341) Completed the design and development of the prototype MK48-based Improved Submarine Launched Mobile Mine (ISLMM) vehicles.
- (U) (\$216) CBASS: Conducted the initial studies and analysis of technology and conceptual design related to broadband processing methods required to counter advanced foreign countermeasures. Performed trade-off and comparative analysis on various wideband alternatives including array technologies being developed through ONR 6.2/6.3 programs.
- (U) (\$250) Prototyped new propulsion concepts resulting from 6.2 R&D technology initiatives in alternate fuels and reduced maintenance components.

2. (U) FY 1998 PLAN:

- (U) (\$4,152) Continue G&C Software Block Upgrade IV Improvement efforts in support of DT. Conduct validation of safety features for new build releases of software block upgrades. G&C Software improvements continue to optimize torpedo algorithm and processor effectiveness. Begin countermeasure analysis of current performance against evolving threat characteristics.
- (U) (\$1,274) Continue to support and upgrade the Weapon Analysis Facility simulator to reflect the latest G&C hardware configuration. Validate WAF to prepare for Block IV OT in FY00.

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

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205632N  
PROGRAM ELEMENT TITLE: MK48 ADCAP

PROJECT NUMBER: V0366  
PROJECT TITLE: MK48 ADCAP

- (U) (\$1,412) Continue DT of Software Block Upgrade IV.
  - (U) (\$93) Provide for COMOPTEVFOR Block Upgrade IV DT test support.
  - (U) (\$3,112) Continue development efforts on the CBASS wideband sonar system for the ADCAP MODs torpedo. Begin the development and manufacture of prototype wideband sonar systems. Continue to perform trade-off and comparative analysis on various wideband configurations including technologies being developed through ONR 6.2/6.3 programs.
  - (U) (\$408) Continue to develop, design and prototype new propulsion concepts resulting from 6.2 R&D technology. Begin the land based testing of alternate fuels/reduced maintenance propulsion concepts. Continue to evolve the alternate fuels/reduced maintenance propulsion system design.
3. (U) FY 1999 PLAN:
- (U) (\$6,743) Complete the development of G&C Software Block Upgrade IV in preparation for OT in FY00. G&C Software development efforts continue for improvements beyond the completion of Block Upgrades III and IV to provide enhancements to torpedo performance in adverse, shallow water countermeasure (CM) environments and increase bottom targeting capabilities that will address emerging/evolving threat characteristics. Conduct validation of safety features for new build releases of software block upgrades.
  - (U) (\$1,646) Continue to support and upgrade the Weapon Analysis Facility simulator to reflect latest G&C hardware configuration. Conduct simulation in support of Block Upgrade IV OT.
  - (U) (\$3,125) Complete Developmental Testing and prepare for Operational Testing in FY00 of Software Block Upgrade IV.
  - (U) (\$95) Provide for COMOPTEVFOR Block Upgrade IV DT test support.
  - (U) (\$5,388) CBASS development efforts continue toward integration of prototype components; nose array, receiver, transmitter, and preamplifier. Develop wideband-unique algorithms and signal processing software. Prepare for land-based testing, and in-water system self-noise runs in FY00.
  - (U) (\$553) Continue to develop, design and prototype new propulsion concepts. Continue land-based testing of alternate fuels and reduced maintenance propulsion components. Downselect to best prototype propulsion design.

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Budget Item Justification  
(Exhibit R-2, Page 3 of 8)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205632N  
PROGRAM ELEMENT TITLE: MK48 ADCAP

PROJECT NUMBER: V0366  
PROJECT TITLE: MK48 ADCAP

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	12,242	10,786	19,543
(U) Appropriated Value:	12,772	10,786	
(U) Adjustments to FY1997/98 Appropriated Value/			
(U) FY 1998 President's Budget			
a. Adjustment	-1,751	-335	-1,993
(U) FY 1999 PRESBUDG Submit:	10,491	10,451	17,550

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding:

FY97: Reduced by \$615K for FY97 Revised Economic Assumptions and by \$1136K for Update of the FY 1999 OSD/OMB Budget

FY98: Reduced by \$311K for General R&D Reductions and by \$24K for Revised Economic Assumptions.

FY99: Reduced by \$2,000K due to FY1999 funding constraints and decision to slow software block upgrade IV development. Reduced by \$531K for DBOF surcharge correction and Inflation Adjustments for Commercial purchases. Increase of \$538K for Navy Working Capital Fund for Undersea Warfare Centers and Pay Rate adjustments.

(U) Schedule: The reprogramming of \$2,000K from FY99 to FY00 shifted the Block Upgrade IV Operational Evaluation (OPEVAL) from 4QFY99 to approximately 3QFY00 and Block Upgrade IV IOC to 4QFY00.

(U) Technical: Not applicable

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

	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	TO	TOTAL
	ACTUAL	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	COMPLETE	PROGRAM
WPN/322500	52,313	53,518	52,813	52,187	50,606	61,594	69,198	CONT.	CONT.

(U) RELATED RDT&E: Not Applicable

# UNCLASSIFIED

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205632N  
PROGRAM ELEMENT TITLE: MK48 ADCAP

PROJECT NUMBER: V0366  
PROJECT TITLE: MK48 ADCAP

D. (U) SCHEDULE PROFILE:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>To Complete</u>
Program Milestones		1Q G&C BLK III IOC 2Q CBASS MS II		FY00 G&C BLK IV IOC
Engineering Milestones				FY00 CBASS CDRR
T&E Milestones	4Q G&C BLK III OT-IIIE 4Q G&C BLK IV DT-IIIF	4Q G&C BLK IV DT-IIIF	4Q G&C BLK IV DT-IIIF	FY00 G&C BLK IV OT-IIIF FY02 CBASS DT/OT FY03 CBASS OT
Contract Milestones		3Q CBASS EM&D CONTRACT		

R-1 Line Item 164

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

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

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205632N  
PROGRAM ELEMENT TITLE: MK48 ADCAP

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

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Hardware Development	793	3,455	5,880
b. Software Development	2,280	2,371	3,821
c. Systems Engineering	2,025	1,706	2,852
d. Development Test & Evaluation	3,541	1,478	3,187
e. Modeling & Simulation	1,658	1,251	1,630
f. Program Management	194	190	180
Total	10,491	10,451	17,550

R-1 Line Item 164

RDT&E Project Cost Breakdown  
(Exhibit R-3, Page 6 of 8)

# UNCLASSIFIED

# UNCLASSIFIED

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

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205632N  
PROGRAM ELEMENT TITLE: MK48 ADCAP

PROJECT NUMBER: V0366  
PROJECT TITLE: MK48 ADCAP

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

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1996 & Prior	FY 1997 Actual	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development										
NGC/HAC	C,FPI	SEP 93	16,904	16,904	16,904	0	0	0	0	16,904
CLEVELAND OH										
NGC/TBD	C,FFP	JUN 95	CONT.	CONT.	1,650	0	0	0	0	1,650
CLEVELAND OH										
TBD	C,CPIF	TBD	TBD	TBD	N/A	0	1,313	2,893	CONT.	CONT.
NUWC	WR	OCT 97	CONT.	CONT.	CONT.	6,119	6,566	10,423	CONT.	CONT.
NEWPORT RI/KEYPORT WA										
ARL/PSU	C,CPFF	FEB 98	CONT.	CONT.	CONT.	630	903	866	CONT.	CONT.
STATE COLLEGE PA										
Support and Management										
VARIOUS	VAR	VAR	CONT.	CONT.	CONT.	194	190	180	CONT.	CONT.
Test and Evaluation										
COMOPTEVFOR	WR	DEC 97	CONT.	CONT.	CONT.	0	93	95	CONT.	CONT.
NORFOLK VA										
NUWC	WR	OCT 97	CONT.	CONT.	CONT.	3,548	1,386	3,093	CONT.	CONT.
NEWPORT RI/KEYPORT WA										
GOVERNMENT FURNISHED PROPERTY										
Item Description	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Delivery Date		FY 1996 Actual	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Not Applicable					0	0	0	0	0	0



# UNCLASSIFIED

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

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205632N

PROJECT NUMBER: V0366

PROGRAM ELEMENT TITLE: MK48 ADCAP

PROJECT TITLE: MK48 ADCAP

PROJECT COST BREAKDOWN: (\$ in thousands)

	<u>Total</u> <u>FY 1996</u> <u>&amp; Prior</u>	<u>FY 1997</u> <u>Actual</u>	<u>FY 1998</u> <u>Budget</u>	<u>FY 1999</u> <u>Budget</u>	<u>To</u> <u>Complete</u>	<u>Total</u> <u>Program</u>
Subtotal Product Development	CONT.	6,749	8,782	14,182	CONT.	CONT.
Subtotal Support and Management	CONT.	194	190	180	CONT.	CONT.
Subtotal Test and Evaluation	CONT.	3,548	1,479	3,188	CONT.	CONT.
Total Project	CONT.	10,491	10,451	17,550	CONT.	CONT.

R-1 Line Item 164

RDT&E Project Cost Breakdown  
(Exhibit R-3, Page 8 of 8)

# UNCLASSIFIED

**UNCLASSIFIED**

DATE: February 1998

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205633N

PROGRAM ELEMENT TITLE: AVIATION IMPROVEMENTS

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 <u>ACTUAL</u>	FY 1998 <u>ESTIMATE</u>	FY 1999 <u>ESTIMATE</u>	FY 2000 <u>ESTIMATE</u>	FY 2001 <u>ESTIMATE</u>	FY 2002 <u>ESTIMATE</u>	FY 2003 <u>ESTIMATE</u>	TO <u>COMPLETE</u>	TOTAL <u>PROGRAM</u>
W0601 Common Ground Equipment	3,459	2,836	6,341	4,187	3,978	3,565	3,660	CONT.	CONT.
W0852 Consolidated Automated Support System (CASS)	7,028	8,563	8,862	8,780	8,957	9,088	9,285	CONT.	CONT.
W1041 Aircraft Equipment Reliability & Maintainability Improvement Program (AERMIP)	1,084	1,424	1,351	919	788	685	690	CONT.	CONT.
W1355 Aircraft Engine Component Improvement Program (CIP)	39,223	36,484	48,402	52,439	44,754	46,429	52,834	CONT.	CONT.
<b>TOTAL</b>	<b>50,794</b>	<b>49,307</b>	<b>64,956</b>	<b>66,325</b>	<b>58,477</b>	<b>59,767</b>	<b>66,469</b>	<b>CONT.</b>	<b>CONT.</b>

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: Common Ground Equipment is a Naval Aviation project to apply new technology to common support equipment necessary to support all aircraft. Consolidated Automated Support System (CASS) develops standardized Automated Test Equipment (ATE) with computer assisted, multi-function capabilities to support the maintenance of aircraft subsystems and missiles. AERMIP is the only Navy program that provides engineering support for in-service out-of-production aircraft equipment and provides increased readiness at reduced operational and support cost. Aircraft Engine CIP develops reliability and maintainability (R&M) and safety enhancements for in-service Navy aircraft engines, transmissions, propellers, starters, auxiliary power units, electrical generating systems, fuel systems, and fuels and lubricants.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it encompasses engineering and manufacturing for upgrade of existing operational systems.

R-1 Item no. 165

Exhibit R-2, RDT&E Budget Item Justification  
(Exhibit R-2, Page 1 of 25)

**UNCLASSIFIED**

**UNCLASSIFIED**

DATE: FEBRUARY 1998

FY1999 RDT&E BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0205633N  
PROGRAM ELEMENT TITLE: AVIATION IMPROVEMENTS

(U) COST (Dollars in thousands)

PROJECT NUMBER AND TITLE	FY1997 ACTUAL	FY1998 ESTIMATE	FY1999 ESTIMATE	FY2000 ESTIMATE	FY2001 ESTIMATE	FY2002 ESTIMATE	FY2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
W0601 Common Ground Equipment	3,459	2,836	6,341	4,187	3,978	3,565	3,660	CONT	CONT

RDT&E Articles 4  
(Advanced Borescope Equipment)

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project introduces effective, efficient fleet support equipment through the application of new technology, thereby improving fleet supportability and aircraft readiness.

(U) PROGRAM ACCOMPLISHMENTS:

1.(U) FY1997 Accomplishments:

- (U) (\$ 150) Continued USN involvement with US Army Advanced Boresight Equipment development program.
- (U) (\$ 110) Completed development and testing of the System Engineering Environment Test (SEET) standardization of Test Program Set (TPS) software development environment and Automatic Test Equipment (ATE) interface.
- (U) (\$ 600) Continued USN involvement with US Air Force (USAF) Joint Service Electronic Combat Tester.
- (U) (\$ 959) Continued USN involvement with USAF Next Generation Munitions Handler.
- (U) (\$ 40) Initiated and completed testing of the Aircraft De-icer.
- (U) (\$1,000) Initiated Universal Life Support Tester.

R-1 Item no. 165

Exhibit R-2, RDT&E Budget Item Justification  
(Exhibit R-2, Page 2 of 25)

# UNCLASSIFIED

DATE: FEBRUARY 1998

## FY1999 RDT&E BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0205633N  
PROGRAM ELEMENT TITLE: AVIATION IMPROVEMENTS

### 1.(U) FY1997 Accomplishments: Cont:

- (U) (\$ 600) Initiated Prototype Test Ultrasonic Pressure Cylinder Tester.

### 2. (U) FY 1998 Plan:

- (U) (\$ 290) Continue Advanced Boresight Equipment development program.
- (U) (\$ 750) Complete USN involvement with USAF Joint Service Electronic Combat Tester.
- (U) (\$1251) Continue USN involvement with USAF Next Generation Munitions Handler.
- (U) (\$ 150) Initiate development of Universal Aircraft Axle Jack.
- (U) (\$ 95) Initiate development of an Automated Engine Turning Tool.
- (U) (\$ 145) Initiate development of Universal Chock Adapters.
- (U) (\$ 115) Initiate development of Advanced Armament Trailer A/M 32U-13.
- (U) (\$ 40) Initiate and complete development of Common Missile Gel Pad.

### 3. (U) FY 1999 Plan:

- (U) (\$3020) Continue Advanced Boresight Equipment development program.
- (U) (\$1000) Continue development of USAF Next Generation Munitions Handler.
- (U) (\$ 275) Continue development of Universal Aircraft Axle Jack.
- (U) (\$ 141) Continue developing Automated Engine Turning Tool.
- (U) (\$ 110) Continue developing Universal Chock Adapter.
- (U) (\$ 315) Initiate development of a state-of-the-art Fuel System for Standard Engine Test Systems.
- (U) (\$ 655) Initiate development of Rough Terrain Tow Vehicle for USMC Rapid Deployment.
- (U) (\$ 825) Initiate development of Turbo Prop Engine Test Enclosure.

R-1 Item no. 165

Exhibit R-2, RDT&E Budget Item Justification  
(Exhibit R-2, Page 3 of 25)

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UNCLASSIFIED

DATE: FEBRUARY 1998

FY1999 RDT&E BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0205633N
PROGRAM ELEMENT TITLE: AVIATION IMPROVEMENTS

B. (U) PROGRAM CHANGE SUMMARY:

Table with 4 columns: Description, FY1997, FY1998, FY1999. Rows include FY1998 Presidents Budget, Appropriated Value, Adjustments from PRESBUD, and FY1999 PRES Budget Submit.

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding:
FY 1997: -40 for Small business Initiative Requirement (SBIR), +1414 for a Navy program adjustment and -4 for revised economic reductions.
FY 1998: -152 for Congressional Undistributed Reductions.
FY 1999: -1029 for miscellaneous reductions.

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

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

Table with 9 columns: FY1997 ACTUAL, FY1998 ESTIMATE, FY1999 ESTIMATE, FY2000 ESTIMATE, FY2001 ESTIMATE, FY2002 ESTIMATE, FY2003 ESTIMATE, TO COMPLETE, TOTAL PROGRAM. Rows include APN-7 (47C2) and OMN.

(U) RELATED RDT&E: N/A

D. (U) SCHEDULE PROFILE: N/A

R-1 Item no. 165

Exhibit R-2, RDT&E Budget Item Justification
(Exhibit R-2, Page 4 of 25)

**UNCLASSIFIED**

DATE: FEBRUARY 1998

FY1999 RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0205633N      PROJECT NUMBER: W0601  
PROGRAM ELEMENT TITLE: Aviation Improvement      PROJECT TITLE: Common Ground  
Equipment

A. (U) PROJECT COST BREAKDOWN: (Dollars in thousands)

Project Cost Categories	FY1997	FY1998	FY1999
a. Software Development	200	0	0
b. Developmental Test & Evaluation	300	200	300
c. Development SE Acquisition	2,959	2,636	6,041
TOTAL	3,459	2,836	6,341

R-1 Item no. 165

Exhibit R-3 RDT&E Budget Item Justification  
(Exhibit R-3 Page 5 of 25)

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DATE: FEBRUARY 1998

FY1999 RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0205633N      PROJECT NUMBER: W0601  
 PROGRAM ELEMENT TITLE: Aviation Improvement      PROJECT TITLE: Common Ground Equipment

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

Performing Organizations

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1996 & Prior	FY1997 Actual	FY1998 Budget	FY1999 Budget	FY2000 Budget	To Complete	Total Program
Product Development											
AAI Corp	Cockeysville MD										
	FP	5/19/94	6,729	6,729	2,760	0	0	3,020	0	CONT	CONT
Misc (Gov)	WR				9.703	3,159	2,636	3,021	3,887	CONT	CONT
Support and Management - N/A											
Test and Evaluation											
Misc		10/98				300	200	300	300	CONT	CONT
Government Furnished Property - N/A											
Subtotal Product Development						3,159	2,636	6,041	3,887	CONT	CONT
Subtotal Support Management						0	0	0	0	0	0
Subtotal Test and Evaluation						300	200	300	300	CONT	CONT
Total Project						3,459	2,836	6,341	4,187	CONT	CONT

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

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0205633N
PROGRAM ELEMENT TITLE: AVIATION IMPROVEMENTS

(U) COST (Dollars in thousands)

Table with columns: PROJECT NUMBER AND TITLE, FY1997 ACTUAL, FY1998 ESTIMATE, FY1999 ESTIMATE, FY2000 ESTIMATE, FY2001 ESTIMATE, FY2002 ESTIMATE, FY2003 ESTIMATE, TO COMPLETE, TOTAL PROGRAM. Row: W0852 Consolidated Automated Support System.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Consolidated Automated Support System (CASS) project designs and develops modularly constructed automated test equipment with computer-assisted, multi-functional capability based, standardized hardware and software elements. CASS responds to Fleet Commanders' expressed requirements to correct serious deficiencies in existing automatic test equipment. Program objectives are: (1) increase material readiness; (2) reduce life cycle costs through standardization; (3) improve tester sustainability at depot and intermediate maintenance levels; (4) reduce proliferation of unique test equipment; and (5) provide test capability for existing and future avionics/electronic systems. Current effort addresses the joint development of a CASS All-Up-Round (AUR) and guidance section missile test capability.

(U) PROGRAM ACCOMPLISHMENTS:

1. (U) FY 1997 Accomplishments:

- (U) (\$1,760) Continued development of DOD Automatic Test System (ATS) Standard Interfaces and architectures.
(U) (\$1,000) Continued development of High Speed Digital Data Bus interfaces and software emulation.
(U) (\$2,165) Continued development of A Broad Base Environment for Test (ABBET) standards for DOD common instrument control software.
(U) (\$1,103) Completed development of Radio Frequency (RF) phase noise test capability.

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

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205633N

PROGRAM ELEMENT TITLE: AVIATION IMPROVEMENTS

- (U) (\$1,000) Completed development of RF switching, and load capability, and commence and complete development of millimeter wave generation source.

2. (U) FY 1998 PLAN:

- (U) (\$1,400) Continue development of DOD ATS standard interfaces and architectures.
- (U) (\$1,400) Continue development of ABBET standards instrument control software.
- (U) (\$ 612) Complete development of High Speed Digital Data Bus interfaces and commence development on Common Bus Emulator Test (CBET).
- (U) (\$2,062) Commence Electro-Optic (EO) upgrades to include tunable lasers and wide-band focal plan arrays.
- (U) (\$1,864) Commence development of instrument control upgrades and virtual instruments.
- (U) (\$1,225) Commence development of advanced digital/video process.

3. (U) FY 1999 Plan:

- (U) (\$1,437) Continue development of DOD ATS standard interfaces and architectures.
- (U) (\$1,441) Continue development of ABBET standards instrument control software.
- (U) (\$ 910) Continue development of CBET.
- (U) (\$2,247) Continue EO upgrades to include tunable lasers and wide band focal plane arrays.
- (U) (\$1,820) Continue development of instrument control upgrades and virtual instruments.
- (U) (\$1,007) Continue development of advanced digital and video process.

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

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205633N  
PROGRAM ELEMENT TITLE: AVIATION IMPROVEMENTS

B. PROGRAM CHANGE SUMMARY:

	FY1997	FY1998	FY1999
(U) FY1998 Presidents Budget:	7,220	8,951	8,969
(U) Appropriated Value:		8,951	
(U) Adjustments from PRESBUDG:	( 192)	( 388)	( 107)
(U) FY1999 PRES Budget Submit:	7,028	8,563	8,862

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1997: -183 for Small Business Initiative Requirement (SBIR) and -9 for revised economic reductions.  
 FY 1998: -388 for Congressional undistributed reduction.  
 FY 1999: -156 for commercial purchases inflation, +61 for NWCF and NADEP adjustments and -12 miscellaneous reduction.

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

W. (U) OTHER PROGRAM FUNDING SUMMARY (Dollars in thousands)

	FY1997 ACTUAL	FY1998 ESTIMATE	FY1999 ESTIMATE	FY2000 ESTIMATE	FY2001 ESTIMATE	FY2002 ESTIMATE	FY2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
(U) APN-7 (47C2)	105,605	99,319	108,166	106,292	114,445	116,700	119,545	CONT	CONT
(U) OMN	1,100	900	300						9,000

(U) RELATED RDT&E: PE 0604746A Automated Test Equipment Development

(U) A Memorandum of Understanding has been executed between the US Army and NAVAIR (March 1991) for technical support and procurement of the CASS EO subsystem for integration with the Army's Integrated Family of Test Equipment (IFTE) program.

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

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205633N

PROGRAM ELEMENT TITLE: AVIATION IMPROVEMENTS

(U) SCHEDULE PROFILE:

	FY1997	FY1998	FY1999	TO COMPLETE
PRORAM MILESTONES		III 7/98		
ENGINEERING MILESTONES		EO+		
T& E O+ DT&E MILESTONES		EO+ FOT&E		
CONTRACT MILESTONES		OT-IIIIB 1/98		

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

FY1999 RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0205633N      PROJECT NUMBER: W0852  
PROGRAM ELEMENT TITLE: Aviation Improvement      PROJECT TITLE: Consolidated Automated Support System

A.(U) PROJECT COST BREAKDOWN: (Dollars in thousands)

Project Cost Categories	FY1997	FY1998	FY1999
a. Development SE Acquisition	0	0	0
b. Ancillary H/W Development	1,700	2,250	2,291
c. Systems Development	3,364	4,275	4,140
d. Systems Engineering	1,964	2,038	2,431
TOTAL	7,028	8,563	8,862

R-1 Item no. 165

Exhibit R-3 RDT&E Budget Item Justification  
(Exhibit R-3 Page 11 of 25)

**UNCLASSIFIED**

**UNCLASSIFIED**

DATE: FEBRUARY 1998

FY1999 RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0205633N      PROJECT NUMBER: W0852  
 PROGRAM ELEMENT TITLE: Aviation Improvement      PROJECT TITLE: Consolidated Automated Support System

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

Performing Organizations

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award Oblig Date	Perform Activity EAC	Project Office EAC	Total FY1996 & Prior	FY1997 Actual	FY1998 Budget	FY1999 Budget	To Complete	Total Program
Product Development										
Hughes/USAF										
Tucson, AZ	FPI	9/3/95	43,627	43,627	43,627					43,627
LMC, Orlando	FL FPI	1/15/95	21,000	21,000	6,614	2,083	3,537	3,823	CONT	CONT
Misc (Gov)	WR/PD		2,621	2,621	2,621					2,621
NAWC Lakehurst	NJ		25,000	25,000	6,998	4,527	4,014	4,005	CONT	CONT
Support and Management										
Misc (Gov)	WX/MIPR		8,472	8,472		418	1,012	1,034	CONT	CONT
Test and Evaluation - N/A										
Government Furnished Property - N/A										
Subtotal Product Development					59,860	6,610	7,551	7,828	CONT	CONT
Subtotal Support Management					2,210	418	1,012	1,034	CONT	CONT
Subtotal Test and Evaluation					0	0	0	0	CONT	CONT
Total Project					61,970	7,028	8,563	8,862	CONT	CONT

R-1 Item no. 165

Exhibit R-3 RDT&E Budget Item Justification  
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# UNCLASSIFIED

DATE: February 1998

## FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205633N

PROGRAM ELEMENT TITLE: Aviation Improvements

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
W1041 Aircraft Equipment Reliability & Maintainability Improvement Program (AERMIP)	1,084	1,424	1,351	919	788	685	690	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: AERMIP is the only Navy program which provides Research, Development, Test & Evaluation (RDT&E) engineering support specifically for in-service, out-of-production aircraft equipment. AERMIP increases readiness through Reliability and Maintainability (R&M) and safety improvements to existing systems and equipment installed in Naval aircraft. It meets affordable readiness objectives by providing a cost effective solution to obsolescence problems encountered when service lives are extended, and promotes commonality and standardization across aircraft platform lines and among the services through extension of application and use of non-developmental items. AERMIP also decreases life cycle costs through reduced operational and support costs. AERMIP facilitates the Operational, Safety, and Improvement Program by applying proven low-risk solutions to current fleet problems. AERMIP also funds high priority flight testing which is not associated with any acquisition or development program under the Flight Test General (FTG) task.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$1084) Continued prior R&M improvements, including Altitude Heading Reference System (AHRS) and SKYFLEX. Initiated new improvement tasks such as E2/C2 Cowling Latch. Continued identification, analysis, and evaluation of AERMIP candidates.

2. (U) FY 1998 PLAN:

- (U) (\$1424) Complete Replacement AHRS and S-3B SKYFLEX Evaluation. Continue multi-platform SKYFLEX evaluation, E2/C2 Cowling latch, and MA-1 compass improvements. Significantly improve identification, analysis, and evaluation of AERMIP candidates via use of Logistics Management Decision Support System (LMDSS).

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

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0205633N PROJECT NUMBER: W1041
PROGRAM ELEMENT TITLE: Aviation Improvements PROJECT TITLE: Aircraft Equipment Reliability and Maintainability Improvement Program

- 3. (U) FY 1999 PLAN:
• (U) (\$1351) Continue/complete SKYFLEX, E2/C2 Cowling Latch, and MA-1 compass improvements. Initiate Multiplace Liferaft Improvement Program. Investigate high value payback return on investment candidates.

B. (U) PROGRAM CHANGE SUMMARY:

Table with 4 columns: Description, FY 1997, FY 1998, FY 1999. Rows include: (U) FY 1998 President's Budget: 1,085, 1,479, 1,395; (U) Appropriated Value: 1,479; (U) Adjustments from PRESBUDG: -1, -55, -44; (U) FY 1999 President's Budget: 1,084, 1,424, 1,351.

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1997 reflects a decrease of \$1 thousand for revised economic adjustments. FY 1998 reflects a decrease of \$55 thousand for Congressional Undistributed reductions. 1999 reflects decreases of \$20 thousand for Navy Working Capital Fund surcharges and \$24 thousand for inflation adjustments.

(U) Schedule: Not Applicable.

(U) Technical: Not Applicable.

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

D. (U) SCHEDULE PROFILE: Not Applicable

# UNCLASSIFIED

DATE: February 1998

## FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205633N

PROGRAM ELEMENT TITLE: AVIATION IMPROVEMENTS

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
W1355 Aircraft Engine Component Improvement Program (CIP)	39,223	36,484	48,402	52,439	44,754	46,429	52,834	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Aircraft Engine CIP provides the only source of critical design and development engineering support to resolve safety, reliability and maintainability deficiencies of in-service Navy aircraft propulsion systems. The highest priority issues CIP addresses concern safety-of-flight deficiencies. The program also corrects service-revealed deficiencies, improves Operational Readiness (OR) and Reliability and Maintainability (R&M), and reduces platform Life Cycle Cost (LCC). Budgets are allocated across platform-specific teams and multi-platform product support teams based upon long term strategies to achieve safety and affordable readiness goals; the R-3 exhibit details annual portions of those long-term plans. CIP tasks have reduced the rate of in-flight aborts, safety incidents, non-mission capable rates, scheduled and unscheduled engine removals, maintenance work hours, and overall cost of ownership. This is accomplished through the maintenance and validation of specification performance, testing to qualify engineering changes, verifying life limits, and improving the inherent reliability of the propulsion system as an integral part of Reliability Centered Maintenance (RCM) initiatives. Historically, the missions, tactics, and environmental exposure of military aircraft systems change to meet new threats or operational demands, and often result in unforeseen problems, which if not corrected, can cause critical safety/readiness degradation, such as those experienced during DESERT SHIELD/DESERT STORM operations due to sand erosion. In addition, new problems arise through actual use during deployment of the aircraft. Development programs, while geared to resolve as many problems as possible before deployment, cannot duplicate actual operations or account for the vast array of environmental and usage variables, particularly when aircraft missions vary from those the aircraft was designed to perform. Therefore, it has been found that CIP can provide an immediate engineering response to these flight-critical problems and accelerated engine testing can avoid potential problems. CIP starts after development and Navy acceptance of the first production article and addresses usage and life problems not covered by warranties. CIP addresses engines, transmissions, propellers, starters, auxiliary power units, electrical generating systems, and fuel and lubricant systems. CIP efforts continue over the system's life, gradually decreasing to a minimum level sufficient to maintain the reliability, and decrease the operating costs, of older inventory. CIP is a highly leveraged and cooperative tri-service program with Foreign Military Sales participation.

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DATE: February 1998

## FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205633N

PROJECT NUMBER: W1355

PROGRAM ELEMENT TITLE: AVIATION IMPROVEMENTS

PROJECT TITLE: AIRCRAFT ENGINE CIP

### 1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$34,013) Platform-Specific Accomplishments.
  - Initiated redesign efforts for E-2/C-2/C-130 propeller systems.
  - Reduced F404 (F/A-18) bare firewalls from 165 to 15 (Jan 96 to Jan 97).
  - Continued or initiated 20 projects on the F404 engine including redesigning the afterburner flameholder (#1 engine removal driver), improving flightline troubleshooting procedures, nozzle durability improvements, and parts life verification.
  - Continued or initiated 15 projects on the F-14B/D including improvements to High Pressure Turbine nozzles, bearings, and fan blades. Revised rework procedures for the F-14A main fuel control resulting in a 600% increase in reliability; also completed age explorations of seven other components.
  - Performed Accelerated Simulated Mission Engine Test (ASMET) and improved the turbine exhaust case on the J52 engine (EA-6B).
  - Completed eight projects on the T45 including new life limits and durability improvements.
  - Performed improvement efforts on the H-1 tail rotor drive system, torque control unit, and electrical components.
  - Performed a flight test on the AV-8B Inlet Guide Vane Controller, an altitude test on the F402 engine, and improvements on electrostatic emissions monitoring system.
  - Continued research into the causes and conditions of power losses on T700 engine (H-60, H-1) and low power issues in the T64 engine (H-53).
- (U) (\$5,210) Multi-platform Product Support.
  - Completed 7 and continued 6 electrical projects including guidelines for the use of commercial off-the-shelf (COTS) items aboard military aircraft, test procedures, and qualification of Ultra-low Maintenance (ULM) batteries.
  - Continued two and completed two projects supporting Helicopter Integrated Diagnostics (HIDs) technology development, development of a T700 performance algorithm, and addition of helicopter diagnostics to helo master plan.
  - Continued blade and vane repair improvements expected to yield a 50% increase in productivity, half the turnaround time, and an 80% reduction in rework.
  - Investigated and resolved over 100 fleet problems in fuels, lubricants and refueling operations, continued to work the issue of Navy compatibility with USAF JP-8 +100 fuel additive, published revised NATOPs Manual on refueling procedures, introduced high thermal stability lube oil (to be tested on the H-

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BUDGET ACTIVITY: 7                    PROGRAM ELEMENT: 0205633N                    PROJECT NUMBER: W1355  
PROGRAM ELEMENT TITLE: AVIATION IMPROVEMENTS                    PROJECT TITLE: AIRCRAFT ENGINE CIP

60), completed study on an optimum helicopter transmission lubricant, evaluated 12 gas path cleaners for effect on engine performance and life. Initiated an upgrade of the starter qualified parts list, and identified critical bearings for all engines as part of industry/government QA initiative.

### 2. (U) FY 1998 PLAN:

- (U)(\$32,160) Platform-specific efforts.
  - T56 engine (P-3, E-2, C-2, C-130) improve the maintenance plan, qualify alternative sources of parts, complete fuel nozzle redesign, continue propeller integration efforts to reduce NMC rates, evaluate USAF JP-8 fuel additives.
  - E-2/C-2/C-130 increase electrical capacity and performance, eliminate starter failures; continue propeller redesign efforts, investigate cause of hot section damage.
  - S-3 continue efforts to reduce the number of bare firewalls, complete mission analysis, resolve single engine rate of climb issues, develop field hardware inspection plan.
  - F/A-18C/D continue efforts designed reduce engine module shop visit rate and increase engine availability, optimize module time on wing, solve borescope plug retention issue.
  - F-14A address the top two reasons for unscheduled engine removals, sustaining engineering efforts and new problem resolution.
  - F-14B/D address the top four reasons for unscheduled engine removals and top two engine repair cost drivers; optimize engine mean time between removal versus the cost of repair.
  - Mature Aircraft (EA-6B, T-2) address the top four readiness degraders, the top two Aviation Depot Level Repairable (AVDLR) costs, troubleshooting procedures, and electrical system reliability and durability.
  - H-2/H-60 improve engine availability, reduce organizational level maintenance requirements, addressing the top two engine removal drivers, and number one Not-Mission-Capable driver; resolve engine flameout issue; qualify advanced helicopter transmission lubricant.
  - AV-8B address top safety of flight issues, engine removal drivers, mission failure drivers; reduce maintenance man hours per flight hour, address parts obsolescence, improve diagnostics, continue efforts on digital engine control unit.
  - H-53/H-46/H-3 address the number one cause for engine removal and number one maintenance cost driver, improve main fuel control, continue power loss investigation/correction.
  - H-1, address time-between-overhaul, high-time parts, and the number one engine removal driver; support to 4BW/4BN programs; finish redesign of torque control limiter.
  - T-45 address platform safety, specification compliance, readiness, life management, and lowered flight hour cost.

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BUDGET ACTIVITY: 7

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PROJECT NUMBER: W1355

PROGRAM ELEMENT TITLE: AVIATION IMPROVEMENTS

PROJECT TITLE: AIRCRAFT ENGINE CIP

- (U) (\$4,324) Multi-Platform Product Support. Complete 10 projects, continue 41 projects, and initiate 10 projects designed to provide common support to multiple platforms in the areas of improved drive systems, secondary power and mechanical systems; improved tools for performance analysis, modeling and simulation, diagnostics, engine reliability assessment, and structural integrity; improved products and processes for fuels, lubricants, and refueling equipment; improved life cycle support; and improved electrical system product support and battery systems.
3. (U) FY 1999 PLAN:
- (U) (\$42,720) Platform-specific efforts.
    - T56 engine (P-3, E-2, C-2, C-130) continue propeller integration efforts with potential propeller designs, perform engine hot section corrosion and fatigue analysis, and continue bearing improvements.
    - E-2/C-2/C-130 continue propeller improvement program, eliminate starter failures, continue generator improvement program to triple durability.
    - S-3 qualify lube system design improvements, conduct control system reliability and maintainability analysis, validate and implement recommended part life changes.
    - F/A-18C/D continue efforts on afterburner flameholder redesign, blade redesigns, and afterburner case wear; begin efforts on bearing redesign, redesign metal hoses to reduce number of unique parts, reduce oil sump consumption.
    - Mature Aircraft address the top readiness degraders and AVDLR costs; perform an ASMET test on the J52 engine (EA-6B), correct deficiencies in #3 hub, study "tired iron" issues and identify future obsolescence problems.
    - H-2/H-60 improve engine availability, reduce organizational level maintenance requirements, finish qualification and testing of advanced transmission lubricant, establish engine dynamic component life limits.
    - AV-8B continue to address safety of flight issues, engine removal drivers, and mission failure drivers. Continue efforts on digital engine control unit; resolve power lever actuator vibration problem, and conduct an ASMET test on the F402-408 engine.
    - H-53/H-46/H-3 continue efforts on the top cause for engine removals; transition program to reliability-centered maintenance; and perform running engine wash test, improve oil seals, continue power loss investigation and correction.
    - H-1 continue to improve time-between-overhaul and reduce impact of high-time parts, support to 4BW/4BN programs, continue improvements on tail rotor drive system.

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BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205633N

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PROGRAM ELEMENT TITLE: AVIATION IMPROVEMENTS

PROJECT TITLE: AIRCRAFT ENGINE CIP

- T-45 continue to address platform safety, specification compliance, mission profile updates, and life cycle management.
- F-14A perform minimal level of sustaining engineering.
- F-14B/D addressing the top reasons for unscheduled engine removals and repair cost drivers, initiate improvements to controls and accessories.
- F/A-18E/F and V-22 initiate CIP programs addressing durability improvements identified during qualification testing, begin a life cycle management program, conduct "lead the fleet" testing to identify potential deficiencies prior to manifestation in fleet - resolve through warranty as appropriate
- (U) (\$5,682) Multi-Platform Product Support Teams. Complete 12 projects, continue 28 projects, initiate 8 projects designed to provide common support to multiple platforms in the areas of improved drive systems, secondary power and mechanical systems; improved tools for performance analysis, modeling and simulation, diagnostics, engine reliability assessment, and structural integrity; improved products and processes for fuels, lubricants, and refueling equipment; improved blade and vane repair processes and life cycle support; and improved electrical system product support and battery systems.

### B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	40,934	46,607	51,783
(U) Appropriated Value:		37,607	
(U) Adjustments from President's Budget:	-1,711	-10,123	-3,381
(U) FY 1999 President's Budget Submit:	39,223	36,484	48,402

### (U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1997 decrease reflects \$163 thousand for the Small Business Innovation Research (SBIR) assessment, \$50 thousand for revised economic assumptions, and \$1,498 for higher DoD priorities. FY 1998 decrease reflects a \$9000 thousand Congressional reduction to defer proposed engine component improvement new start initiatives until next year when the production programs are more mature, and a decrease of \$1,123 for Congressional undistributed reductions. FY 1999 net decrease reflects reductions \$2,857 for higher DoD

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY:                   PROGRAM ELEMENT: 0205633N                   PROJECT NUMBER: W1355  
                                  PROGRAM ELEMENT TITLE: AVIATION IMPROVEMENTS           PROJECT TITLE: AIRCRAFT ENGINE CIP

priorities; \$835 thousand decrease for revised economic assumptions, \$113 thousand for Navy Working Capital Fund (NWCF) surcharges, and \$68 thousand for minor program adjustments. These decreases are partially offset by a \$492 thousand increase for Naval Air Warfare Center (NAWC) and Naval Aviation Depot (NADEP) adjustments.

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

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

(U) RELATED RDT&E:

(U) PE 0203752A (Aircraft Engine CIP Army)

(U) PE 0207268F (Aircraft Engine CIP Air Force)

(U) PE 0603217N (Air Systems Advanced Tech. Dev.)

D. (U) SCHEDULE PROFILE: Not Applicable.

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

BUDGET ACTIVITY:

PROGRAM ELEMENT: 0205633N

PROJECT NUMBER: W1355

PROGRAM ELEMENT TITLE: AVIATION IMPROVEMENTS

PROJECT TITLE: AIRCRAFT ENGINE CIP

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

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Product Development	34,544	32,283	41,846
b. Support and Management	620	845	950
c. Test and Evaluation	4,059	3,356	5,606
Total	39,223	36,484	48,402

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DATE: February 1998

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

BUDGET ACTIVITY: 7                      PROGRAM ELEMENT: 0205633N                      PROJECT NUMBER: W1355  
PROGRAM ELEMENT TITLE: AVIATION IMPROVEMENTS                      PROJECT TITLE: AIRCRAFT ENGINE CIP

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

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1996 & Prior	FY 1997 Actual	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development										
MAJOR EFFORTS (\$1.0M OR MORE )										
F110 ENGINE PROGRAM										
F3365795C0055	GE CPAF	10/97	CONT.	CONT.	3,803	2,356	2,027	2,120	CONT.	CONT.
(EVENDALE, OHIO)										
F402 ENGINE PROGRAM										
N0001996C0172	RR CPAF	10/97	CONT.	CONT.	1,733	1,815	2,605	1,910	CONT.	CONT.
N0001996C0134	UK CPFF	10/97	CONT.	CONT.	2,766	1,565	1,166	1,990	CONT.	CONT.
(BRISTOL, ENGLAND)										
F404/T58/T64 ENGINE PROGRAM										
N0001993C0060	GE CPFF	11/93	CONT.	CONT.	32,224	0	0	0	0	32,224
N0001995C0129	GE CPFF	10/97	CONT.	CONT.	4,018	5,514	5,333	6,500	CONT.	CONT.
(LYNN, MASSACHUSETTS)										
J52 ENGINE PROGRAM										
N6852095C0007	P&W CPFF	10/95	CONT.	CONT.	4,967	0	0	0	0	4,967
N0001997C2004	P&W CPFF	10/97				2,385	1,901	2,744	CONT.	CONT.
(WEST PALM BEACH, FLORIDA)										
T56 ENGINE PROGRAM										
F4160893C856	ALLISON	4/93	CONT.	CONT.	8,221	1,504	1,394	1,850	CONT.	CONT.
(INDIANAPOLIS, INDIANA)										

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

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205633N

PROJECT NUMBER: W1355

PROGRAM ELEMENT TITLE: AVIATION IMPROVEMENTS

PROJECT TITLE: AIRCRAFT ENGINE CIP

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1996 & Prior	FY 1997 Actual	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development MAJOR EFFORTS (\$1.0M OR MORE)										
F405 ENGINE PROGRAM										
N0001995C0170 RR CPAF		10/97	CONT.	CONT.	2,038	901	1,900	1,260	CONT.	CONT.
(BRISTOL, ENGLAND)										
F414 ENGINE PROGRAM										
NAVAIR CONTRACT GE CPFF		TBD	TBD	TBD	0	0	0	4,150	CONT.	CONT.
(LYNN, MASSACHUSETTS)										
T700 ENGINE PROGRAM										
DAAJ0995C0101 GE CPFF		10/97	CONT.	CONT	2,764	1,315	1,092	1,325	CONT.	CONT.
(LYNN, MASSACHUSETTS)										
TF34 ENGINE PROGRAM										
F1460895C1461 GE CPFF		10/97	CONT.	CONT	1,375	505	540	1,150	CONT.	CONT.
(LYNN, MASSACHUSETTS)										
T406 ENGINE PROGRAM										
NAVAIR CONTRACT ALLISON CPFF		TBD	TBD	TBD	0	0	0	2,165	CONT.	CONT.
(INDIANAPOLIS, INDIANA)										
All other contracts under \$1.0M (Aggregate Total):					5,8251,304	2,030	1,005	CONT.	CONT.	
Subtotal Contracts:					69,734	19,164	19,988	28,169	CONT.	CONT.

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

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205633N

PROJECT NUMBER: W1355

PROGRAM ELEMENT TITLE: AVIATION IMPROVEMENTS

PROJECT TITLE: AIRCRAFT ENGINE CIP

Contract

Item	Method/ Fund Type	Award/ Oblig	Perform Activity	Project Office	Total FY 1996 & Prior	FY 1997 Actual	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Description	Vehicle	Date	EAC	EAC						

Product Development  
Lab/Field Activity (\$1.0M or more)

NAWC PAX CIP SPT. WX	10/97	CONT.	CONT.		34,077	13,949	10,998	12,176	CONT.	CONT.
All other in-house support under \$1.0M (Aggregate Total):										
VARIOUS	VARIOUS	10/97	CONT.	CONT.	6,896	1,103	947	1,039	CONT.	CONT.
Subtotal Lab\Activity\Other:					40,973	15,052	11,945	13,215	CONT.	CONT.

GOVERNMENT FURNISHED PROPERTY

Product Development										
All other GFP: (FUEL) MD INCREMENTAL					2,207	328	350	462	CONT.	CONT.
Total Product Development					112,914	34,544	32,283	41,846		
Test and Evaluation:										
F404/T58/T64 ENGINE PROGRAM										
N0001995C0129 GE CPFF	10/97	CONT.	CONT.		3,000	3,000	1,500	2,300	CONT.	CONT.
(LYNN, MASSACHUSETTS)										
All other contracts under \$1.0M (Aggregate Total):					950	345	1,200	2,536	CONT.	CONT.
Subtotal Contracts:					3,950	3,345	2,700	4,836	CONT.	CONT.

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DATE: February 1998

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

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205633N

PROJECT NUMBER: W1355

PROGRAM ELEMENT TITLE: AVIATION IMPROVEMENTS

PROJECT TITLE: AIRCRAFT ENGINE CIP

	<u>FY 1996</u> <u>&amp; Prior</u>	<u>FY 1997</u> <u>Actual</u>	<u>FY 1998</u> <u>Budget</u>	<u>FY 1999</u> <u>Budget</u>	<u>To</u> <u>Complete</u>	<u>Total</u> <u>Program</u>
All other in-house test and evaluation under \$1.0M (Aggregate Total):						
VARIOUS      VARIOUS      10/97      CONT.      CONT.	744	714	656	770	CONT.	CONT.
Subtotal Lab\Activity\Other:	744	714	656	770	CONT.	CONT.
Total Test and Evaluation	4,694	4,059	3,356	5,606	CONT.	CONT.
Support and Management	332	620	845	950	CONT.	CONT.
	<u>FY 1996</u> <u>&amp; Prior</u>	<u>FY 1997</u> <u>Actual</u>	<u>FY 1998</u> <u>Budget</u>	<u>FY 1999</u> <u>Budget</u>	<u>To</u> <u>Complete</u>	<u>Total</u> <u>Program</u>
Subtotal Product Development	112,914	34,544	32,283	41,846	CONT.	CONT.
Subtotal Test & Evaluation	4,694	4,059	3,356	5,606	CONT.	CONT.
Subtotal Support and Management	332	620	845	950	CONT.	CONT.
Total Project	117,940	39,223	36,484	48,402	CONT.	CONT.

C. (U) Not required.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 07

PROGRAM ELEMENT: 0205667N

PROJECT NUMBER: E1408

PROGRAM ELEMENT TITLE: F-14 Upgrade

PROJECT TITLE: F-14 Upgrade

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
E1408 F-14 UPGRADE	9,377	11,289	12,947	1,415	1,475	1,552	1,648	0	1,835,230

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This program element provides for the development of improvements to the Navy F-14 squadrons in order to counter the projected threat through the year 2000 and beyond. The F-14D has increased capability in three major areas: new engine, new digital avionics, and upgraded radar. These changes yield significant improvements in capability and performance, as well as reliability and maintainability, and will facilitate the total integration and exploitation of related programs i.e., Joint Tactical Information Distribution System (JTIDS), Infrared Search and Track System (IRST), and inclusion of Airborne Self-Protection Jammer (ASPJ) in the electronic warfare (EW) suite for the F-14D operational evaluation. A Pre-deployment Update (PDU) program (primarily software) includes air-to-ground ordnance delivery capability, full Link 16 capability, and radar/Electronic Counter-Countermeasures (ECCM) improvements for the F-14D. The PDU program was created because of concurrent development of the F-14D and the above listed common avionics and weapons. It implements the capabilities inherent in systems incorporated during the full scale development (FSD) program and is a planned integral part of the evolution of the F-14D aircraft. F-14 weapons integration supports integration of EW improvements and correction of OPEVAL deficiencies. Funding is also provided for various software upgrades such as Global Positioning System, and accommodates the realignment of Aviation Depot Level Repairables (AVDLR) from Major Range and Test Facility Bases to direct project funding.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it encompasses engineering and manufacturing development for upgrade of existing, operational systems.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

(U) (\$9,377) Continued development and test of third PDU tape.

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

DATE: February 1998

BUDGET ACTIVITY: 07

PROGRAM ELEMENT: 0205667N

PROJECT NUMBER: E1408

PROGRAM ELEMENT TITLE: F-14 Upgrade

PROJECT TITLE: F-14 Upgrade

2. (U) FY 1998 PLAN:  
(U) (\$11,289) Continue development and test of third PDU tape.
3. (U) FY 1999 PLAN:  
(U) (\$12,947) Continue development and test of third PDU tape.

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	9,437	11,704	14,839
(U) Appropriated Value:			
(U) Adjustments from President's Budget:	-60	-415	-1,892
(U) FY 1999 President's Budget	9,377	11,289	12,947

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding:

(U) The net adjustment of -\$60 thousand in FY 1997 is comprised of -\$48 thousand for Small Business Innovation Research assessment and -\$12 thousand for an economic adjustment.

The FY 1998 net decrease is the result of -\$68 thousand for Contract Advisory and Assistance Services; and -\$347 thousand for various Congressional adjustments.

The FY 1999 net decrease consists of +\$355 thousand pricing adjustment; -\$2,000 thousand for restoral of Common Support Aircraft; -\$228 thousand various inflation adjustments; and -\$19 thousand for reprogramming adjustment.

(U) Schedule: (U) Tape D03B is now in FY 2000.

(U) Technical: N/A

NOTE: Slip in Tape D03B from FY 99 to FY 00 is due to \$2M mark for "Restoral of Common Support Aircraft". Tape D03A has not slipped.

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

DATE: February 1998

BUDGET ACTIVITY: 07

PROGRAM ELEMENT: 0205667N  
PROGRAM ELEMENT TITLE: F-14 Upgrade

PROJECT NUMBER: E1408  
PROJECT TITLE: F-14 Upgrade

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

	<u>FY 1997</u> <u>ACTUAL</u>	<u>FY 1998</u> <u>ESTIMATE</u>	<u>FY 1999</u> <u>ESTIMATE</u>	<u>FY 2000</u> <u>ESTIMATE</u>	<u>FY 2001</u> <u>ESTIMATE</u>	<u>FY 2002</u> <u>ESTIMATE</u>	<u>FY 2003</u> <u>ESTIMATE</u>	<u>TO</u> <u>COMPLETE</u>	<u>TOTAL</u> <u>PROGRAM</u>
APN-5 F-14 (B.A. 5) Line 18	226,467	279,624	223,661	84,009	9,243	27,016	21,536	20,279	891,835

(U) RELATED RDT&E:

- (U) PE 0205604N (Tactical Data Links)
- (U) PE 0604270N (EW Development)

D. (U) SCHEDULE PROFILE:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>TO COMPLETE</u>
Program Milestones				
Engineering Milestones				
T&E Milestones	3Q/97 - 1Q/98			1Q/00 - 2Q/00
	OT-III(Tape 3A)			OT-III(Tape 3B)
Contract Milestones				

**R-1 Item No. 167**  
**UNCLASSIFIED**

**UNCLASSIFIED**

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

DATE: February 1998

BUDGET ACTIVITY: 07

PROGRAM ELEMENT: 0205667N

PROJECT NUMBER: E1408

PROGRAM ELEMENT TITLE: F-14 Upgrade

PROJECT TITLE: F-14 Upgrade

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

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. PDU Software Development	9,077	10,989	12,647
b. PDU Systems Engineering/Test and Evaluation	300	300	300
c. Digital Flight Control System Flight Tests	0	0	0
Total	9,377	11,289	12,947

**R-1 Item No. 167**  
**UNCLASSIFIED**

**Exhibit R-3, RDT&E Program Element/Project Cost Breakdown**  
**(Exhibit R-3, Page 4 of 6 pages)**

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

DATE: February 1998

BUDGET ACTIVITY: 07

PROGRAM ELEMENT: 0205667N

PROJECT NUMBER: E1408

PROGRAM ELEMENT TITLE: F-14 Upgrade

PROJECT TITLE: F-14 Upgrade

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

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development:										
CONTRACTS										
Northrop/Grumman, Bethpage, NY										
AMRAAM Int.	SS/CPFF	6/94	9,924	9,924	9,924	0	0	0	0	9,924
BLK I/JDAM	SS/CPFF	8/94	6,506	6,506	6,506	0	0	0	0	6,506
FSD Cont	SS/FFP	8/84	994,378	994,378	994,378	0	0	0	0	994,378
Miscellaneous			3,154	3,154	2,100	1,054	0	0	0	3,154
INHOUSE										
NAVAIRWARCENWPNDIV Pt Mugu, CA										
PDU	WX	10/98	220,705	220,705	190,433	7,368	10,657	12,247	0	220,705
Miscellaneous			26,844	26,844	24,948	805	547	544	0	26,844
AVDLR			6,090	6,090	0	0	0	0	6,090	6,090
Support and Management:										
various	WX	10/98	1,437	1,437	1,046	150	85	156	0	1,437
Test and Evaluation:										
COMOPTEVFOR PD		6/95	3,760	3,760	3,760	0	0	0	0	3,760

**R-1 Item No. 167  
UNCLASSIFIED**

**Exhibit R-3, RDT&E Program Element/Project Cost Breakdown  
(Exhibit R-3, Page 5 of 6 pages)**

**UNCLASSIFIED**

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

DATE: February 1998

BUDGET ACTIVITY: 07

PROGRAM ELEMENT: 0205667N

PROJECT NUMBER: E1408

PROGRAM ELEMENT TITLE: F-14 Upgrade

PROJECT TITLE: F-14 Upgrade

GOVERNMENT FURNISHED PROPERTY

Item Description	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Delivery Date	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development REPAIR OF REPAIRABLES	MP	VARIOUS	VARIOUS	11,078	0	0	0	0	11,078

Support and Management: Not Applicable.

Test and Evaluation: Not Applicable.

Subtotal Product Development				1,239,367	9,227	11,204	12,791	6,090	1,278,679
Subtotal Support and Management				1,046	150	85	156	0	1,437
Subtotal Test and Evaluation				3,760	0	0	0	0	3,760
Other FY 1995 & Prior costs				551,354	0	0	0	0	551,354
Total Project				1,795,527	9,377	11,289	12,947	6,090	1,835,230

**R-1 Item No. 167  
UNCLASSIFIED**

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



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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)								DATE February 1998	
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0206313M Marine Corps Communications Systems					
COST (In Thousands)	FY 1997 Actual	FY 1998 Estimate	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	53960	40840	50594	51333	35728	26927	24704	Continuing	Continuing
C2270 Command Post Systems	10367	7067	9778	10430	5732	5075	3282	Continuing	Continuing
C2271 Maneuver C2 Systems	6015	1413	2090	1834	442	0	0	0	11794
C2272 Intelligence C2 Systems	3504	2975	3507	3951	4056	4156	4271	Continuing	Continuing
C2273 Air Operations C2 Systems	7474	5135	6366	6277	2677	1328	1370	Continuing	Continuing
C2274 C2 Warfare Systems	3937	3275	4007	3865	3321	3853	4575	Continuing	Continuing
C2275 Radio Systems	365	4949	2950	5094	2343	725	723	Continuing	Continuing
C2276 Communications Switching and Control System	3288	1959	2106	1746	1836	0	0	0	10935
C2277 Systems Engineering and Integration	15002	189	6500	5716	2940	2931	2920	Continuing	Continuing
C2278 Air Defense Weapons Systems	787	793	2006	847	869	892	914	Continuing	Continuing
C2315 Training Devices/Simulators	3221	8233	9933	10180	10073	6484	5117	Continuing	Continuing
C2317 ASCIET	0	0	1351	1393	1439	1483	1532	Continuing	Continuing
C2500 Close Range UAV Data Links	0	4852	0	0	0	0	0	0	4852
Quantity of RDT&E Articles									
<p><b>(U) Mission Description and Budget Item Justification:</b> This program element provides funding to develop the command and control (C2) support and information infrastructures for the Fleet Marine Force and supporting establishment. Doctrinally, the C2 support system and the information infrastructure form two parts of a triad of capabilities which permits command and control systems to be transformed into a complete operating system. The third element of the triad is command and control organization and is not covered in this program element. USMC command and control is divided into six functional areas and one supporting functional area as follows:</p>									

<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)</b>		DATE <b>February 1998</b>
BUDGET ACTIVITY <b>7 - Operational System Development</b>	PE NUMBER AND TITLE <b>0206313M Marine Corps Communications Systems</b>	
<p>maneuver C2, intelligence C2, fire support C2, air operations C2, combat service support C2, command and control warfare C2, and C2 support (information processing and communications). Within this program element, subprojects have been grouped by C2 functional area for more efficient planning. Air defense weapons systems have been added to facilitate planning and a separate project is used for systems assigned to the supporting establishment. Subprojects which support the commander's decision processes have been collected into the Command Post Systems project since these systems must work in close cooperation to ensure effective C2 of Marine Air Ground Task Forces.</p> <p>(U) <b>Justification for Budget Activity:</b> This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it encompasses engineering and manufacturing development for upgrade of existing, operational systems.</p>		
<i>Page 169 - 2 of 169 - 75 Pages</i>		Exhibit R-2

**UNCLASSIFIED**

<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)</b>							DATE <b>February 1998</b>			
BUDGET ACTIVITY <b>7 - Operational System Development</b>				PE NUMBER AND TITLE <b>0206313M Marine Corps Communications Systems</b>				PROJECT <b>C2270</b>		
COST <i>(In Thousands)</i>	FY 1997 Actual	FY 1998 Estimate	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	Cost to Complete	Total Cost	
C2270 Command Post Systems	10367	7067	9778	10430	5732	5075	3282	Continuing	Continuing	
Quantity of RDT&E Articles										
<p><b>A. (U) <u>Mission Description and Budget Item Justification:</u></b> Systems assigned to this project are to be used by commanders and their staffs to process, fuse, and tailor information to assist decision-making and enhance situational awareness. They will integrate and share information from sources both internal and external to the Marine Air-Ground Task Force (MAGTF) to provide a shared understanding of the battlespace. Decision support integrates information from the seven Command and Control (C2) functional areas and the support function. The information is tailored to support the users' specific needs. As a result of the MAGTF C4I Baseline subproject, an integrated migration strategy is being incorporated into the MAGTF software baseline which will be common across and used by all MAGTF C4I programs. The Tactical Command Operations (TCO) will provide systems to the command post which support Maneuver C2. Maneuver C2 is the executive layer of decision support that pulls and fuses information from other functional areas. The Intelligence Analysis Systems (IAS) supports the employment of reconnaissance, surveillance, and target acquisition resources and the timely planning and processing of all-source intelligence; it ensures that tactical intelligence is tailored to meet specific mission requirements. A Marine Expeditionary Force (MEF) IAS variant will also process signals intelligence. Advanced Field Artillery Tactical Data Systems (AFATDS) will consist of fire support command and control software fielded on Marine Corps common hardware. AFATDS will provide the MAGTF with an automated ability to rapidly integrate, all supporting arm assets into maneuver plans. The Advanced Tactical Air Command Center (ATACC) functions as the operational command post of the MAGTF ACE. It provides automated assistance for planning and executing tactical air operations, and provides voice and data interface with joint and combined Air C2 agencies. The Improved Direct Air Support Center (IDASC) links information and systems needed to conduct Air Operations C2 with Maneuver C2 of the ground combat element of the MAGTF. The Phase I ATACC was fielded 1st Qtr FY96. This project develops and transitions two Command and Control Imperative ATDs (the Expeditionary Integrated Combat Operations Center (EICOC) and the Joint Tactical Communications (JT COMMs) ATDs) into various Marine Corps and Joint Engineering and Manufacturing Development (E&amp;MD) efforts. EICOC development efforts focus on: Cognitive Task Analysis (CTA); enhanced ergonomic physical design; evaluation of advanced multimedia hardware; integration and networking with advanced development communication systems; and advanced software development to support systems integration and advanced battlefield visualization concepts. EICOC developments are tailored to support transition of software and hardware developments as PIPs to the established MAGTF C4I baseline. EICOC is the interim name for the Unit Ops Center (UOC). The UOC name will replace the EICOC name starting with FY00.</p>										
Project C2270			Page 169 - 3 of 169 - 75 Pages				Exhibit R-2			

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<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)</b>		DATE <b>February 1998</b>
<b>BUDGET ACTIVITY</b> <b>7 - Operational System Development</b>	<b>PE NUMBER AND TITLE</b> <b>0206313M Marine Corps Communications Systems</b>	<b>PROJECT</b> <b>C2270</b>
<b>PROGRAM ACCOMPLISHMENTS AND PLANS:</b>		
<b>(U) FY 1997 Accomplishments:</b>		
• (U) \$	177	TCO: Continued automatic relay and message routing.
• (U) \$	393	TCO: Completed Phase II Operational Requirements Document (ORD) requirements and began incorporating Phase III requirements.
• (U) \$	90	TCO: Completed LINK-11 Radar-To-Computer software and OTH Gold message format.
• (U) \$	447	IAS: Initiated investigation of hardware engineering change proposals (ECP's) for MEF IAS, IAS Suites, and IAS Workstations.
• (U) \$	383	IAS: Initiated incorporation and testing of new standard software applications. Achieved MSIII.
• (U) \$	100	IAS: Initiated interoperability testing and updated documentation.
• (U) \$	250	IAS: Conducted IAS Workstation (Battalion/Squadron) development.
• (U) \$	245	IAS: Initiated program management for Integrated Logistics Support and Systems Engineering..
• (U) \$	1117	IAS: Initiated interoperability and compatibility standards listed in the ORD).
• (U) \$	126	IDASC: Completed DASC Phase I Auto Request. Continued to work on DASC Phase II software Block upgrade requirement including follow-on effort to complete tailoring software for one hardware platform. Upgraded software will provide seamless automation with other USMC Aviation Command and Control agencies.
• (U) \$	137	IDASC: Initiated introduction of new technology into existing system baseline and investigated hardware engineering change proposals for installing technology upgrades.
• (U) \$	101	IDASC: Updated and completed data packages/training manuals, developmental testing, and software documentation.
• (U) \$	366	MAGTF C4I BASELINE: Continue software development directly related to the transition and conversion of C4I TCO system requirements into the Joint Maritime Command Information Strategy (JMCIS)/Defense Information Infrastructure (DII) Common Operating Environment (COE) in support of the MAGTF C4I Baseline effort.
• (U) \$	204	MAGTF C4I Baseline: Continue software integration of TCO system requirements to the MSBL.
• (U) \$	136	MAGTF C4I Baseline: Continue developmental and battle lab testing of TCO system requirement to the MSBL.
• (U) \$	1535	ATACC: Initiated and completed the evaluation of USAF Multi-Source Correlation System.
• (U) \$	153	ATACC: Initiated S/W development efforts and completed efforts for the ATACC program.
• (U) \$	305	ATACC: Initiated and completed ILS documentation, provided program management support, and related travel costs.
• (U) \$	490	ATACC: Conduct study for the development of the Contingency Theater Automated Planning Systems (CTAPS) and the Theater Battle Management Core System(TBMCS) which is the follow on to CTAPS.
• (U) \$	259	ATACC: Initiated study for the development of Meshnet Marine Air C2 Common Voice Communication Subsystem.
• (U) \$	755	AFATDS: Continued developmental and interoperability efforts with the Army on AFATDS 97 software. This effort will include migration to the DII COE and adding additional fire support functionality.
Project C2270	Page 169 - 4 of 169 - 75 Pages	Exhibit R-2

**UNCLASSIFIED**

<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)</b>		DATE <b>February 1998</b>
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
<b>7 - Operational System Development</b>	<b>0206313M Marine Corps Communications Systems</b>	<b>C2270</b>
<ul style="list-style-type: none"> <li>• (U) \$ 1129 AFATDS: Prepared "MEF SLICE" test-bed unit and conducted the AFATDS 97 Multi-service Operational Test and Evaluation (MOTE). This effort will include hardware fielding, operator training, and unit/Command Post Exercise (CPX) training.</li> <li>• (U) \$ 240 AFATDS: Initiated developmental effort to identify a smaller computer for the Marine Corps.</li> <li>• (U) \$ 1229 Forward finance efforts in this project and program elements for the IAS, IDASC, TCO and AFATDS programs.</li> </ul>		
(U)Total \$ 10,367		
<b>(U) FY 1998 Planned Program:</b>		
• (U) \$ 200	TCO: Complete Phase III ORD requirements.	
• (U) \$ 0	TCO: Complete Phase III ORD requirements. (This effort forwarded financed with \$400 FY97 funds.)	
• (U) \$ 134	TCO: Initiate the integration of software and hardware changes into existing system and perform testing.	
• (U) \$ 581	TCO: Initiate the incorporation of Phase IV ORD requirements.	
• (U) \$ 70	TCO: Complete automatic relay message routing.	
• (U) \$ 194	IAS: Continue testing of new standard software applications.	
• (U) \$ 50	IAS: Continue interoperability testing with system hardware and software modifications.	
• (U) \$ 80	IAS: Initiate and test prototype IAS Workstations.	
• (U) \$ 0	IAS: Initiate and test prototype IAS Workstations. This effort financed with \$117K of FY 97 funds.	
• (U) \$ 289	IDASC: Investigate hardware ECPs for the HMD DASC system for improved digital communications capabilities and for computer hardware upgrades	
• (U) \$ 0	IDASC: Investigation hardware ECPs for the HMD DASC system for improved digital communications capabilities and for computer hardware upgrades. This effort financed with \$100K of FY 97 funds.	
• (U) \$ 229	IDASC: Incorporate and test new standard software applications which will allow automated communication between the DASC and the fire support coordination center.	
• (U) \$ 60	IDASC: Conduct interoperability testing with system modifications to ensure that incorporated modifications will allow automated communications between USMC and joint command and control systems.	
• (U) \$ 363	IAS MOD: Initiate hardware ECPs for MEF IAS and IAS suites.	
• (U) \$ 150	IAS MOD: Follow-on testing of ECPs and program management support.	
• (U) \$ 975	MAGTF C4I Baseline: Continue software development of the MSBL developed to the DII COE . Includes enhanced open system, distributed directory services, distributed file service and enhanced security.	
• (U) \$ 608	MAGTF C4I Baseline: Continue software integration to the MSBL.	
• (U) \$ 405	MAGTF C4I Baseline: Continue developmental and battle lab testing of MSBL.	
• (U) \$ 319	EICOC: Begin investigating GOTS/COTS software/hardware to support automation of Command Post Systems.	
• (U) \$ 414	EICOC: Integration efforts of GOTS/COTS software/hardware into the Command Post System.	
Project C2270	Page 169 - 5 of 169 - 75 Pages	Exhibit R-2

**UNCLASSIFIED**

<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)</b>		DATE <b>February 1998</b>
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
<b>7 - Operational System Development</b>	<b>0206313M Marine Corps Communications Systems</b>	<b>C2270</b>
<ul style="list-style-type: none"> <li>• (U) \$ 255 EICOC: Begin developmental testing of Command Post System.</li> <li>• (U) \$ 1558 AFATDS: Continue developmental and interoperability efforts with the Army on AFATDS 98 software. This effort will include migration to the DII COE, adding additional fire support functionality, continuing work on identifying a smaller computer for the USMC, preparing test units for a Multi-Service Limited Users Test of AFATDS 98, and in obtaining a Procurement Decision. Achieve MSIII.</li> <li>• (U) \$ 0 AFATDS: Continue developmental and interoperability efforts with the Army on AFATDS 98 software. This effort will include migration to the DII COE, adding additional fire support functionality, continuing work on identifying a smaller computer for the USMC, preparing test units for a Multi-Service Limited Users Test of AFATDS 98, and in obtaining a Procurement Decision. This effort financed with \$612K of FY97 funds.</li> <li>• (U) \$ 133 SBIR: Portion of program reserved for Small Business Innovation Research assessment in accordance with 15 U.S.C. 638 (f) (1).</li> </ul>	(U)Total \$ 7067	
<b>(U) FY 1999 Planned Program:</b>		
<ul style="list-style-type: none"> <li>• (U) \$ 755 TCO: Initiate investigation of hardware ECP for TCO systems.</li> <li>• (U) \$ 413 TCO: Complete Phase IV ORD requirements.</li> <li>• (U) \$ 230 TCO: Integrate software and hardware changes into existing systems and perform testing.</li> <li>• (U) \$ 278 IAS: Continue testing new standard software applications into existing system.</li> <li>• (U) \$ 462 IAS: Continue interoperability testing with system hardware and software modifications. Investigate and develop computer based training. Achieve MS III.</li> <li>• (U) \$ 397 IDASC: Investigate hardware ECPs for the HMD DASC system for migration towards a common USMC Aviation Comand and Control Communications System.</li> <li>• (U) \$ 242 IDASC: Continue testing new standard software applications. Continue interoperability testing with system modifications.</li> <li>• (U) \$ 250 IAS MOD: Continue investigation of hardware ECPs for MEF IAS and IAS Suites.</li> <li>• (U) \$ 168 IAS MOD: Continue program management for testing of ECPs.</li> <li>• (U) \$ 930 MAGTF C4I BASELINE: Continue software development of the MSBL developed to the (DIICOE). Includes enhanced open system, distributed directory services, distributed file service, and enhanced security.</li> <li>• (U) \$ 558 MAGTF C4I BASELINE: Continue software integration to the MSBL.</li> <li>• (U) \$ 374 MAGTF C4I BASELINE: Continue developmental and battle lab testing of the MSBL.</li> <li>• (U) \$ 836 MAGTF C4I BASELINE: Initiate the integration (system level) of Enhanced Position Location Reporting System (EPLRS) with MAGTF C4I tactical data systems.</li> <li>• (U) \$ 245 MAGTF C4I BASELINE: Initiate the integration (network level) and fusion of EPLRS and MAGTF C4I tactical data systems into a seamless and integrated data network that provides command, control, and situational awareness data connectivity</li> <li>• (U) \$ 375 EICOC: Continue investigating GOTS/COTS software/hardware to support automation of Command Post Systems.</li> </ul>		
Project C2270	Page 169 - 6 of 169 - 75 Pages	Exhibit R-2

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<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)</b>							DATE <b>February 1998</b>					
<b>BUDGET ACTIVITY</b> <b>7 - Operational System Development</b>				<b>PE NUMBER AND TITLE</b> <b>0206313M Marine Corps Communications Systems</b>			<b>PROJECT</b> <b>C2270</b>					
<ul style="list-style-type: none"> <li>• (U) \$ 540 EICOC: Continue integration efforts of GOTS/COTS software/hardware into the Command Post Systems.</li> <li>• (U) \$ 313 EICOC: Continue developmental testing of Command Post System.</li> <li>• (U) \$ 2412 AFATDS: Continue developmental and interoperability efforts with the Army on AFATDS 98 software. This effort will include migration to the DII COE), adding additional fire support functionality, continuing work on identifying a smaller computer for the USMC, preparing test units for a Multi-Service Limited Users Test of AFATDS 98, and in obtaining a Procurement Decision.</li> </ul> <p>(U)Total \$ 9,778</p>												
<b>B. (U) <u>Project Change Summary</u></b>				<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>						
(U) Previous President's Budget				12194	5260	6954						
(U) Adjustments to Previous President's Budget				-1827	+1807	+2824						
(U) Current Budget Submit				10367	7067	9778						
 (U) Change Summary Explanation:												
(U) Funding: FY97: Funding changes due to minor affordability adjustments.												
Funding: FY98: Funding changes due to minor affordability adjustments.												
Funding: FY99: Funding changes due to minor affordability adjustments.												
(U) Schedule: Not Applicable												
 (U) Technical: Not Applicable												
<b>C. (U) <u>Other Program Funding Summary</u></b>				<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>To</u>	<u>Total</u>
<b>(APPN, BLI #, NOMEN)</b>											<u>Compl</u>	<u>Cost</u>
(U) PMC BLI# 463100 TCO				6673	9268	1583	1063	888	649	643	CONT	CONT
(U) PMC BLI# 474700 IAS				6880	9767	10363	0	0	0	0	0	27964
(U) PMC BLI# 474700 IAS (TCAC)				10707	0	0	0	0	0	0	0	10707
(U) PMC BLI# 463600 IDASC				4084	1365	1406	1549	1588	1519	1564	CONT	CONT
(U) PMC BLI# 474900 IAS MOD				4615	1383	1663	1645	1606	1787	1828	CONT	CONT
(U) PMC BLI# 463100 AFATDS				0	0	3576	16413	16330	10682	0	0	47001
(U) TCO (O&MMC)				110	447	508	522	538	554	570	CONT	CONT
(U) MEF IAS (O&MMC)				40	1266	2273	1973	1941	1945	2032	CONT	CONT
(U) IDASC (O&MMC)				0	187	144	148	152	155	160	CONT	CONT
(U) AFATDS (O&MMC)				18	0	343	370	393	406	420	CONT	CONT
Project C2270				Page 169 - 7 of 169 - 75 Pages				Exhibit R-2				

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE
BUDGET ACTIVITY <b>7 - Operational System Development</b>	PE NUMBER AND TITLE <b>0206313M Marine Corps Communications Systems</b>	<b>February 1998</b> PROJECT <b>C2270</b>
<p>(U) <b>Related RDT&amp;E</b></p> <p>(U) PE 0301301L (Department of Defense Intelligence and Information Systems/Military Intelligence Integrated Data System/Integrated Data Base I and II) (Defense Intelligence Agency).</p> <p>(U) Navy Tactical Flag Communication and Control System.</p> <p>(U) PE 0206313M, Marine Corps Communications Systems Command/Control.</p>		
Project C2270	Page 169 - 8 of 169 - 75 Pages	Exhibit R-2

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**RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)**

DATE **February 1998**

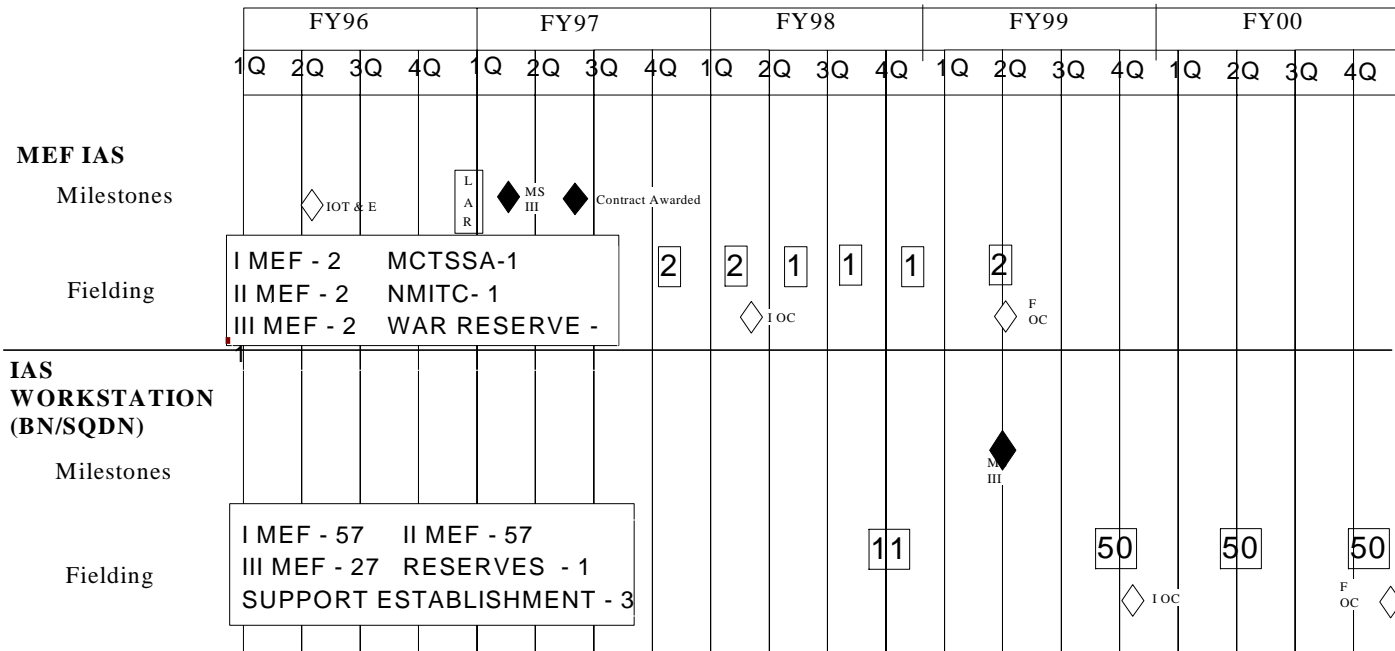
BUDGET ACTIVITY  
**7 - Operational System Development**

PE NUMBER AND TITLE  
**0206313M Marine Corps Communications Systems**

PROJECT  
**C2270**

**D. (U) Schedule Profile**

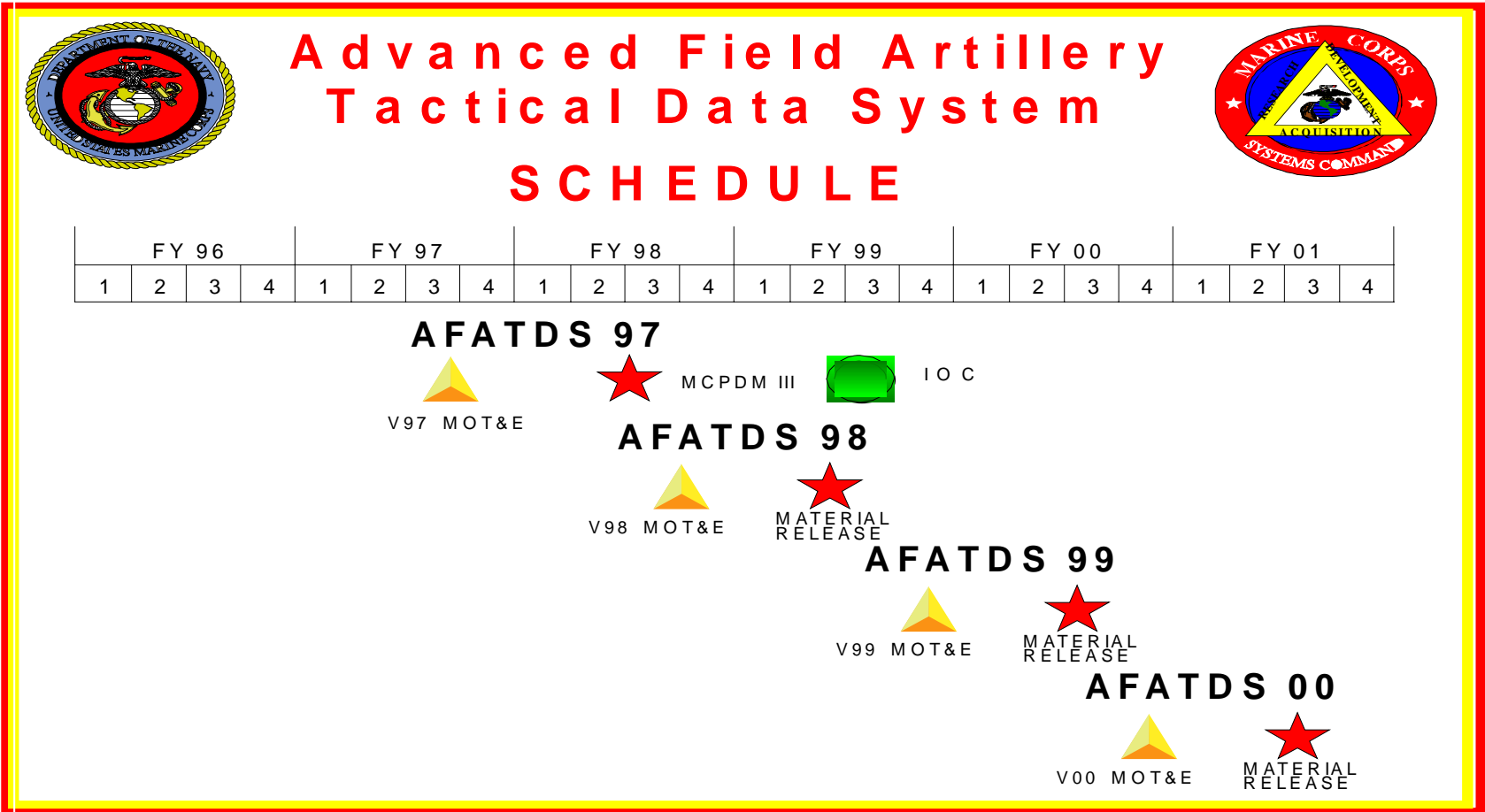
**IAS Program**



Now At:



<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)</b>		DATE <b>February 1998</b>
BUDGET ACTIVITY <b>7 - Operational System Development</b>	PE NUMBER AND TITLE <b>0206313M Marine Corps Communications Systems</b>	PROJECT <b>C2270</b>



UNCLASSIFIED

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 1998				
BUDGET ACTIVITY <b>7 - Operational System Development</b>				PE NUMBER AND TITLE <b>0206313M Marine Corps Communications Systems</b>				PROJECT <b>C2270</b>			
A. <u>(U) Project Cost Breakdown</u>				<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>					
Primary HW/SW Development				7891	4734	7261					
Development Test and Evaluation				1377	1673	1896					
Program Management Support				1099	527	621					
SBIR Tax					133						
Total				10367	7067	9778					
<b>B. <u>Budget Acquisition History and Planning Information</u></b>											
<b>Performing Organizations</b>											
Contractor or Government	Contract Method/Type	Award or Obligation	Performing Activity	Project Office	Total Prior to					Budget to Complete	Total Program
Performing <u>Activity</u>	or Funding <u>Vehicle</u>	<u>Date</u>	<u>EAC</u>	<u>EAC</u>	<u>FY 1997</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>			
<b>Product Development Organizations</b>											
<b>TCO:</b>	WR	Oct 96			0	270	648	970		CONT	CONT
MCTSSA, Camp Pendleton, CA											
<b>Forward Finance</b>	WR	Oct 97	400	400	0	400	0	0		0	400
NISE EAST											
	WR	Oct 96			0	75	72	102		CONT	CONT
Charleston, SC											
NISMC, Wash. D.C.	C/RCP	Oct 96	21	21	0	21	0	0		0	21
Project C2270				Page 169 - 11 of 169 - 75 Pages				Exhibit R-3			

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE
										February 1998
BUDGET ACTIVITY					PE NUMBER AND TITLE					PROJECT
<b>7 - Operational System Development</b>					<b>0206313M Marine Corps Communications Systems</b>					<b>C2270</b>
<b>IAS:</b>	C/RCP	Feb 97	754	754	0	354	44	0	450	754
NAWC, Pt. Mugu, CA										
CECOM, Ft. Monmouth, NJ	C/MIPR	Nov 96	66	66	0	165	0	0	0	66
NSWC, Crane, IN	C/RCP	Nov 96			0	300	0	400	CONT	CONT
NAWC, Pt. Mugu, CA	C/RCP	Nov 96	250	250	0	348	0	0	0	250
<b>IAS MOD:</b>	C/RCP	Dec 97			0	0	413	343	CONT	CONT
NSWC, Crane, IN										
<b>IDASC:</b>	WR	Oct 96			0	156	237	273	CONT	CONT
NSWC, Crane, IN										
MCTSSA, Camp Pendleton, CA	WR	Oct 96				126	229	242	CONT	CONT
<b>Forward Finance</b>	WR	Oct 97	100	100	0	100	0	0	0	100
<b>ATACC:</b>	C/RCP	May 97	1535	1535	0	1535	0	0	0	1535
Warner Robbins AFB, GA										
SALC, McClellan AFB, CA	C/RCP	May 97	430	430	0	330	0	0	0	430
NSWC, Crane, IN	WR	Sep 97	150	150	0	150	0	0	0	150
Mctssa, Camp Pendleton, CA	WR	Sep 97	400	400	0	300	0	0	0	400
<b>MAGTF C4I</b>	WR	Nov 98			0	0	748	1260	CONT	CONT
<b>Baseline:</b>										
MCTSSA, Camp Pendleton, CA										
SPAWAR, San Diego, CA	C/PFF/RCP	Mar 97			0	525	785	1259	CONT	CONT
CECOM, Fort Monmouth, NJ.	WR	Oct 98			0	0	0	0	CONT	CONT
NRAD, San Diego	WR	Oct 98			0	0	0	0	CONT	CONT

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE
										February 1998
BUDGET ACTIVITY					PE NUMBER AND TITLE					PROJECT
<b>7 - Operational System Development</b>					<b>0206313M Marine Corps Communications Systems</b>					<b>C2270</b>
NISE EAST, St. Inigoes, MD	WR	Oct 98	2662	2662	0	0	0	0	1816	2662
<b>AFATDS:</b> USA, Ft. Sill, OK	CPFF/MIPR	Jan 97			0	1884	1458	2252	3382	9506
<b>Forward Finance</b> MCSC, Quantico, VA	CPFF/MIPR	Oct 97	612	612	0	612	0	0	0	612
	CPFF/RCP	Jun 97			0	240	100	160	CONT	CONT
<b>Support and Management Organizations</b>										
<b>TCO:</b> MCTSSA, Camp Pendleton, CA	WR	Oct 96			0	119	97	136	CONT	CONT
NAWC, Pt. Mugu, CA	CPFF/RCP	Apr 97			0	100	0	0	CONT	CONT
NISMC, Washington, DC	CPFF/RCP	Sep 97	21	21	0	21	0	0	0.	21
MCSC, Quantico, VA	CPFF/RCP	TBD			0	0	88	125	CONT	CONT
<b>IAS:</b> Vanguard, Dumfries, VA	C/PFF/RCP	Oct 96	195	195	0	195	0	0	0	195
MCSC, Quantico, VA	WR	Oct 96	10	10	0	10	0	0	0	10
CSC, Dumfries, VA	C/PFF/RCP	Jun 97	100	100	0	100	0	0	0	100
<b>IDASC:</b> MCSC, Quantico, VA	WR	Oct 96			0	82	112	124	CONT	CONT
<b>MAGTF C4I</b> <b>Baseline:</b> Vanguard, Dumfries, VA	C/PFF/RCP	Jun 97	45	45.	0	45	50	50	0.	45
SPAWAR, Crystal City, VA	C/PFF/RCP	Mar 97	435	435	0	0	0	0	0.	435
TBN	C/PFF/RCP	Nov 98			0	0	0	0	CONT	CONT

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1998	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0206313M Marine Corps Communications Systems					PROJECT C2270	
<b>EICOC:</b>	CPFF/RCP	TBD			0	0	180	186	CONT	CONT	
MCSC, Quantico, VA											
<b>ATACC:</b>	WR	Oct 96	153	153	0	103	0	0	0	153	
MCTSSA, Camp Pendleton, CA											
<b>MCSC, Quantico, VA</b>	WR	Oct 96	145	145	0	100	0	0	0	145	
<b>MCSC, Quantico, VA</b>	RCP	May 97	270	270	0	224	0	0	0	270	
<b>Test and Evaluation Organizations</b>											
<b>TCO:</b>	WR	Oct 96			0	54	80	65	CONT	CONT	
MCTSSA, Camp Pendleton, CA											
<b>IAS:</b>	C/MIPR	Jul 97			0	932	50	75	CONT	CONT	
ARL, Adelphi, MD											
<b>Forward Finance</b>		Oct 97	117	117	0	117	0	0	0	117	
<b>MCTSSA, Camp Pendleton, CA</b>	C/RCP/WR	Sep 96			0	61	230	225	CONT	CONT	
<b>JITC, Ft. Huachuca, AZ</b>	C/MIPR	Sep 97			0	37	0	40	CONT	CONT	
<b>ESC, Hanscom, MA</b>	C/MIPR	Sep 97	40	40	0	40	0	0	0	40	
<b>IAS MOD:</b>	C/MIPR	TBD	350	350	0	0	100	75	175	350	
ARL, Adelphi, MD											
<b>MAGTF C4I</b>	WR	Oct 97			0	0	203	187	CONT	CONT	
<b>Baseline:</b>											
MCTSSA, Camp Pendleton, CA											
<b>SPAWAR, Crystal City, VA/ San Diego, CA</b>	CPFF/RCP	Mar 97	136	136	0	136	202	187	0	136	

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1998	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0206313M Marine Corps Communications Systems					PROJECT C2270	
<b>EICOC:</b>	WR	Oct 97	4697	4697	0	0	808	1042	CONT	CONT	
MCTSSA, Camp Pendleton, CA											
<b>SBIR Tax</b>	Various	Various	0	0	0	0	133	0	133	133	
					Total Prior to <u>FY 1997</u>		<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	Budget to <u>Complete</u>	Total <u>Program</u>
Subtotal Product Development						7891	4734	7261	CONT	CONT	
Subtotal Support and Management						1099	527	621	CONT	CONT	
Subtotal Test and Evaluation						1377	1806	1896	CONT	CONT	
Total Project						10367	7067	9778	CONT	CONT	
 <b>C. (U) <u>Funding Profile:</u> Not Applicable.</b>											

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<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)</b>							DATE <b>February 1998</b>		
BUDGET ACTIVITY <b>7 - Operational System Development</b>				PE NUMBER AND TITLE <b>0206313M Marine Corps Communications Systems</b>				PROJECT <b>C2271</b>	
COST <i>(In Thousands)</i>	FY 1997 Actual	FY 1998 Estimate	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	Cost to Complete	Total Cost
C2271 Maneuver C2 Systems	6015	1413	2090	1834	442	0	0	0	11794
Quantity of RDT&E Articles									

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

(U) Maneuver C2 is the executive layer of decision support that retrieves and fuses information from the functional areas. It provides an integrated representation of the battlespace or a specific area of concern. The subprojects below develop systems which report unit status and location to the Tactical Combat Operations (TCO) and Advanced Tactical Air Command Central (ATACC). They also disseminate maneuver information throughout the battlespace. The Joint Tactical Information Distribution System (JTIDS) provides unit location and status in near-real-time, primarily for aircraft, ships, and air defense systems. The Data Automated Communications Terminal (DACT) input/output battlefield situational awareness system and communication terminal handles positions and messaging information for company-sized units and below.

**PROGRAM ACCOMPLISHMENTS AND PLANS**

**(U) FY 1997 Accomplishments:**

- (U) \$ 582 DACT: Initiated positional, navigational, and Variable Message Format (VMF) application software.
- (U) \$ 552 DACT: Conducted research on developing hardware, Global Positioning System (GPS), and mapping technologies
- (U) \$ 104 DACT: Prepared and executed source selection of hardware platform.
- (U) \$ 293 JTIDS: Provided engineering support for the Class 2/2H Terminals which will be used in JTIDS common processor.
- (U) \$ 256 JTIDS: Initiated JTIDS participation in Defense Information Infrastructure(DII) Common Operating Environment(COE) working group.
- (U) \$ 4206 JTIDS: Completed Engineering Change Proposal (ECPs) to AN/TYQ JTIDS for TAOM integration.
- (U) \$ 22 JTIDS: Program management support for various technical interchange meetings, demonstrations and conferences.

(U)Total \$ 6,015

**(U) FY 1998 Planned Program:**

- (U) \$ 400 DACT: Continue software and hardware development for Phase I system.
- (U) \$ 449 DACT: Continue software and hardware integration efforts.
- (U) \$ 105 DACT: Perform developmental and operational testing on DACT system.
- (U) \$ 50 JTIDS: Continue support for the Joint JTIDS Link 16 IPT.

Project C2271 Page 169 - 16 of 169 - 75 Pages Exhibit R-2



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<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)</b>							DATE <b>February 1998</b>			
<b>BUDGET ACTIVITY</b> <b>7 - Operational System Development</b>				<b>PE NUMBER AND TITLE</b> <b>0206313M Marine Corps Communications Systems</b>			<b>PROJECT</b> <b>C2271</b>			
<ul style="list-style-type: none"> <li>• (U) \$ 100 JTIDS: Continue JTIDS participation in DII COE working group.</li> <li>• (U) \$ 270 JTIDS: Initiate and develop the interface TYQ-JTIDS to other Aviation C2 Agencies..</li> <li>• (U) \$ 20 JTIDS: Program management support for various technical interchange meetings, demonstrations, and conferences.</li> <li>• (U) \$ 19 SBIR: Portion of program reserved for Small Business Innovation Research assessment in accordance with 15 U.S.C. 638 (f) (1).</li> </ul> <p>(U)Total \$ 1,413</p> <p><b>(U) FY 1999 Planned Program:</b></p> <ul style="list-style-type: none"> <li>• (U) \$ 702 DACT: Begin Phase II software development.</li> <li>• (U) \$ 80 DACT: Perform regression and software support testing on Phase II software.</li> <li>• (U) \$ 50 JTIDS: Continue engineering support for the Class 2/2H Terminals which will be used in JTIDS common processor.</li> <li>• (U) \$ 488 JTIDS: Complete ECP to AN/TYQ JTIDS for TACC operations.</li> <li>• (U) \$ 750 JTIDS: Commence integration of real time/non-real time data feeds to AN/TYQ JTIDS.</li> <li>• (U) \$ 20 JTIDS: Program management support for various technical interchange meetings, demonstrations and conferences.</li> </ul> <p>(U)Total \$ 2,090</p>										
<b>B. (U) <u>Project Change Summary</u></b>										
		<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>						
(U) Previous President's Budget		4139	1469	2121						
(U) Adjustments to Previous President's Budget		+1876	-56	-31						
(U) Current Budget Submit		6015	1413	2090						
 (U) Change Summary Explanation:										
(U) Funding: FY97: Changes in funding due to minor affordability adjustments and internal reprogramming.										
FY98: Changes in funding due to minor affordability adjustments.										
FY99: Changes in funding due to minor affordability adjustments.										
(U) Schedule: Not applicable.										
 (U) Technical: Not applicable.										
 <b>C. (U) <u>Other Program Funding Summary</u></b>										
		<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	To	Total
									<u>Compl</u>	<u>Cost</u>
(U) PMC, BLI #463200, DACT		5568	620	12755	19883	11998	4941	8557	TBD	TBD
Project C2271		Page 169 - 17 of 169 - 75 Pages							Exhibit R-2	

**RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)**

DATE **February 1998**

BUDGET ACTIVITY  
**7 - Operational System Development**

PE NUMBER AND TITLE  
**0206313M Marine Corps Communications Systems**

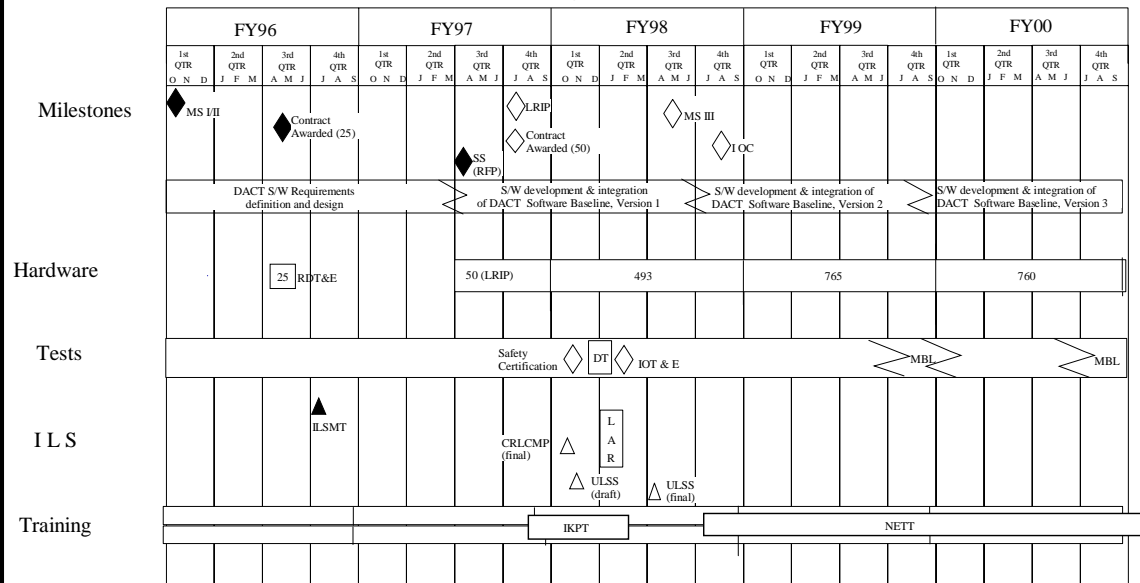
PROJECT  
**C2271**

C. (U) <u>Other Program Funding Summary</u> (APPN, BLI #, NOMEN)	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	To Compl	Total Cost
(U) O&M, DACT	0	98	399	411	423	302	199	TBD	TBD
(U) PMC, BLI #463200, JTIDS	1165	7196	6552	6987	7861	997	1026	TBD	TBD
(U) O&M, JTIDS	0	0	0	0	0	0	0	0	0

(U) **Related RDT&E**

**D. (U) Schedule Profile**

DACT Program Structure



**RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)**

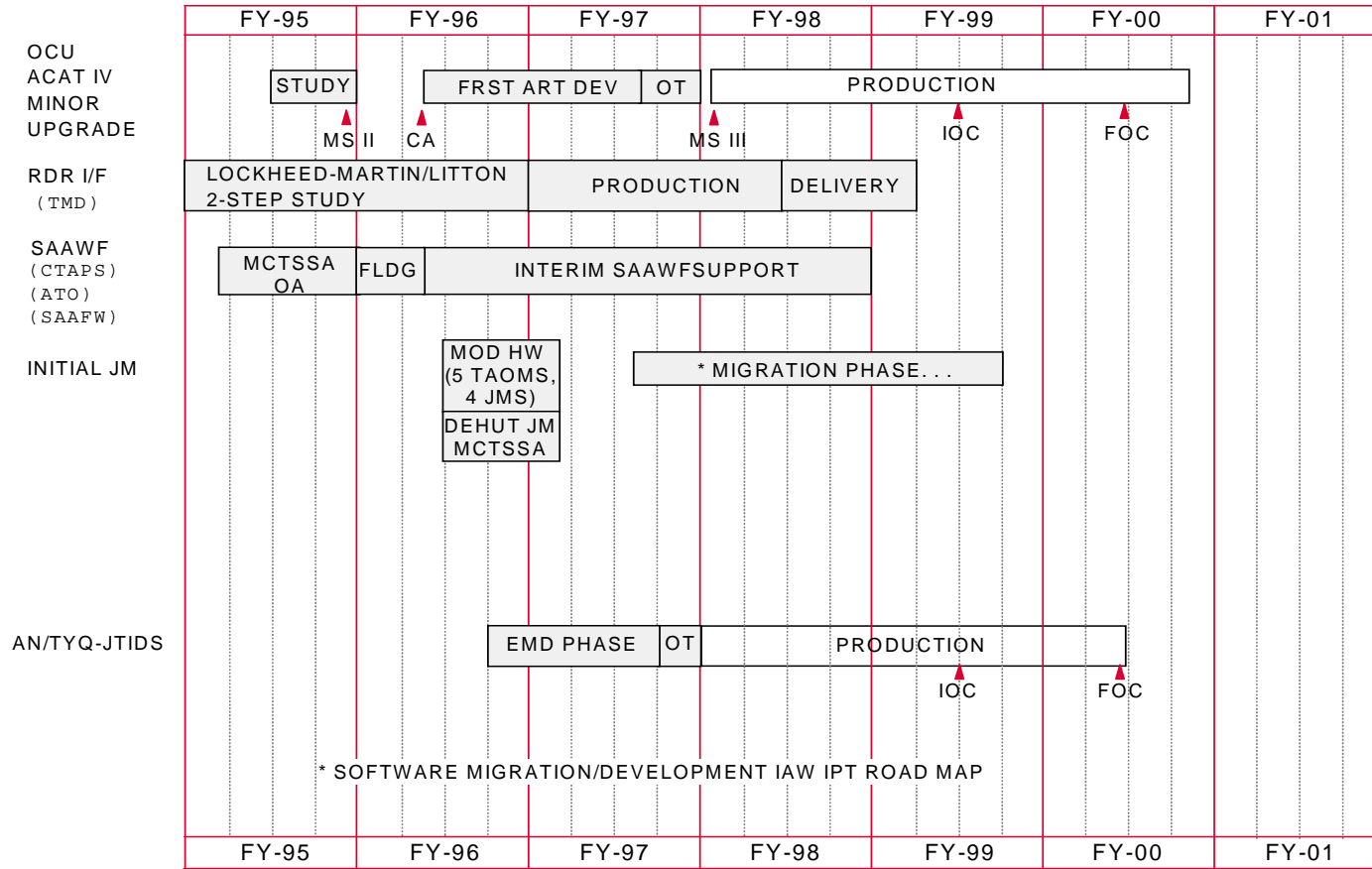
DATE **February 1998**

BUDGET ACTIVITY  
**7 - Operational System Development**

PE NUMBER AND TITLE  
**0206313M Marine Corps Communications Systems**

PROJECT  
**C2271**

**JTIDS**



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<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)</b>							DATE <b>February 1998</b>			
BUDGET ACTIVITY <b>7 - Operational System Development</b>				PE NUMBER AND TITLE <b>0206313M Marine Corps Communications Systems</b>				PROJECT <b>C2272</b>		
COST <i>(In Thousands)</i>	FY 1997 Actual	FY 1998 Estimate	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	Cost to Complete	Total Cost	
C2272 Intelligence C2 Systems	3504	2975	3507	3951	4056	4156	4271	Continuing	Continuing	
Quantity of RDT&E Articles										
<p><b>A. (U) <u>Mission Description and Budget Item Justification:</u></b> Intelligence Command and Control (C2) supports the employment of reconnaissance, surveillance, and target acquisition resources and the timely planning and processing of all-source intelligence. It ensures that all-source tactical intelligence is tailored to meet specific mission requirements. The systems below collect raw intelligence data on the battlefield, convert raw intelligence data into processed information and deliver the processed products to the Intelligence Analysis Systems (IAS) for analysis. The Secondary Imagery Distribution System (SIDS) is used to distribute processed imagery throughout the Marine Corps Communications Systems. The Tactical Remote Sensor System (TRSS) includes deployable unattended ground sensors, a receiver system to collect signals from the sensors, a processing system to analyze the sensed data, and a communications capability to deliver the processed intelligence to the IAS system. Tactical Exploitation of National Capabilities (TENCAP) is a program designed to enhance the ability of tactical Marine Corps forces to exploit the capabilities of national intelligence-gathering systems. Congressionally directed, it requires close liaison with the intelligence community and involves complex and highly-sensitive activities. Commander's Tactical Terminal (CTT) is a special application ultra high frequency satellite communications (UHF SATCOM) receiver which provides dissemination of intelligence broadcast networks and near-real-time tactical intelligence and targeting information.</p> <p><b>(U) FY 1997 Accomplishments:</b></p> <ul style="list-style-type: none"> <li>• (U) \$ 50 SIDS: Prepared research, development and testing documentation to be used for the milestone III/fielding decision.</li> <li>• (U) \$ 72 SIDS: Developed modifications to Commercial-off-the-shelf (COTS) Scuba Dive-Bags to satisfy Operational Requirements Documents(ORD)requirements for submarine Out-Station entrance, submarine extraction, and use in the surf zone.</li> <li>• (U) \$ 338 TRSS: Completed Software Development for the Improved Air-Delivered Sensor (IADS), TRSS MAGTF C4I segment, and stored data retrieval software.</li> <li>• (U) \$ 711 TENCAP: Participated in National Intelligence Systems Data (NISD) integration to support the expansion of the direct downlink capability to provide additional signals intelligence (SIGINT) and imagery products building upon MIDAS (classified) and Radiant Mercury in support of broader applications within the Aviation Combat Element (ACE) of the MAGTF.</li> <li>• (U) \$ 409 TENCAP: Participated in Real Time In the Cockpit (RTIC) project to explore the technical feasibility and tactical utility of national systems data directly to Marine Corps aircraft for targeting, situational awareness, and threat avoidance to determine most effective support within the ACE of the MAGTF.</li> </ul>										
Project C2272			Page 169 - 20 of 169 - 75 Pages				Exhibit R-2			

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE
BUDGET ACTIVITY <b>7 - Operational System Development</b>		February 1998
PE NUMBER AND TITLE <b>0206313M Marine Corps Communications Systems</b>		PROJECT <b>C2272</b>
<ul style="list-style-type: none"> <li>• (U) \$ 550 TENCAP: Participated in Laptop Imagery/Tactical Transmission via Low-Rate Electronics (LITTLE), a tactical imagery dissemination project to support the down-sizing of various modems used in the tactical environment to a personal computer memory card interface association (PCMCIA). Once downsized, these modems will support the transfer of imagery and other intelligence-related information to the digital automated communications terminal (DACT).</li> <li>• (U) \$ 285 TENCAP: Evaluated RADIANT CLEAR Phase II project which will develop tactically useful exploitation algorithms to develop national imagery products in support of littoral warfare.</li> <li>• (U) \$ 220 TENCAP: Assisted in the integration of RADIANT TIN imagery compression software within the manpack SIDS to enhance the capability of transferring imagery via low data rate tactical communications.</li> <li>• (U) \$ 160 TENCAP: Continued to support TENCAP training and education efforts by providing various TENCAP simulation, scripting, and processing hardware, software and exercise support to training centers and Fleet units deployed and in garrison.</li> <li>• (U) \$ 102 TENCAP: Continued participation in NISD, evaluate the utility of emerging exploitation, automated and manual target recognition and detection tools, and emerging reconnaissance technologies. Formulate and submit Tactical Impact Statements (TIS) as required by Congress.</li> <li>• (U) \$ 115 CTT: Final program support on CTT documentation.</li> <li>• (U) \$ 492 CTT: Engineering Support for CTT and JTT.</li> <li>(U)Total \$ 3,504</li> </ul>		
<b>(U) FY 1998 Planned Program:</b>		
<ul style="list-style-type: none"> <li>• (U) \$ 53 SIDS: Complete modification of the COTS Scuba Dive-Bags.</li> <li>• (U) \$ 1631 TENCAP: Conduct advance technology demonstrations and integration into the established MAGTF C4I architecture.</li> <li>• (U) \$ 420 TENCAP: Conduct technical assessments of emerging national data dissemination capabilities.</li> <li>• (U) \$ 372 TENCAP: Continue to support operational planning to enhance operating force capabilities to US national intelligence data within the MAGTF C4I architecture.</li> <li>• (U) \$ 380 TENCAP: Evaluate the utility of emerging exploitation, automated and manual target recognition and detection tools.</li> <li>• (U) \$ 100 TENCAP: Continue TENCAP training and education efforts by providing the Fleet Marine Force (FMF) with various TENCAP simulation, scripting, and processing hardware and software support.</li> <li>• (U) \$ 19 SBIR: Portion of program reserved for Small Business Innovation Research assessment in accordance with 15 U.S.C. 638 (f)(1).</li> <li>(U)Total \$ 2,975</li> </ul>		
<b>(U) FY 1999 Planned Program:</b>		
<ul style="list-style-type: none"> <li>• (U) \$ 205 SIDS: Complete software upgrade to maintain NITFS standards and improve compression algorithms.</li> <li>• (U) \$ 1910 TENCAP: Continue advance technology demonstrations and integration into the established MAGTF C4I architecture.</li> <li>• (U) \$ 367 TENCAP: Continue technical assessments of emerging national data dissemination capabilities.</li> </ul>		
Project C2272	Page 169 - 21 of 169 - 75 Pages	Exhibit R-2

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<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)</b>							DATE <b>February 1998</b>				
<b>BUDGET ACTIVITY</b> <b>7 - Operational System Development</b>				<b>PE NUMBER AND TITLE</b> <b>0206313M Marine Corps Communications Systems</b>			<b>PROJECT</b> <b>C2272</b>				
<ul style="list-style-type: none"> <li>• (U) \$ 475 TENCAP: Continue to support operational planning to enhance operating force capabilities to US national intelligence data within the MAGTF C4I architecture.</li> <li>• (U) \$ 450 TENCAP: Continue to evaluate the utility of emerging exploitation, automated and manual target recognition and detection tools.</li> <li>• (U) \$ 100 TENCAP: Continue TENCAP training and education efforts by providing the Fleet Marine Force with various TENCAP simulation, scripting, and processing hardware and software support.</li> </ul> <p>(U)Total \$ 3,507</p>											
<b>B. (U) <u>Project Change Summary</u></b>				<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>					
(U) Previous President's Budget				3978	3357	3576					
(U) Adjustments to Previous President's Budget				-474	-382	-69					
(U) Current Budget Submit				3504	2975	3507					
(U) Change Summary Explanation:											
(U) Funding: Adjustment in FY 97 is due to minor affordability adjustments. Adjustment in FY 98 and FY98 are due to minor affordability adjustments.											
(U) Technical: CTT will not intergrate with TERPES in FY97, TERPES will receive a JTT vice a CTT.											
<b>C. (U) <u>Other Program Funding Summary</u></b>			<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>To</u>	<u>Total</u>
<b>(APPN, BLI #, NOMEN)</b>											
(U) PMC BLI 474700 Intelligence Support Equipment											
SIDS			6855	3177	0	0	0	0	0	0	10,032
CTT			958	2585	0	0	0	0	0	0	3,543
(U) PMC Line BLI 474900 Modification Kits Intelligence											
TRSS			317	0	0	0	0	0	0	0	317
(U) O&M,MC											
TRSS			154	397	751	771	792	807	835	CONT	CONT
SIDS			362	400	435	331	351	479	468	CONT	CONT
<b>(U) Related RDT&amp;E</b>											
Project C2272			Page 169 - 23 of 169 - 75 Pages						Exhibit R-2		

DATE  
**February 1998**

BUDGET ACTIVITY  
**7 - Operational System Development**

PE NUMBER AND TITLE  
**0206313M Marine Corps Communications  
Systems**

(U) PE 0301301L (Department of Defense Intelligence and Information Systems/Military Intelligence Integrated Data System/Integrated Data Base I and II)  
(DefenseIntelligence Agency)

(U) PE 0604270A (Intelligence and Electronic Warfare Common Sensor (IEWCS), TACJAM-A)

(U) PE 0305885G (Tactical Cryptologic Program)

(U) PE 0603730A (Tactical Surveillance System - Advanced Development), Army TENCAP, Project D560(U)PE 0603766A (Tactical Electronic Surveillance System -  
Advance Development), Army TENCAP, Project D907

(U) PE 0604740A (Tactical Surveillance System - Engineering Development), OSD TENCAP, Project D662

(U) PE 0902398M (United States Special Operations Command), Chariot Program

(U) PE 0605867N (SEW Surveillance/Reconnaissance Support), Project Z1034

<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)</b>	DATE <b>February 1998</b>
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BUDGET ACTIVITY <b>7 - Operational System Development</b>	PE NUMBER AND TITLE <b>0206313M Marine Corps Communications Systems</b>	PROJECT <b>C2272</b>
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**D. (U) Schedule Profile:**

SECONDARY IMAGERY DISSEMINATION SYSTEM  
 SIDS THERM IMAGER MILESTONE SCHEDULE  
 PE NO: 0206313M  
 PROJECT NO: C2272

PROGRAM MILESTONES	FY97	FY98	FY99	FY00	FY01	FY02	FY03
PROGRAM MILESTONES	2NDQTR MSIII	IOC 3QTR FOC 4THQTR					
ENGINEERING MILESTONES							
T&E MILESTONES							
CONTRACT MILESTONES							



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<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)</b>	DATE <b>February 1998</b>
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BUDGET ACTIVITY <b>7 - Operational System Development</b>	PE NUMBER AND TITLE <b>0206313M Marine Corps Communications Systems</b>	PROJECT <b>C2272</b>
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MILESTONE SCHEDULE  
 PROJECT TITLE: INTELLIGENCE BROADCAST RECEIVER (IBR)  
 PE NO.: 206313M  
 PROJECT NO.: C2272B

	FY 96	FY97	FY98	FY99	FY00	FY01	FY02	FY03
PROGRAM MILESTONES	Procurement Decision (CTT3) 2ND QTR	Procurement Decision (IBR) 2nd QTR						
ENGINEERING MILESTONES								
T & E MILESTONES								
CONTRACT MILESTONES	LRIP Contract (CTT3) 1ST QTR		JTT Contract (JTT) 1st QTR					

\* MS III per lead service (U.S. Army)

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 1998			
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0206313M Marine Corps Communications Systems			PROJECT C2272			
<b>A. (U) Project Cost Breakdown</b>				<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>				
a. Program Management Support				115	0	0				
b. Engineering Support				421	0	126				
c. TENCAP Concept Development/Feasibility Demonstration				1348	1777	2475				
d. TENCAP Training/Exercise Support to FMF				160	100	100				
e. System Design/Integration/Development				700	53	536				
f. Management Support Services				360	518					
g. Software Development					508	270				
h. Primary Hardware Development				400						
i. SBIR				0	19	0				
Total				3504	2975	3507				
<b>B. Budget Acquisition History and Planning Information</b>										
<b>Performing Organizations</b>										
Contractor or Government	Contract Method/Type	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1997	FY 1997	FY 1998	FY 1999	Budget to Complete	Total Program
<b>Product Development Organizations</b>										
TENCAP	RCP	Jan 97			0	2392	2304	2849	CONT	CONT
MarCorSysCom, Quantico, VA										
<b>Support and Management Organizations</b>										
CTT										
SYSCOM	WR	Oct 96	40	40	0	40	0	0	0	40
Vanguard	RCP	Jan 97	75	75	0	75	0	0	0	75
Dumfries, VA										
BTG, INC	RCP	Mar 97	433	433	0	421	0	0	0	433
Fairfax, VA										
TENCAP	Various	Jan 97			0	435	618	453	CONT	CONT
Project C2272										
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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE
										February 1998
BUDGET ACTIVITY					PE NUMBER AND TITLE					PROJECT
<b>7 - Operational System Development</b>					<b>0206313M Marine Corps Communications Systems</b>					<b>C2272</b>
SBIR	Various	Various	19	19	0	19	0	0	0	19
<b>Test and Evaluation Organizations</b>										
SIDS										
NAWC, PT Mugu	WR	Dec 96	384	384	0	122	53	205	0	384
					Total				Budget to	Total
					Prior to				Complete	Program
					<u>FY 1997</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>		
Subtotal Product Development						2392	2304	2849	CONT	CONT
Subtotal Support and Management						990	618	453	CONT	CONT
Subtotal Test and Evaluation						122	53	205	0	380
Total Project						3504	2975	3507	CONT	CONT
 <b>C. (U) <u>Funding Profile:</u> Not Applicable.</b>										

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<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)</b>							DATE <b>February 1998</b>			
BUDGET ACTIVITY <b>7 - Operational System Development</b>				PE NUMBER AND TITLE <b>0206313M Marine Corps Communications Systems</b>				PROJECT <b>C2273</b>		
COST <i>(In Thousands)</i>	FY 1997 Actual	FY 1998 Estimate	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	Cost to Complete	Total Cost	
C2273 Air Operations C2 Systems	7474	5135	6366	6277	2677	1328	1370	Continuing	Continuing	
Quantity of RDT&E Articles										
<p><b>A. (U) <u>Mission Description and Budget Item Justification:</u></b> Air Operations C2 coordinates and plans Navy and Marine air combat operations and interfaces with joint and combined forces air operations. It also interfaces with fire support C2. The systems in this project are used to detect aircraft and missiles, process the detected information, deliver the processed information to the Advanced Tactical Air Command Central (ATACC), and conduct the air battle. The Tactical Air Operations Module (TAOM) improves the current system; the TAOM is the center for directing aircraft and anti-air systems in real time as part of the joint air battle. The Air Defense Communications Platform (ADCP) provides an interface between the AN/TPS-59 (V)3 radar and the HAWK missile system for tactical ballistic missile defense as a JTIDS network user, the ADCP provides a direct interface between the AN/TPS-59 (v)3 and the joint services. Aviation radars are used to detect the location and identity of aircraft and missiles in the battle area. Contingency Theater Automated Planning System (CTAPS) is a system which provides the Commander the automated tools necessary to generate disseminate and execute the Air Tasking Order (ATO). It is an evolutionary acquisition allowing for the rapid development of software/hardware to meet today's rapidly advancing technology. The Common Aviation Command and Control System (CAC2S) will provide a common baseline of equipment, computer hardware, and software required to perform the mission of the Marine Air Command and Control System (MACCS). CAC2S will assimilate the missions and fiscal resources of the Tactical Air Operations Center (TAOM), Tactical Air Command Center and the Direct Air Support Center (DASC) and the Air Defense Communications Platform (ADCP).</p> <p><b>PROGRAM ACCOMPLISHMENTS AND PLANS</b></p> <p><b>(U) FY 1997 Accomplishments:</b></p> <ul style="list-style-type: none"> <li>• (U) \$ 806 ADCP: Achieved MS III decision. Continued software enhancement to meet mature ADCP Operational Requirements Document (ORD) requirements.</li> <li>• (U) \$ 3849 TAOM: Completed Engineering Manufacturing Development (EMD) effort of Joint Tactical Information Distribution System (JTIDS) and development of TAOM/JTIDS interface.</li> <li>• (U) \$ 627 TAOM: Began development of Defense Information Infrastructure (DII) Common Operating Environment (COE) Tactical Air Data Information Link-Joint (TADIL-J) Common Segment.</li> <li>• (U) \$ 448 TAOM: Continued closed system (AYK-14) to open system migration.</li> <li>• (U) \$ 1214 TAOM: Program support, which consists of contractor support to provide documentation, hardware/software engineering, and logistics analysis to the program office; support of operational testing, In Process Review (IPR), and contract management.</li> </ul>										
Project C2273			Page 169 - 28 of 169 - 75 Pages				Exhibit R-2			

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<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)</b>		DATE <b>February 1998</b>
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
<b>7 - Operational System Development</b>	<b>0206313M Marine Corps Communications Systems</b>	<b>C2273</b>
<ul style="list-style-type: none"> <li>• (U) \$ 281 AV RDR: Continued development of updated threat analyses. Analyze/incorporate recommended changes in accordance with Advanced Change Study Notices, and implement engineering change proposals (ECPs) for AN/TPS-59 radar Product Improvement Program.</li> <li>• (U) \$ 10 AV RDR: Continued reliability analysis and analysis of field identified deficiencies to Aviation Radars.</li> <li>• (U) \$ 10 AV RDR: Conducted/coordinated Life Cycle Management and Logistics Support Analysis.</li> <li>• (U) \$ 229 AV RDR: FY 1997 forward finances efforts in this PE and project.</li> </ul>		
(U)Total \$ 7474		
<b>(U) FY 1998 Planned Program:</b>		
<ul style="list-style-type: none"> <li>• (U) \$ 212 ADCP: Execute a comprehensive plan to prepare and test the ADCP for JTIDS joint certification.</li> <li>• (U) \$ 200 TAOM: Complete development of DII COE TADIL J Common Segment in preparation for MS III award during 1<sup>st</sup> qtr FY98.</li> <li>• (U) \$ 414 TAOM: Continue closed system (AYK-14) to open system migration.</li> <li>• (U) \$ 384 TAOM: Begin Theater Ballistic Missile Defense (TBMD) implementation into the TAOM.</li> <li>• (U) \$ 350 TAOM: Program support, which consists of contractor support to provide documentation, hardware/software engineering, and logistics analysis to the program office; support of developmental testing, IPR, and contract management.</li> <li>• (U) \$ 2781 AV RDR: Analyze and develop ECP's to increase AN/TPS-59 radar detection and targeting capability within the Antenna Array Transmitters and Receivers.</li> <li>• (U) \$ 250 AV RDR: Fund Marine Corps Tactical Software Support Activity (MCTSSA) Software Support.</li> <li>• (U) \$ 411 AV RDR: Program support, which consists of contractor support to provide documentation, hardware/software engineering, and logistics analysis to the program office; support of operational testing. In Process Review (IPR), and contract management.</li> <li>• (U) \$ 0 AV RDR: Analyze and develop ECP-s to increase AN/TPS-59 radar detection and targeting capability within the Antenna Arry Transmitters and Receivers. This effort forward finance with \$229K FY97 funds from this PE and Project.</li> <li>• (U) \$ 133 SBIR: Portion of program reserved for Small Business Innovation Research assessment in accordance with 15 U.S.C. 638 (f) (1).</li> </ul>		
(U)Total \$ 5,135		
<b>(U) FY 1999 Planned Program:</b>		
<ul style="list-style-type: none"> <li>• (U) \$ 215 ADCP: Continue software enhancements concentrating on expanding the JTIDS message set.</li> <li>• (U) \$ 507 TAOM: Continue closed system (AYK-14) to open system migration.</li> <li>• (U) \$ 476 TAOM: Continue TMD implementation into the TAOC.</li> <li>• (U) \$ 128 TAOM: Program support, which consists of contractor support to provide documentation, hardware/software engineering, and logistics analysis to the program office; support of operational testing, IPR, and contract management.</li> <li>• (U) \$ 275 TAOM: Begin enhancements to TAOM voice gateway.</li> <li>• (U) \$ 63 AV RDR: Continue MCTSSA software support.</li> </ul>		
Project C2273	Page 169 - 29 of 169 - 75 Pages	Exhibit R-2

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)							DATE February 1998		
BUDGET ACTIVITY	PE NUMBER AND TITLE						PROJECT		
<b>7 - Operational System Development</b>	<b>0206313M Marine Corps Communications Systems</b>						<b>C2273</b>		
<ul style="list-style-type: none"> <li>• (U) \$ 97 CTAPS: Initiate USMC'S management of Theater Battle Management Core System (TBMCS) 1.0 development</li> <li>• (U) \$ 112 AV RDR: Program support, which consists of contractor support to provide documentation, hardware/software engineering, and logistics analysis to the program office; support of developmental testing IPR, and contract management.</li> <li>• (U) \$ 500 CAC2S: Initiate and complete engineering studies.</li> <li>• (U) \$ 2431 CAC2S: Initiate the migration of existing equipment to a prototype CAC2S suite of equipment.</li> <li>• (U) \$ 1000 CAC2S: Conduct exercises with prototype equipment to determine optimum equipment mix and organization.</li> <li>• (U) \$ 562 AV RDR: Complete design, build prototype interface and test antenna array upgrades.</li> <li>(U)Total \$ 6366</li> </ul>									
<b>B. (U) <u>Project Change Summary</u></b>									
	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>						
(U) Previous President's Budget	6,972	5,328	2,369						
(U) Adjustments to Previous President's Budget	+502	-193	+3997						
(U) Current Budget Submit	7,474	5,135	6,366						
(U) Change Summary Explanation:									
<ul style="list-style-type: none"> <li>(U) Funding: FY 1997 changes due to minor affordability adjustments.</li> <li>Funding: FY 1998 changes due to minor affordability adjustments.</li> <li>Funding: FY 1999 changes due to minor affordability adjustments and \$4000 for PR99 adjustment for CAC2S.</li> </ul>									
(U) Schedule: Not Applicable									
(U) Technical: Not applicable									
<b>C. (U) <u>Other Program Funding Summary</u></b>									
	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>To</u>	<u>Total</u>
								<u>Compl</u>	<u>Cost</u>
(U) PMC, BLI#464000, TAOM/CTAPS	8,500	9,108	11,505	3,013	5,500	2,587	5,047	CONT	CONT
(U) PMC, BLI#463700, ADCP	0	55	2,110	868	274	137	61	CONT	CONT
(U) PMC, BLI#463600, TPS-59 RADAR	38,711	5,796	8,354	7,824	9,520	0	0	0	70,205
(U) O&M, TAOM	0	0	0	0	0	0	0	0	0
(U) O&M, ADCP	0	375	361	0	0	0	0	0	405
(U) O&M, AN/TPS-59	0	0	0	0	0	0	0	0	0
<b>(U) Related RDT&amp;E</b>									
Project C2273									
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Exhibit R-2									

**RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)**

DATE **February 1998**

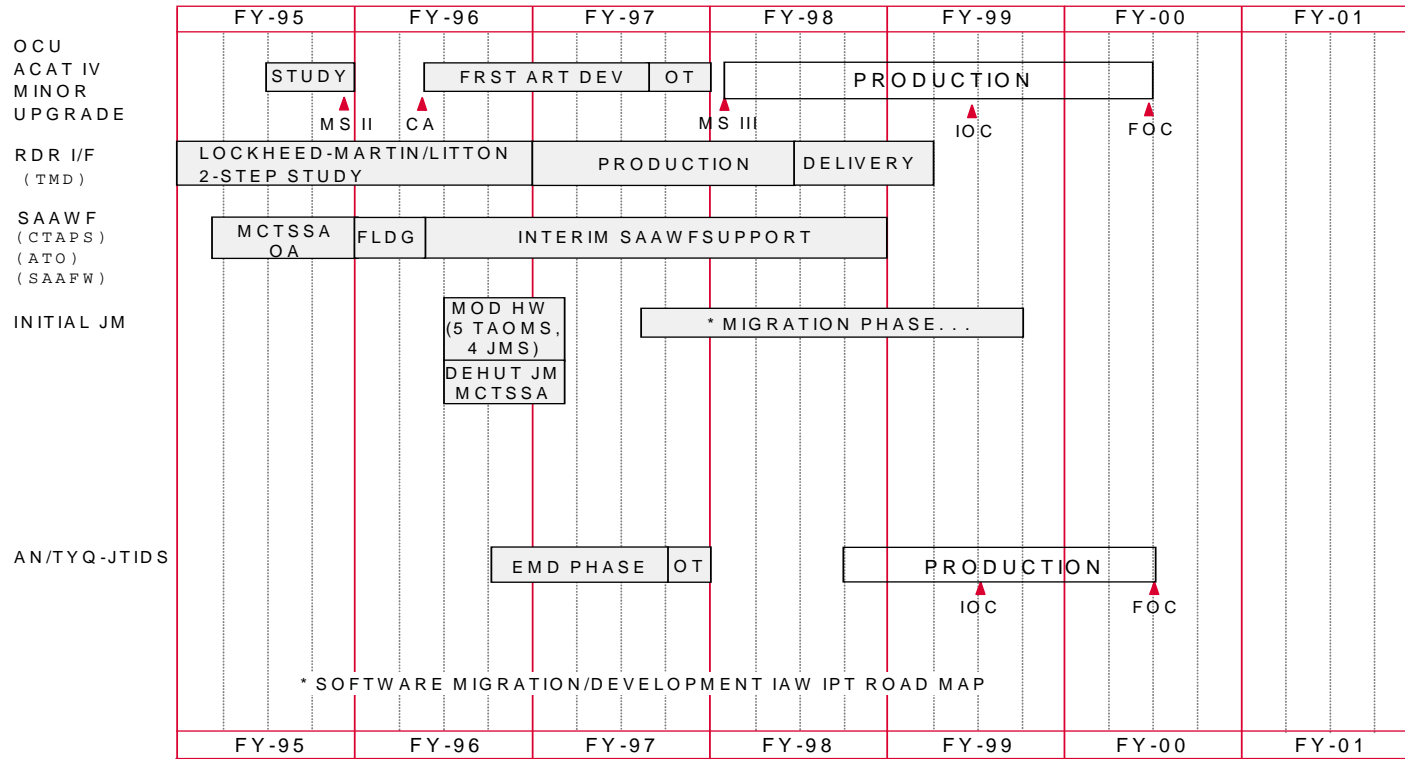
BUDGET ACTIVITY  
**7 - Operational System Development**

PE NUMBER AND TITLE  
**0206313M Marine Corps Communications Systems**

PROJECT  
**C2273**

PE 0603216C (Ballistic Missile Defense Organization, Theater Missile Defense)

**D. (U) TAOM Milestone Schedule Profile**



**RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)**

DATE **February 1998**

BUDGET ACTIVITY  
**7 - Operational System Development**

PE NUMBER AND TITLE  
**0206313M Marine Corps Communications Systems**

PROJECT  
**C2273**

ADCP MILESTONE

	FY 95	FY 96	FY 97	FY 98	FY 99
SOFTWARE DEVELOPMENT	 CDR 4/95			ADCP/FDOC SW & H/W Integration	
			TJ UPDATES		
MILESTONES	MS I/II  2/95		LAR  11/96	MS III  4/97	
TESTING		DT  GAT	DEMO /OT T-J Test		TJ CERT 10/98
HARDWARE/ PRODUCTION	CDR  3/95		PCA  3/97	PRODUCTION	
PRODUCTION SCHEDULE				 2	 2
TBM VARIANT				 IOC	 FOC



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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 1998			
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0206313M Marine Corps Communications Systems				PROJECT C2273	
<b>A. (U) Project Cost Breakdown</b>					<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>			
Software Development					1,242	1,113	1,357			
Configuration Management					4410	0	0			
Development Support Equipment Acquisition					600	0	0			
Systems Engineering					0	3,128	1,087			
Developmental Test and Evaluation					0	0	1000			
Prototype Hardware Development					0	0	2,500			
Program Management Support					1,222	761	422			
SBIR Tax					0	133	0			
Total					7,474	5,135	6,366			
<b>B. Budget Acquisition History and Planning Information</b>										
<b>Performing Organizations</b>										
Contractor or Government	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1997	FY 1997	FY 1998	FY 1999	Budget to Complete	Total Program
<b>Product Development Organizations</b>										
Litton Data Systems Augora Hills, CA	SS/CPAF/RCP	Mar 97			0	3,849	1,158	1125	CONT	CONT
MCTSSA, Camp Pendleton, CA	WR	Jun 97	500	500	0	500	0	0	0	500
MCTSSA, Camp Pendleton, CA	CPFF/RCP	Jun 97	295	295	0	295	0	0	0	295
APC Austin TX Lockheed Martin, Syracuse NY	MIPR	Nov 96			0	100	0	0	CONT	CONT
ESC, Hanscom	C/CPFF	Oct 96			0	300	2,705	711	CONT	CONT
ESC, Hanscom	MIPR	Oct 96	158	158	0	158	0	0	0	158
Project C2273					Page 169 - 33 of 169 - 75 Pages				Exhibit R-3	

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 1998			
BUDGET ACTIVITY <b>7 - Operational System Development</b>				PE NUMBER AND TITLE <b>0206313M Marine Corps Communications Systems</b>				PROJECT <b>C2273</b>		
AFB, MA										
3 <sup>rd</sup> MAW	WR	Oct98			0	0	0	10	CONT	CONT
MARCORSYSCOM	WR	Oct 98			0	0	0	90	CONT	CONT
CTQMCSC	C/CPFF	Nov 98			0	0	0	2500	CONT	CONT
Quantico, VA										
TBD	RCP	Nov			0	0	0	455	CONT	CONT
<b>Support and Management Organizations</b>										
NSWC Crane IN	WR	Oct 96			0	292	185	100	CONT	CONT
CRC Dumfries VA	CPFF	Oct 97	411	411	0	0	411	0	0	411
MCTSSA	WR	Oct 96			0	504	193	100	CONT	CONT
CSC Dumfries VA	CPFF	Oct 96			0	1126	300	100	CONT	CONT
MCSC	WR	Sep 97			0	70	50	25	CONT	CONT
Quantico, VA										
MCSC	CPFF/RCP	Sep 97	280	280	0	280	0	0	0	280
Quantico, VA										
MARCORSYSCOM	WR	Oct 98	50	50	0	0	0	50	0	50
Quantico, VA										
MARCORSYSCOM	WR	Oct 98			0	0	0	100	CONT	CONT
<b>Test and Evaluation Organizations</b>										
TBD	WR	Oct 98			0	0	0	1000	CONT	CONT
					Total					
					Prior to					
					<u>FY 1997</u>		<u>FY 1997</u>		<u>FY 1998</u>	
					<u>FY 1997</u>		<u>FY 1997</u>		<u>FY 1999</u>	
							Budget to		Total	
							Complete		Program	
Subtotal Product Development							5202		3863	
Subtotal Support and Management							4891		CONT	
Subtotal Test and Evaluation							2272		1139	
SBIR Tax							0		0	
Total Project							0		1000	
							0		133	
							7474		5135	
							6366		CONT	
<b>C. (U) Funding Profile: Not Applicable.</b>										

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<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)</b>							DATE <b>February 1998</b>		
BUDGET ACTIVITY <b>7 - Operational System Development</b>				PE NUMBER AND TITLE <b>0206313M Marine Corps Communications Systems</b>				PROJECT <b>C2274</b>	
COST <i>(In Thousands)</i>	FY 1997 Actual	FY 1998 Estimate	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	Cost to Complete	Total Cost
C2274 C2 Warfare Systems	3937	3275	4007	3865	3321	3853	4575	Continuing	Continuing
Quantity of RDT&E Articles									
<p><b>A. (U) <u>Mission Description and Budget Item Justification:</u></b> Command and Control (C2) Warfare Project includes the following tactical electronic intercept, direction finding, and electronic attack systems: The Tactical Electronic Reconnaissance Processing and Evaluation System (TERPES) is used to process, sort, analyze, display and correlate ES and EA data collected by EA-6B aircraft and maintain the Tactical Electronic Orders of Battle. The Mobile Electronic Warfare Support System (MEWSS) will be used to collect and process electronic intelligence and provide electronic attack capability from a mobile ground platform. Team Portable collection System (TPCS) upgrade is a semi-automated, manpackable/team transportable signals intelligence system that provides communications intercept, radio direction finding analysis and reporting to the Marine Air Ground Task Force (MAGTF) Commander.</p> <p><b>PROGRAM ACCOMPLISHMENTS AND PLANS</b></p> <p><b>(U) FY 1997 Accomplishments:</b></p> <ul style="list-style-type: none"> <li>• (U) \$ 1000 TERPES: Continued upgrades to TERPES mission planning software to maintain compatibility with EA-6B aircraft software changes.</li> <li>• (U) \$ 763 TERPES: Initiated development of Tactical Automated Sanitation capability or similar Multi-Level Security (MLS) device or procedure.</li> <li>• (U) \$ 1184 TERPES: Completed Developmental Testing and Interoperability Testing of TERPES Downsize effort (TPU).</li> <li>• (U) \$ 55 TERPES: Completed IOT&amp;E of TERPES Downsize effort (TPU).</li> <li>• (U) \$ 935 MEWSS: Completed USMC-unique integration activity for common sensor suite.</li> </ul> <p>(U)Total \$ 3,937</p> <p><b>(U) FY 1998 Planned Program:</b></p> <ul style="list-style-type: none"> <li>• (U) \$ 258 MEWSS: Initiate USMC unique cost share of Army's continued subsystem development to target evolving threat communications and non-communications emitters, and electronic attack.</li> <li>• (U) \$ 260 MEWSS: Support participation in Initial Operational Test &amp; Evaluation. Achieved MSIII.</li> <li>• (U) \$ 313 TPCS Upgrade: Funds remaining TPCS upgrade software development to control and exploit special signal receivers and analysis tools.</li> <li>• (U) \$ 123 TPCS Upgrade: Fund Streamlined Operational Test (SOT) of TPCS Phase I Upgrade for special signal/DF receiver.</li> <li>• (U) \$ 187 TPCS Upgrade: Systems Engineering and Technical Assistance (SETA).</li> </ul>									
Project C2274			Page 169 - 35 of 169 - 75 Pages				Exhibit R-2		

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<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)</b>		DATE <b>February 1998</b>	
<b>BUDGET ACTIVITY</b> <b>7 - Operational System Development</b>	<b>PE NUMBER AND TITLE</b> <b>0206313M Marine Corps Communications Systems</b>	<b>PROJECT</b> <b>C2274</b>	
<ul style="list-style-type: none"> <li>• (U) \$ 987 TERPES: Continue upgrades to TERPES mission planning software to maintain compatibility with the EA-6B aircraft software changes. Achieved MSIII for Phase III configuration.</li> <li>• (U) \$ 605 TERPES: Continue development of Tactical Automation Sanitation capability or similar Multi-Level Security (MLS) device or procedure.</li> <li>• (U) \$ 501 TERPES: Begin software development of Link 16 Tadir J to be incorporated into fusion processor.</li> <li>• (U) \$ 41 SBIR: Portion of program reserved for Small Business Innovation Research assessment in accordance with 15 U.S.C. 638 (f) (1).</li> </ul> <p>(U)Total \$ 3,275</p> <p><b>(U) FY 1999 Planned Program:</b></p> <ul style="list-style-type: none"> <li>• (U) \$ 288 MEWSS: Continue USMC unique cost share of Army's continued subsystem development to target evolving threat communications and non-communications emitters, and electronic attack.</li> <li>• (U) \$ 161 MEWSS: Development efforts in support of Electronic Attack capabilities.</li> <li>• (U) \$ 310 TPCS Upgrade: Transition to TOPHUNTER 2.0 software to Defense Information Infrastructure (DII) common operating environment (COE).</li> <li>• (U) \$ 217 TPCS Upgrade: Fund Phase II IOT&amp;E of TPCS Upgrade.</li> <li>• (U) \$ 295 TPCS Upgrade: Software revisions to TOPHUNTER 2.0 software.</li> <li>• (U) \$ 301 TPCS Upgrade: Hardware revisions to TPCS Upgrade. Achieve MSIII Phase II.</li> <li>• (U) \$ 187 TPCS Upgrade: Systems Engineering and Technical Assistance (SETA).</li> <li>• (U) \$ 976 TERPES: Continue development of TERPES mission planning software to maintain compatibility with the EA-6B aircraft software changes.</li> <li>• (U) \$ 581 TERPES: Complete development of Tactical Automation Sanitation capability or similar Multi-Level Security (MLS) device or procedure.</li> <li>• (U) \$ 450 TERPES: Continue software development of Link 16 Tadir J to be incorporated into fusion processor.</li> <li>• (U) \$ 241 TERPES: Begin development of advanced communication suite upgrade for Joint interoperability communications suite software changes.</li> </ul> <p>(U)Total \$ 4,007</p>			
<b>B. (U) Project Change Summary</b>			
	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) Previous President's Budget	3369	3390	4012
(U) Adjustments to Previous President's Budget	+568	-115	-5
(U) Current Budget Submit	3937	3275	4007
Project C2274		Page 169 - 36 of 169 - 75 Pages	Exhibit R-2

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<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)</b>							DATE <b>February 1998</b>																																																																								
<b>BUDGET ACTIVITY</b> <b>7 - Operational System Development</b>				<b>PE NUMBER AND TITLE</b> <b>0206313M Marine Corps Communications Systems</b>				<b>PROJECT</b> <b>C2274</b>																																																																							
<p>(U) Change Summary Explanation:          (U) Funding:              FY 1997 adjustments are due to minor affordability adjustments.              FY 1998 and FY 1999 adjustments are due to minor affordability adjustments.</p> <p>(U) Schedule: MEWSS: MS III deferred to 4Q98 to coincide with multi-service (U.S. Army) Intelligence and Electronic Warfare Common Sensor, Ground-Based Common Sensor-Light (IEWCS, GBCS-L) MS III decision. Combining test events with GBCS-L program is most economical means of conducting IOT&amp;E for this complex system.              TPCS: Production decreases changed due to TPCS testing delayed from June to Sept, non-availability of training area until Sept 98.</p> <p>(U) Technical: N/A</p>																																																																															
<table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;"><b>C. (U) <u>Other Program Funding Summary</u></b> <b>(APPN, BLI #, NOMEN)</b></th> <th style="text-align: center;"><u>FY 1997</u></th> <th style="text-align: center;"><u>FY 1998</u></th> <th style="text-align: center;"><u>FY 1999</u></th> <th style="text-align: center;"><u>FY 2000</u></th> <th style="text-align: center;"><u>FY 2001</u></th> <th style="text-align: center;"><u>FY 2002</u></th> <th style="text-align: center;"><u>FY 2003</u></th> <th style="text-align: center;"><u>To</u> <u>Compl</u></th> <th style="text-align: center;"><u>Total</u> <u>Cost</u></th> </tr> </thead> <tbody> <tr> <td>(U) PMC BLI 474900 Modification Kits INTEL     TERPES</td> <td style="text-align: right;">1125</td> <td style="text-align: right;">4308</td> <td style="text-align: right;">0</td> <td style="text-align: right;">3875</td> <td style="text-align: right;">0</td> <td style="text-align: right;">2921</td> <td style="text-align: right;">0</td> <td style="text-align: right;">0</td> <td style="text-align: right;">12229</td> </tr> <tr> <td>(U) PMC BLI 463600 Modification Kits     MAGTF C4I     MEWSS</td> <td style="text-align: right;">11120</td> <td style="text-align: right;">14300</td> <td style="text-align: right;">14836</td> <td style="text-align: right;">22105</td> <td style="text-align: right;">22760</td> <td style="text-align: right;">4471</td> <td style="text-align: right;">0</td> <td style="text-align: right;">0</td> <td style="text-align: right;">89592</td> </tr> <tr> <td>(U) PMC BLI 474900 Modification Kits INTEL     TPCS</td> <td style="text-align: right;">0</td> <td style="text-align: right;">0</td> <td style="text-align: right;">3128</td> <td style="text-align: right;">2841</td> <td style="text-align: right;">2046</td> <td style="text-align: right;">0</td> <td style="text-align: right;">0</td> <td style="text-align: right;">0</td> <td style="text-align: right;">8015</td> </tr> <tr> <td>(U) O&amp;M     TERPES</td> <td style="text-align: right;">819</td> <td style="text-align: right;">2146</td> <td style="text-align: right;">2325</td> <td style="text-align: right;">2397</td> <td style="text-align: right;">2472</td> <td style="text-align: right;">2540</td> <td style="text-align: right;">2629</td> <td style="text-align: right;">Cont</td> <td style="text-align: right;">Cont</td> </tr> <tr> <td>    MEWSS</td> <td style="text-align: right;">611</td> <td style="text-align: right;">0</td> <td style="text-align: right;">0</td> <td style="text-align: right;">0</td> <td style="text-align: right;">0</td> <td style="text-align: right;">0</td> <td style="text-align: right;">0</td> <td style="text-align: right;">0</td> <td style="text-align: right;">611</td> </tr> <tr> <td>    TPCS</td> <td style="text-align: right;">2423</td> <td style="text-align: right;">558</td> <td style="text-align: right;">894</td> <td style="text-align: right;">1138</td> <td style="text-align: right;">931</td> <td style="text-align: right;">923</td> <td style="text-align: right;">950</td> <td style="text-align: right;">0</td> <td style="text-align: right;">7817</td> </tr> </tbody> </table>										<b>C. (U) <u>Other Program Funding Summary</u></b> <b>(APPN, BLI #, NOMEN)</b>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>To</u> <u>Compl</u>	<u>Total</u> <u>Cost</u>	(U) PMC BLI 474900 Modification Kits INTEL TERPES	1125	4308	0	3875	0	2921	0	0	12229	(U) PMC BLI 463600 Modification Kits MAGTF C4I MEWSS	11120	14300	14836	22105	22760	4471	0	0	89592	(U) PMC BLI 474900 Modification Kits INTEL TPCS	0	0	3128	2841	2046	0	0	0	8015	(U) O&M TERPES	819	2146	2325	2397	2472	2540	2629	Cont	Cont	MEWSS	611	0	0	0	0	0	0	0	611	TPCS	2423	558	894	1138	931	923	950	0	7817
<b>C. (U) <u>Other Program Funding Summary</u></b> <b>(APPN, BLI #, NOMEN)</b>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>To</u> <u>Compl</u>	<u>Total</u> <u>Cost</u>																																																																						
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MEWSS	611	0	0	0	0	0	0	0	611																																																																						
TPCS	2423	558	894	1138	931	923	950	0	7817																																																																						
<p><b>(U) Related RDT&amp;E</b></p> <p>(U) PE 0604270A (Intelligence and Electronic Warfare Common Sensor (IEWCS), TACJAM-A).</p> <p>(U) MEWSS is fully integrated in the IEWCS program as a fourth platform.</p> <p>(U) PE 0305885G (Tactical Cryptologic Program)</p>																																																																															
Project C2274			Page 169 - 37 of 169 - 75 Pages				Exhibit R-2																																																																								

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)

DATE February 1998

BUDGET ACTIVITY  
7 - Operational System Development

PE NUMBER AND TITLE  
0206313M Marine Corps Communications  
Systems

PROJECT  
C2274

D. (U) Schedule Profile

**TERPES  
UPGRADE**

EVENT	FY 95	FY 96	FY 97	FY 98	FY 99
ORD Signed	▲ Apr				
Doc Update	▲▲ May-Jun				
MS I I L A R	▲ May				
MS I-II	▲ Mar				
CV Delivery	▲ Apr				
VMAQ-CV Det	▲	▲ Aug - Feb			
DT&E			▲	▲ Nov-May	
Interop Test			▲ May		
OT&E			▲ May		
OT Report				△ Sep	
MS III L A R				△△ Sep-Oct	
MS III				△ Dec	
IOC				△ Sep	
FOC					△ Mar

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<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)</b>	DATE <b>February 1998</b>
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BUDGET ACTIVITY <b>7 - Operational System Development</b>	PE NUMBER AND TITLE <b>0206313M Marine Corps Communications Systems</b>	PROJECT <b>C2274</b>
--	--	-------------------------

MILESTONE SCHEDULE  
 PROJECT TITLE: MEWSS-PIP  
 PE NO.: 206313M  
 PROJECT NO.: C2274

	FY 96	FY97	FY98	FY99	FY00	FY01	FY02	FY03
PROGRAM MILESTONES		MS IIA LRIP 1ST QTR	MS III 4TH QTR	IOC 3RD QTR			FOC	
ENGINEERING MILESTONES		EDM Complete 4TH QTR						
T&E MILESTONES	OP ASSESS 4TH QTR		IOT&E 3RD QTR	FOT&E 4TH QTR				
CONTRACT MILESTONES	IEWCS Production	MEWSS Production						

<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)</b>	DATE <b>February 1998</b>
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<b>BUDGET ACTIVITY</b> <b>7 - Operational System Development</b>	<b>PE NUMBER AND TITLE</b> <b>0206313M Marine Corps Communications Systems</b>	<b>PROJECT</b> <b>C2274</b>
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**MILESTONE SCHEDULE**  
**PROJECT TITLE: TPCS Upgrade**  
**PE NO: 0206313M**  
**PROJECT NO: C2274**

	FY 96	FY 97	FY 98	FY 99	FY 00	FY 01	FY 02
<b>PROGRAM MILESTONES</b>		2Q MSII		4Q MS III (Phase II) 2Q Production Decsion (Phase I)	1Q Phase I IOC 3Q Phase I FOC	1Q IOC	2Q FOC 4Q Upgrade #2 MS II
<b>ENGINEERING MILESTONES</b>			1Q CDR				
<b>T&amp;E MILESTONES</b>			2Q OA 2Q DT (Phase I)	2Q OT&E (Phase II)	3Q FOT&E (Phase II)		
<b>CONTRACT MILESTONES</b>		4Q TOP RIGGER EMD		2Q Production			



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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 1998			
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0206313M Marine Corps Communications Systems				PROJECT C2274		
<b>A. (U) Project Cost Breakdown</b>				<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>				
a. System Design/Integration/Development				1832	1272	1354				
b. Development Testing/Operational Testing				1239	397	434				
c. Management Support Services				342	1037	1038				
d. Software Development					239	605				
e. Primary Hardware Development				524	330	576				
f. SBIR				0	41	0				
Total				3937	3275	4007				
<b>B. Budget Acquisition History and Planning Information</b>										
<b>Performing Organizations</b>										
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 1997	FY 1997	FY 1998	FY 1999	Budget to Complete	Total Program
<b>Product Development Organizations</b>										
MEWSS										
Raytheon E-System	CPAF	Jan 97	935	935		935	0	0	0	935
Lockheed Martin Fed Sys, Owego	CPFF	Jun 98				0	532	449	CONT	CONT
TPCS Upgrade										
BTG	CPFF	Oct 97				0	313	906	CONT	CONT
TERPES										
NAWCWPNS, Pt Mugu, CA	WR	Oct 96				897	926	1066	CONT	CONT
	RCP	Oct 96				523	330	331	CONT	CONT
<b>Support and Management Organizations</b>										
TPCS Upgrade										
TBD	CPFF	Oct 96				310	1037	1038	CONT	CONT
Project C2274				Page 169 - 41 of 169 - 75 Pages				Exhibit R-3		

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE
BUDGET ACTIVITY										February 1998
<b>7 - Operational System Development</b>					PE NUMBER AND TITLE					PROJECT
					<b>0206313M Marine Corps Communications Systems</b>					<b>C2274</b>
TERPES										
NAWCWPNS, Pt Mugu, CA	WR	Oct 96	32	32	0	32	0	0	0	32
SBIR	VARIOUS	VARIOUS	41	41	0	0	41	0	0	41
<b>Test and Evaluation Organizations</b>										
TPCS Upgrade										
TEXCOM	MIPR	Jan 98				0	137	217	CONT	CONT
TERPES										
NAWCWPNS Pt Mugu, CA	RCP	Oct 96	1240	1240	0	1240	0	0	0	1240
					Total					
					Prior to					
					<u>FY 1997</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>Budget to</u>	<u>Total</u>
Subtotal Product Development						2355	2101	2752	CONT	CONT
Subtotal Support and Management						342	1037	1038	CONT	CONT
Subtotal Test and Evaluation						1240	137	217	CONT	CONT
Total Project						3937	3275	4007	CONT	CONT
C. (U) <u>Funding Profile</u> : Not Applicable.										

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<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)</b>	DATE <b>February 1998</b>
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BUDGET ACTIVITY <b>7 - Operational System Development</b>	PE NUMBER AND TITLE <b>0206313M Marine Corps Communications Systems</b>	PROJECT <b>C2275</b>
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COST (In Thousands)	FY 1997 Actual	FY 1998 Estimate	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	Cost to Complete	Total Cost
C2275 Radio Systems	365	4949	2950	5094	2343	725	723	Continuing	Continuing
Quantity of RDT&E Articles									

**A. (U) Mission Description and Budget Item Justification:** This project provides for development and improvement of Single Channel radios to support the Marine Corps Communications Systems Command, Control, Communications, Computers and Intelligence (C4I) infrastructure. The Single-Channel Ground-Air Radio System (SINCGARS) is a single-channel, very-high-frequency (VHF), frequency-hopping joint-service product; RDT&E,N funds are used to accommodate improvements in the basic design as a result of field use. The Ground Mobile Forces (GMF) tri-band satellite terminal provides the Marine Air Ground Task Force (MAGTF) with a super-high-frequency (SHF), tri-band (C,Ku, & X-band) satellite capability. The General Purpose Radio Remote (GPRR) will allow all Marine Corps inventory tactical radios to be physically located away from MAGTF Command Posts (CP). This action significantly reduces the electronic signature of the CP, thus, increasing the CP's survivability. The GPRR will be a digital system that will throughput voice and data channels. RDT&E funds will be used to assess current technology, evaluate potential solutions, test selected solutions, and provide engineering and program support. The Joint Tactical Communication System (JTCS) will provide a communications system with a waveform that cannot be detected by current electronic support measure systems; the technology for this system is being developed within the USMC Advanced Technology Demonstration (ATD) program; upon successful completion of the current ATD, a joint program with the Army Program Manager Tactical Radio Communications Systems to develop JTCS technology for field use will be initiated. The AN/PSC-5 Installation Kits will fill a valid requirement for the HMMWV mounted radios. The kits provide a survivable platform and power source for a vehicle mounted AN/PSC-5 manpack satellite radio. The Enhanced Position Location Reporting System (EPLRS) will provide Marine Forces with a critical command, control, and situational awareness data distribution network that does not currently exist. EPLRS is the communications link for numerous MAGTF C4I tactical data systems. RDT&E funds will be used to fund systems interface, user evaluations, testing, and acquisition programmatic documentation. The Tactical Hand Held Radio (THHR) is a radio system characterized by its small size, lightweight, durability, reliability, and simplicity. The radio will operate in the VHF band, and the UHF bands while employing embedded NSA approved Type 1 COMSEC. The THHR will be capable of VHF/UHF line of sight communications of three miles. The THHR will interface with a variety of digital devices and interoperate with existing Marine Corps VHF/UHF tactical radios. The radio will be powered by use of either rechargeable or disposable batteries. The program will use a military-ready Commercial Off-the Shelf (COTS) system to provide Marine Corps units with a standardized, maintainable, hand held radio to support the communications requirements of small units (platoon, squad and team).

**PROGRAM ACCOMPLISHMENTS AND PLANS**

**(U) FY 1997 Accomplishments:**

- (U) \$ 25 GMF: Developed and updated Life Cycle Cost Estimate (LCCE)

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<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)</b>		DATE <b>February 1998</b>
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
<b>7 - Operational System Development</b>	<b>0206313M Marine Corps Communications Systems</b>	<b>C2275</b>
• (U) \$ 100	AN/PSC-5: Developed and tested installation kit and mount. Managed and supported TI development.	
• (U) \$ 240	SINCGARS: Developed and incorporated a SINCGARS Cosite Receiver Analysis Module (SCRAM) for antennas into the Marine Corps Systems Planning Engineering and Evaluation Device. Provided general technical support to the Marine Corps SINCGARS Program Office.	
(U)Total \$ 365		
<b>(U) FY 1998 Planned Program:</b>		
• (U) \$ 324	GMF: Support integrated logistic support, documentation development and program management.	
• (U) \$ 259	GPRR: Fund Analysis of Alternatives (AOA) to determine which currently available technologies will best satisfy the GPRR core requirements. Investigate GPRR sub-component technologies through studies and simulation to determine, characterize, and reduce program technology risk.	
• (U) \$ 265	GPRR: Major component technology risk reduction: Investigate performance and vulnerabilities of ultra-wideband, short-pulse electromagnetics technology to determine applicability to RF wireless segment.	
• (U) \$ 210	GPRR: Develop and document acquisition strategy, program documentation, refine ORD, and initiate logistics analysis.	
• (U) \$ 919	EPLRS: Fund integration and documentation of EPLRS with a subset of existing tactical data systems for user evaluation required for a Milestone III production decision.	
• (U) \$ 350	EPLRS: Fund user evaluation for production decision.	
• (U) \$ 500	EPLRS: Fund engineering and development of two EPLRS Net Control Stations from two Down Sized Master Station EDM's.	
• (U) \$ 400	THHR: Radio for P/OT.	
• (U) \$ 700	THHR: DT&E/OT&E.	
• (U) \$ 900	THHR: Program Development, ILS training manual, maintenance analyss.	
• (U) \$ 122	SBIR: Portion of program reserved for Small Business Innovation Research assessment in accordance with 15 U.S.C. 638 (f) (1).	
(U)Total \$ 4,949		
<b>(U) FY 1999 Planned Program:</b>		
• (U) \$ 1452	GPRR: Investigate and downselect technologies GPRR sub-component technologies, and refine human engineering requirements. Initiate system threat assessment for identified technologies. Achieve MSI/II.	
• (U) \$ 250	GPPR: Initiate and document GPRR interoperability requirements with current C4I systems for DT/OT.	
• (U) \$ 350	GPPR: Continue preparation and refinement of program and logistics documentation.	
• (U) \$ 498	JTCS: Commerce demonstration and validation JTCS under tactical applications identified in the emerging Operational Requirements Document. Assemble system prototypes; establish DT/OT-01 test parameters.	
• (U) \$ 400	EPLRS: Fund engineering; and development of EPLRS User Unit (EPUU) interface with tactical data equipment and Marine Corps unique tactical vehicles.	
(U)Total \$ 2,950		
Project C2275	Page 169 - 44 of 169 - 75 Pages	Exhibit R-2

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<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)</b>							DATE <b>February 1998</b>				
<b>BUDGET ACTIVITY</b> <b>7 - Operational System Development</b>				<b>PE NUMBER AND TITLE</b> <b>0206313M Marine Corps Communications Systems</b>				<b>PROJECT</b> <b>C2275</b>			
<b>B. (U) <u>Project Change Summary</u></b>				<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>					
(U) Previous President's Budget				402	2507	2592					
(U) Adjustments to Previous President's Budget				-37	+2442	+358					
(U) Current Budget Submit				365	4949	2950					
 (U) Change Summary Explanation:											
(U) Funding:    FY97 and FY 99 changes are due to minor affordability adjustments. FY98 change is due to minor affordability and additional funds for Tactical Hand Held Radio (THHR)											
(U) Schedule: N/A											
(U) Technical: N/A											
<b>C. (U) <u>Other Program Funding Summary</u></b>			<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>To</u>	<u>Total</u>
<b>(APPN, BLI #, NOMEN)</b>											
(U) PMC BLI 463300 RADIO SYS, GMF			0	0	8293	26676	26161	0	0	<u>Compl</u>	<u>Cost</u>
(U) PMC BLI 463300 RADIO SYS , SINCGARS			40007	8484	8774	5078	0	0	0	0	61130
(U) PMC BLI 463300 RADIO SYS, GPRR			0	0	0	0	0	13110	14263	Cont	Cont
(U) PMC BLI 463300 RADIO SYS, AN/PSC-5			148	18	4179	0	0	0	0	0	4345
(U) PMC BLI 463300 RADIO SYS, EPLRS					17774	10605	2927	2436	0	0	33742
(U) O&M, SINCGARS			445	115	73	75	77	79	81	Cont	Cont
(U) O&M, EPLRS			0	0	0	500	900	600	800	Cont	Cont
<b>(U) Related RDT&amp;E</b>											
(U) PE 0303140N (Information Systems Security Plan) Project X0734, Communications Security Research and Development											
(U) PE 0604805A (Command, Control, and Communications Systems Engineering Development) SINCGARS (V)											

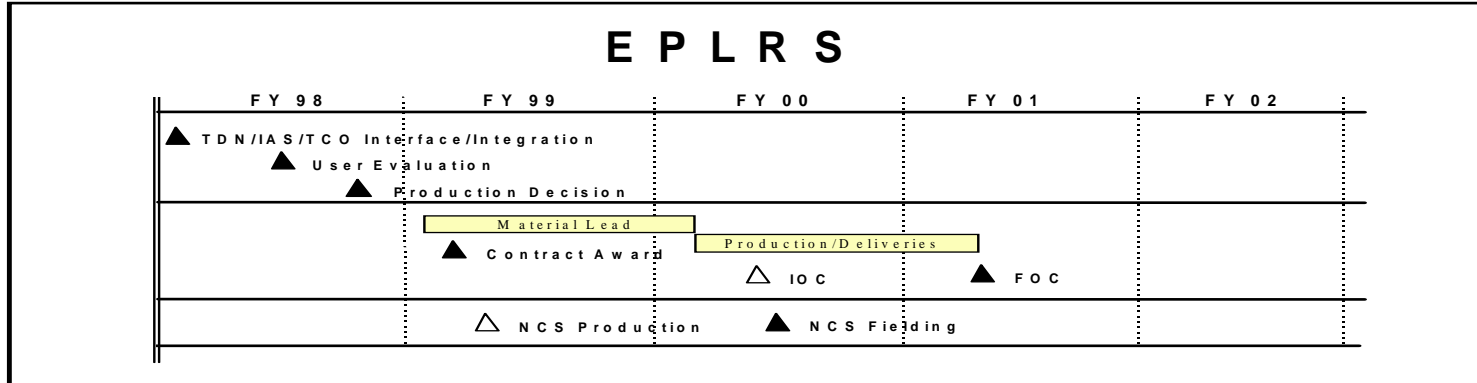
<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)</b>		DATE <b>February 1998</b>
BUDGET ACTIVITY <b>7 - Operational System Development</b>	PE NUMBER AND TITLE <b>0206313M Marine Corps Communications Systems</b>	PROJECT <b>C2275</b>

**D. (U) Schedule Profile:**

## GPPR SCHEDULE PROFILE

	FY 98				FY 99				FY 00				FY 01			
	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr
Milestones	◆ MS 0						◆ MS I/II								◆ MS III	
Program Support	[Shaded Bar]															
Deliveries						◆ EOA			◆ LRIP							
DT/OT											◆ DT&E			◆ OT		

<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)</b>		DATE <b>February 1998</b>
BUDGET ACTIVITY <b>7 - Operational System Development</b>	PE NUMBER AND TITLE <b>0206313M Marine Corps Communications Systems</b>	PROJECT <b>C2275</b>



<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)</b>		DATE <b>February 1998</b>
BUDGET ACTIVITY <b>7 - Operational System Development</b>	PE NUMBER AND TITLE <b>0206313M Marine Corps Communications Systems</b>	PROJECT <b>C2275</b>

GMF

Task Name	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
MC MS-0				▲ MC MS-0									
PROGRAM MS-I/IIIA						▲ ARMY MSI/III							
CONTRACTAWARD						△		△					
DELIVERIES							▣	OPTION (MC)					
DT&E							▣	GOVERNMENT TESTING					
OT								▣	JOINT				
MC MILESTONE III (FIELDING DECISION)								▲					



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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE		
BUDGET ACTIVITY							February 1998		
7 - Operational System Development				PE NUMBER AND TITLE			PROJECT		
				0206313M Marine Corps Communications Systems			C2275		
<b>A. (U) Project Cost Breakdown</b>				<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>			
<b>Contractor Engineering Support</b>									
SINGGARS				20	0	0			
GPRR				0	524	1452			
EPLRS				0	235	75			
<b>Developmental Test and Evaluation</b>									
EPLRS				0	350	75			
THHR					1100				
<b>Program Management Support</b>									
GMF				25	324	0			
GPRR				0	210	350			
AN/PSC-5				100	0	0			
EPLRS				0	315	50			
THHR					900				
SBIR				0	122				
<b>System Engineering</b>									
SINGGARS				220	0	0			
GPRR				0	0	250			
JTCS				0	0	498			
EPLRS				0	869	200			
<b>Total</b>				<b>365</b>	<b>4949</b>	<b>2950</b>			
<b>B. Budget Acquisition History and Planning Information</b>									
<b>Performing Organizations</b>									
Contractor or	Contract								
Government	Method/Type	Award or	Performing	Project	Total				
Performing	or Funding	Obligation	Activity	Office	Prior to			Budget to	
Activity	Vehicle	Date	EAC	EAC	FY 1997	FY 1997	FY 1998	FY 1999	
								Complete	
								Total	
								Program	
<b>Product Development Organizations</b>									
SINGGARS									

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE	
										February 1998	
BUDGET ACTIVITY					PE NUMBER AND TITLE					PROJECT	
<b>7 - Operational System Development</b>					<b>0206313M Marine Corps Communications Systems</b>					<b>C2275</b>	
Joint Spectrum Center Annapolis	CPFF/Reqn	Oct 96	220	220		220	0	0	0	220	
GPRR: IDIQ	CPFF/Reqn	Oct 97	8848	8848		0	734	2052	5578	8364	
JTCS: TBD	TBD	Oct 98				0	0	498	3317	3815	
EPLRS: IDIQ	CPFF/Reqn	Oct 97	1769	1769		0	1769	400	0	2169	
THHR							2000	0	0	2000	
SBIR	Various	Various	122	122	0	122	0	0	0	122	
<b>Support and Management Organizations</b>											
SINCGARS: JSC	CPFF/Reqn	Oct 96	20	20		20	0	0	0	20	
ANNAPOLIS MD											
GMF: VRI	CFFP/Reqn	Aug 96	25	25		25	0	0	0	25	
DUMFRIES VA											
GMF: TBD	CFFP/Reqn	Oct 97	348	348		0	324	0	0	324	
PSC5: NSWC	WR	Mar 97	100	100		100	0	0	0	100	
DAHLGREN VA											
<b>Test and Evaluation Organizations</b>											
Not Applicable											
					Total						
					Prior to						
					<u>FY 1997</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>Budget to</u>	<u>Total</u>	
Subtotal Product Development						220	4625	2950	8895	16690	
Subtotal Support and Management						145	324	0	0	469	
Subtotal Test and Evaluation											
Total Project						365	4949	2950	CONT	CONT	
 <b>C. (U) <u>Funding Profile:</u> Not Applicable.</b>											

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<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)</b>							DATE <b>February 1998</b>			
BUDGET ACTIVITY <b>7 - Operational System Development</b>				PE NUMBER AND TITLE <b>0206313M Marine Corps Communications Systems</b>				PROJECT <b>C2276</b>		
<i>COST (In Thousands)</i>	FY 1997 Actual	FY 1998 Estimate	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	Cost to Complete	Total Cost	
C2276 Communications Switching and Control System	3288	1959	2106	1746	1836	0	0	0	10935	
Quantity of RDT&E Articles										
<p><b>A. (U) <u>Mission Description and Budget Item Justification:</u></b> This program consists of four interrelated projects: Unit Level Circuit Switch Product Improvement Program (ULCS PIP), Digital Technical Control (DTC), Tactical Data Network (TDN), and Defense Message System (DMS). Together, these systems form an integrated, digital communications backbone for a deployed Marine Air Ground Task Force (MAGTF) which has the capability to manage, control, switch, and multiplex networks providing voice, data, message, imagery, facsimile, and video services to subscribers.</p> <p>(U) The ULCS PIP will upgrade the ULCS circuit switches (AN/TTC-42 Central Office Telephone radio and switchboard SB-3865). The ULCS PIP is a competitive procurement of special purpose circuit card assemblies (CCAs) produced from a government-owned technical data package. The additional CCAs will provide improved access to fixed plant analog and trunk connections. Additional enhancements provide STU-III secure telephone interfaces in the AN/TTC-42 and SB-3865. The ULCS PIP requires low risk/medium technology engineering and development prior to build-to-print production.</p> <p>(U) The TDN augments existing MAGTF communications infrastructure to provide the commander an integrated data network forming the communication backbone for MAGTF tactical data systems and Defense Message System. The TDN consists of a network of Gateways and Servers interconnected with one another and their subscribers via a combination of common user long-haul transmission systems, local area networks, single channel radios, and the switched telephone system. The network provides its subscribers with basic data transfer and switching services; access to strategic, supporting establishment, joint, and other service component tactical data networks; network management capabilities; and value-added services such as message handling, directory services, file sharing, facsimile handling, and terminal emulation support. Required functionality was separated into three blocks of capabilities due to the leading edge technology required in the Operational Requirement Document (ORD). This evolutionary acquisition strategy and funding provide for development of additional capabilities which compose the Block II and Block III upgrades of the system.</p> <p>(U) The DTC facilitates the installation, operation, restoration, and management of individual circuits and digital links consisting of many multiplexed circuits. It provides the primary interface between subscriber systems/networks within a local area and long-haul multichannel transmissions systems to transport voice, message, data, and imagery traffic. It can add, drop and insert digital circuits into multiplexed groups; provide a source of stable timing to connected equipment; condition circuits; and perform analog/digital, 2-wire/4-wire, and signaling conversions. It contains the monitoring, testing, and patching equipment required by technical controllers to troubleshoot and restore faulty circuits and links. This funding provides for the development of interfaces to new technology transmission systems.</p> <p>(U) DMS is an OSD-mandated program to integrate Automatic Digital Network (AUTODIN) and E-Mail into a single, secure, DoD message communications system. DMS will expand writer-to-reader connectivity, support, and message security services. Organizations and individuals will be able to create, edit, send, receive, read, and</p>										
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BUDGET ACTIVITY  
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**0206313M Marine Corps Communications Systems**

process organizational and individual messages, secured with end-to-end protection, direct from desktop terminals/personal computers in their workspaces. DMS will do everything our current Banyan E-Mail and AUTODIN systems do with the following additional capabilities: connectivity to all users in DoD; Secure networking with all classifications (Unclass, Secret, TS, SCI) on a single network; ability to send organizational messages from the desktop.

**PROGRAM ACCOMPLISHMENTS AND PLANS**

**(U) FY 1997 Accomplishments:**

- (U)\$ 1333 DTC: Conducted Operational Test; Prepared for Milestone III/Approval for Service Use.
- (U)\$ 152 ULCS PIP: Completed ULCS software development for ULCS PIP.
- (U)\$ 1803 TDN: Continued Systems engineering, Hardware and Software Development and Integration of Block I. Continued TDN software testing/integration and document review. Conducted TDN Block I interoperability certification testing, operational test. Prepare for Milestone III block I approval for service use.

(U)Total \$ 3288

**(U) FY 1998 Planned Program:**

- (U)\$ 407 DTC: Development and Engineering system technology upgrades. Achieve MS III decision.
- (U)\$ 342 DMS: Support software and hardware integration/testing. Incorporate evolutionary security products into the unclassified DMS architecture within a Marine Corps-unique network infrastructure.
- (U)\$ 1196 TDN: Develop TDN Block II and Software/hardware integration/testing. Achieve MS III decision block I.
- (U)\$ 14 SBIR: Portion of program reserved for Small Business Innovation Research assessment in accordance with 15 U.S.C. 638 (f) (1).

(U)Total \$ 1,959

**(U) FY 1999 Planned Program:**

- (U)\$ 445 DTC: Engineering/testing system technology upgrades. Obtain MS III for ATM upgrade.
- (U)\$ 364 DMS: Support software and hardware integration/testing. Incorporate evolutionary security products into the unclassified DMS architecture within a Marine Corps-unique network infrastructure.
- (U)\$ 1297 TDN: Develop TDN Block II and software/hardware integration/testing. Achieve MS III decision for Block II.

(U)Total \$ 2,106

**B. (U) Project Change Summary**

FY 1997

FY 1998

FY 1999

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<b>BUDGET ACTIVITY</b> <b>7 - Operational System Development</b>				<b>PE NUMBER AND TITLE</b> <b>0206313M Marine Corps Communications Systems</b>				<b>PROJECT</b> <b>C2276</b>				
<b>B. (U) <u>Project Change Summary</u></b>				<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>						
(U) Previous President's Budget				2720	2084	2135						
(U) Adjustments to Previous President's Budget				+568	-125	-29						
(U) Current Budget Submit				3288	1959	2106						
(U) Change Summary Explanation:												
(U) Funding: FY 1997, FY 1998 and FY 1999 changes are due to minor affordability adjustments.												
(U) Schedule: N/A												
(U) Technical: N/A												
<b>C. (U) <u>Other Program Funding Summary</u></b>				<u>FY1997</u>	<u>FY1998</u>	<u>FY1999</u>	<u>FY2000</u>	<u>FY2001</u>	<u>FY2002</u>	<u>FY2003</u>	<u>To</u>	<u>Total</u>
(U) PMC BLI 463400 Communications Switching and Control Systems												
DTC				0	11328	18506	34396	27	0	0	0	64257
TDN				0	24964	49817	37682	11066	0	0	0	123529
ULCS				9798	0	2943	0	0	0	0	0	12741
DMS				4244	7271	4515	7502	3292	0	0	0	26824
(U) O&M												
DTC				0	0	224	208	213	219	0	0	864
TDN				0	47	91	122	122	0	0	0	382
DMS				165	211	399	386	406	299	242	0	2108
(U) Related RDT&E : N/A												
<b>D. (U) <u>Schedule Profile: DTC</u></b>												

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BUDGET ACTIVITY  
**7 - Operational System Development**

PE NUMBER AND TITLE  
**0206313M Marine Corps Communications Systems**

PROJECT  
**C2276**

ID	Task Name	1995				1996				1997				1998				1999				
		Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	
1	Milestone 0	◆																				
2	Milestone I/II			◆																		
3	Prototype Build at Tobyhanna																					
4	PALT																					
5	DTC/TDN Industry Day																					
6	Aberdeen Transportability Test																					
7	OT Site Survey/Train Conf #2																					
8	90% Manual Review																					
9	Final Draft TM due at MCSC																					
10	<b>OT Tech Controller Training</b>																					
18	TM due to MCOTEA																					
19	OT Readiness Review																					
20	Joint TPWG @ Ft Huachuca																					
21	<b>Operational Test</b>																					
25	MCOTEA Test Report Due																					
26	LAR																					
27	Milestone III																					
28	Production Contract Award																					
29	Develop & Test ATM Mod																					
30	Delivery - 31 Units																					
31	MS III for ATM Mod																					
32	IOC																					
33	FOC																					

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Tactical Data Network (TDN) Milestone Chart:

PHASE	FY 94	FY 95	FY 96	FY 97	FY 98	FY 99	FY 00	FY 01
MILESTONE 0	▲							
MILESTONE I/II		▲						
BLOCK I OT				■				
MILESTONE III					△			
PRODUCTION CONTRACT AWARD					△			
BLOCK I FIELDDED						△		
BLOCK II FIELDDED							△	
BLOCK III FIELDDED								△
IOC							△	
FOC								△

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<b>BUDGET ACTIVITY</b> <b>7 - Operational System Development</b>	<b>PE NUMBER AND TITLE</b> <b>0206313M Marine Corps Communications Systems</b>	<b>PROJECT</b> <b>C2277</b>
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<i>COST (In Thousands)</i>	FY 1997 Actual	FY 1998 Estimate	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	Cost to Complete	Total Cost
C2277 Systems Engineering and Integration	15002	189	6500	5716	2940	2931	2920	Continuing	Continuing
Quantity of RDT&E Articles	n/a	n/a	n/a	n/a	n/a	n/a	n/a		

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

This project provides funds for engineering, test, and evaluation activity which ensures that the systems being developed within the Program Element (PE) employ consistent standards for interoperability and, to the maximum extent feasible, use hardware and software which is uniform across programs. The Joint Marine Air-Ground Task Force Command, Control, Communications, Computers, and Intelligence Systems Engineering and Integration (JMAGTF C4I SE&I) subproject is a non-acquisition effort which provides centralized planning and execution of MAGTF C4I Systems; it is also used to develop and test common hardware and software for use in MAGTF C4I Systems; Joint Warrior Interoperability Demos (JWID) is a JCS-mandated program to demonstrate new C4I interoperability concepts for the warrior. JWID offers the opportunity for demonstrations of evolving technologies in interoperability, information dissemination, fusing and digital communications. JMAGTF C4I SE&I also funds USMC participation in joint planning and technical standards development. The Joint Interoperability of Tactical Command and Control Systems (JINTACCS) is a Joint Chiefs-of-Staff (JCS)-mandated program for joint development, implementation, and testing of data links under the direction of the Joint Interoperability Engineering Organization (JIEO). Global Command and Control Systems (GCCS) consists of Command and Control subsystems which enable the National Command Authorities (NCA), the Joint Staff, and the commanders at appropriate levels to direct and control the operation of U.S. Military forces. Combat Operations Center - Interim (COC(I)) development efforts focus on: Cognitive Task Analysis (CTA); enhanced ergonomic physical design; evaluation of advanced software development to support systems integration and advanced battlefield visualization concepts. The Rugged Handheld Computer (RHHC) effort will provide common hardware that is small, lightweight, rugged, and capable of meeting numerous missions in the field under harsh environmental conditions.



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BUDGET ACTIVITY <b>7 - Operational System Development</b>	PE NUMBER AND TITLE <b>0206313M Marine Corps Communications Systems</b>	PROJECT <b>C2277</b>
<b>PROGRAM ACCOMPLISHMENTS AND PLANS</b>		
<b>(U) FY 1997 Accomplishments:</b>		
• (U) \$	238	JWID: Continued systems engineering services in support of mandated Joint interoperability tests and demonstrations, such as Joint Warrior Interoperability Demonstrations, Roving Sands Exercises, and other-Service initiatives not contained in other USMC RDT&E programs.
• (U) \$	3,105	JINTACCS: Continued systems engineering to implement the emerging Joint Technical Architecture to include development of change proposals to Variable Message Format (VMF), Tactical Air Data Information Links (TADIL) A, B, C, and J, Army Tactical Data Link-1 (ATDL-1), NATO Link 1, Ship to Shore Ship Buffer (SSSB), and the United States Message Text Format (USMTF) as evolving joint standards. Provided joint testing/certification of Command/ Control/ Communications (C3) Systems through the Joint Tactical Air Operations (JTAO) program. Participated in systems engineering to provide integrated Theater Missile Defense (TMD). Provided interoperability testing/certification of C4I systems in the MAGTF C4I software and system engineering services to DOD working/steering groups.
• (U) \$	360	JINTACCS: Continued to maintain/update MAGTF C4I Interoperability Assurance Tool (MIAT).
• (U) \$	1,158	MAGTF SE&I: Continued re-engineering of legacy C2 systems to the Defense Information Infrastructure (DII) Common Operating Environment (COE) hardware and software environments to improve interoperability in Joint Operations. Ensured the MAGTF C4I Battlelab was populated with the latest versions of fielded TDSs and developing MAGTF C4I systems to provide a development environment which accurately modeled the system architecture of the Fleet Marine Forces.
• (U) \$	800	MAGTF SE&I: Continued to provide the Marine Corps' share of DII COE development and maintenance costs, systems engineering support including implementation of the MAGTF C4I configuration management (CM) process.
• (U) \$	794	MAGTF SE&I: Continued to provided systems engineering to centralize management, ensure proper testing, and provide integrated logistics support planning of hardware.
• (U) \$	1,400	MAGTF SE&I: Continued the development of a PC-client architecture for UNIX-based network server in MAGTF C4I tactical networks.
• (U) \$	2,400	GCCS: Accelerated improvements for GCCS system interoperability and functionality. Continued to roll functionality from legacy systems within a Marine Corps Combat Operations Center to the GCCS, initially as mission specific applications which are then proposed as enhancements to the Joint GCCS core.
• (U) \$	353	RHHC: Initiated the preparation for a Request for Quote (RFO), functional testing and evaluation of prototypes, and source selection.
• (U) \$	836	C4I: Provided engineering and technical support in support of the configuration management of the MAGTF C4I system. Provided analyses, studies, and reviews in the development of integrated logistics support documents.
• (U) \$	3,558	Forward financed efforts in this project and PE.
(U)Total \$	15,002	
<b>(U) FY 1998 Planned Program:</b>		

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BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
<b>7 - Operational System Development</b>	<b>0206313M Marine Corps Communications Systems</b>	<b>C2277</b>
<ul style="list-style-type: none"> <li>• (U) \$ 132 JWID: Participate in JWID, a JCS-mandated program, to demonstrate new C4I interoperability concepts. JWID-98 offers the opportunity for demonstrations of evolving technologies in interoperability, information dissemination, fusing and digital communications. Additionally, this effort forward financed with \$257 FY97 funds from this project and PE.</li> <li>• (U) \$ 0 JSTARS: Initiate the development of USMC hardware and software connectivity between the JSTARS system and the required JSTARS Connectivity sites and MAGTF C4I systems. This effort forward financed with \$229 FY97 funds from this project and PE.</li> <li>• (U) \$ 0 MAGTF SE&amp;I: Continue DII COE migration to include enhanced open system, capabilities, distributed directory service, distributed file service with data replication, enhanced security, and modern desktop manger to include user configured icon and toolbars. This effort forward financed with \$322 FY97 funds from this project and PE.</li> <li>• (U) \$ 0 MAGTF SE&amp;I: Continue to provide systems engineering efforts to centralize management, ensure proper testing, and provide integrated support planning of hardware. This effort forward financed with \$700 FY97 funds from this project and PE.</li> <li>• (U) \$ 0 MAGTF SE&amp;I: Continue to provide engineering and technical support in support of the configuration management of the MAGTF C4I system and its migration to the DII COE. Provide analyses, studies, and reviews in the development of an integrated migration strategy. Continue to provide systems engineering efforts to implement the emerging Joint Technical Architecture. Provide interoperability testing/certification of MAGTF C4I systems. This effort forward financed with \$2050 FY97 funds from this project and PE.</li> <li>• (U) \$ 57 SBIR: Portion of program reserved for Small Business Innovatio Research assessment in accordance with 15 U.S.C. 638 (f)(1).</li> </ul>	<ul style="list-style-type: none"> <li>Total \$ 189</li> </ul>	
<b>(U) FY 1999 Planned Program:</b>		
<ul style="list-style-type: none"> <li>• (U) \$ 794 JWID: Continue participation in JWID, a JCS-mandated program, to demonstrate new C4I interoperability concepts. JWID-99 offers the opportunity for demonstrations of evolving technologies in interoperability, information dissemination, fusing and digital communications.</li> <li>• (U) \$ 2,669 MAGTF SE&amp;I: Initiate Independent Verification and Validation (IV&amp;V) to certify that all MAGTF C4I systems are Year 2000 complaint.</li> <li>• (U) \$ 2,787 MAGTF SE&amp;I: Continue to provide engineering and technical support in the support of configuration management of the MAGTF C4I system and its migration to the DII COE. Provide analyses, studies, and reviews in the development of an integrated migration strategy. Continue to provide systems engineering efforts to implement the emerging Joint Architecture. Provide interoperability testing/certification of MAGTF C4I systems.</li> <li>• (U) \$ 250 JSTARS: Perform tests and exercise with the JSTARS CGS and JSTARS Connectivity prototype(s)</li> </ul>	<ul style="list-style-type: none"> <li>(U)Total \$ 6,500</li> </ul>	

<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)</b>							DATE <b>February 1998</b>				
BUDGET ACTIVITY <b>7 - Operational System Development</b>			PE NUMBER AND TITLE <b>0206313M Marine Corps Communications Systems</b>				PROJECT <b>C2277</b>				
<b>B. (U) <u>Project Change Summary</u></b>			<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>						
(U) Previous President's Budget			14,985	3,312	5,426						
(U) Adjustments to Previous President's Budget			+17	-3,123	+1,074						
(U) Current Budget Submit			15,002	189	6,500						
(U) Change Summary Explanation:											
(U) Funding: FY 1997 change is due to minor affordability adjustments.											
FY 1998 funding adjustment is due to minor affordability adjustments and realignment of C4I programs within this PE.											
FY 1999 funding adjustment is due to minor affordability adjustments.											
(U) Schedule: Not applicable.											
(U) Technical: Not applicable.											
<b>C. (U) <u>Other Program Funding Summary</u></b>			<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	To	Total
<b>(APPN, BLI #, NOMEN)</b>										<u>Compl</u>	<u>Cost</u>
(U) Not applicable.											
(U) <b>Related RDT&amp;E</b> Not applicable.											
<b>D. (U) <u>Schedule Profile</u></b> Not applicable.											
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BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0206313M Marine Corps Communications Systems				PROJECT C2277		
<b>A. (U) Project Cost Breakdown</b>				<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>				
Software Development/Integration Testing				5642	132	250				
Civilian Salaries				1840	0	778				
Program Management Support				634	0	146				
Systems Engineering PM Support				5583	0	0				
Development Support Equipment Acquisition				591	0	2585				
Test/Certification				529	0	2741				
Training				183	0	0				
SBIR				0	57	0				
Total				15002	189	6500				
<b>B. Budget Acquisition History and Planning Information</b>										
<b>Performing Organizations</b>										
Contractor or Government	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1997	FY 1997	FY 1998	FY 1999	Budget to Complete	Total Program
<b>Product Development Organizations</b>										
<b>JWID</b>										
MCTSSA, Camp Pendleton, CA	WR	Oct 96	481	481	0	238	132	0	0	481
<b>JINTACCS</b>										
Logicon, Dumfries, VA	C/CPFF	Oct 96	360	360	0	360	0	0	0	360
CECOM, Fort Monmouth, NJ	WR	Oct 96	400	400	0	400	0	0	0	400
<b>MAGTF SE&amp;I</b>										
INRI, Reston, VA	SS/CPFF	Oct 96	1618	1618	0	1618	0	0	0	1618
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BUDGET ACTIVITY					PE NUMBER AND TITLE					PROJECT
<b>7 - Operational System Development</b>					<b>0206313M Marine Corps Communications Systems</b>					<b>C2277</b>
<b>Forward Finance</b>										
INRI, Reston, VA	SS/CPFF	Oct 97	1057	1057	0	1057	0	0	0	1057
<b>Forward Finance</b>										
MCTSSA, Camp Pendleton, CA	WR	Oct 97	1082	1082	0	1082	0	0	0	1082
<b>MAGTF SE&amp;I</b>										
BTG, Vienna, VA	C/CPFF	Oct 96	798	798	0	798	0	0	0	798
Litton, SanDiego,CA	C/CPFF	Oct 96	150	150	0	150	0	0	0	150
DoD JSC, Annapolis, MD	RCP	Apr 97	0	40	0	40	0	0	0	40
<b>GCCS</b>										
NISE EAST	RCP	Jun 97	1104	1104	0	1104	0	0	0	1104
<b>JSTARS</b>										
MCTSSA, Camp Pendleton, CA	TBD	TBD	250	250	0	0	0	250	0	250
<b>Support and Management Organizations</b>										
<b>JWID</b>										
TBD					0	0	0	794	CONT	CONT
<b>JINTACCS</b>										
Logicon,Dumfries,VA	C/CPFF	Oct 96	649	649	0	649	0	0	0	649
MCTSSA, Camp Pendleton, CA	WR	Oct 96	599	599	0	599	0	0	0	599
<b>MAGTF SE&amp;I</b>										
AhnTECH, CA	C/CPFF	Feb 97	120	120	0	120	0	0	0	120
MARCORSYSCOM Quantico, VA	WR	Oct 96	532	532	0	532	0	0	0	532
Vanguard, Dumfries, VA	C/CPFF	Oct 96	100	100	0	100	0	0	0	100
CECOM, Fort Monmouth N.J.	WR	Oct 96	175	175	0	175	0	0	0	175
Robins AFB, Warner Robins, GA	RCP	Nov 96	100	100	0	100	0	0	0	100
MCCDC, Quantico, VA	WR	Oct 96	79	79	0	79	0	0	0	79
NSWC, Crane, IN	WR	Dec 96	369	369	0	369	0	0	0	369

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NAWC, Hughes	WR	Dec 96	16	16	0	16	0	0	0	16
NRAD, San Diego, CA	WR	Jun 97	150	150	0	150	0	0	0	150
MCTSSA, Camp Pendleton, CA	WR	Oct 97	953	953	0	953	0	0	0	953
<b>Forward Finance</b>	RCP	Oct 96	122	122	0	122	0	0	0	122
NAWC AD, St Inigoes, MD	C/CPFF	Oct 97	1440	1440	0	1440	0	0	0	1400
Omnibus Contract LOGICON		Oct 98			0	0	0	2787	CONT	CONT
<b>GCCS</b>										
NISE EAST, St. Inigoes, MD	RCP	Jun 97	717	717	0	717	0	0	0	717
NRAD, San Diego, CA	WR	Jun 97	300	300	0	300	0	0	0	300
<b>RHHC</b>										
NAWC/Hughes	WR	Dec 96	353	353	0	353	0	0	0	353
<b>C4I</b>										
Logicon, Dumfries, VA	C/CPFF	Oct 96	159	159	0	159	0	0	0	159
CECOM, Fort Monmouth N.J.	WR	Oct 96	204	204	0	204	0	0	0	204
MCTSSA, Camp Pendleton, CA	WR	Oct 96	9	9	0	9	0	0	0	9
Vanguard, CA	C/CPFF	Oct 96	379	379	0	379	0	0	0	379
MCCDC, Quantico, VA	WR	Oct 96	85	85	0	85	0	0	0	85
<b>Test and Evaluation Organizations</b>										
<b>MAGTF</b>										
BTG, Vienna, VA	C/CPFF	Apr 96	250	250	0	250	0	0	0	250
NISMC, Washington, DC	RCP	Jan 97	16	16	0	16	0	0	0	16
MCTSSA, Camp Pendleton, CA	WR	Oct 98			0	0	0	2669	CONT	CONT
<b>GCCS</b>										
NISE EAST, St. Inigoes, MD	RCP	Jun 97	279	279	0	279	0	0	0	279
SBIR	Various	Various	0	0	0	0	57	0	0	57

DATE  
February 1998

BUDGET ACTIVITY  
**7 - Operational System Development**

PE NUMBER AND TITLE  
**0206313M Marine Corps Communications  
Systems**

	Total Prior to <u>FY 1997</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	Budget to <u>Complete</u>	Total <u>Program</u>
Subtotal Product Development		6847	132	250	CONT	CONT
Subtotal Support and Management		7610	0	3581	CONT	CONT
Subtotal Test and Evaluation		545	0	2669	CONT	CONT
SBIR	0	0	57	0	0	57
Total Project		15002	189	6500	CONT	CONT

C. (U) Funding Profile: Not Applicable.

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<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)</b>							DATE <b>February 1998</b>		
BUDGET ACTIVITY <b>7 - Operational System Development</b>				PE NUMBER AND TITLE <b>0206313M Marine Corps Communications Systems</b>				PROJECT <b>C2278</b>	
<i>COST (In Thousands)</i>	FY 1997 Actual	FY 1998 Estimate	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	Cost to Complete	Total Cost
C2278 Air Defense Weapons Systems	787	793	2006	847	869	892	914	Continuing	Continuing
Quantity of RDT&E Articles									
<p><b>A. (U) <u>Mission Description and Budget Item Justification:</u></b>          This project encompasses two sub-element programs which are part of the Integrated Air Defense System for the Marine Corps. (1) The Expeditionary Air Defense System (EADS) is the Marine Corps' low-to-medium altitude ground based air defense system. Upgrades include mobility enhancements, expeditionary air defense improvements, and Tactical Ballistic Missile (TBM) defense modifications which are in keeping with the Marine Corps' plan to keep EADS viable until the year 2007. Primarily, the Continuous Wave Acquisition Radar (CWAR) is the only sensor organic to the Marine Corps capable of providing low altitude target acquisition in a high clutter environment. (2) The Pedestal Mounted Stinger (PMS) - Avenger provides low altitude air defense, day-night, adverse weather, shoot-on-the-move capability with gun/missile mix. Its eight ready-to-fire Stinger missiles and .50 caliber machine gun provides the Marine Corps Communications Systems with an enhanced air defense capability beyond the year 2005.</p> <p><b>PROGRAM ACCOMPLISHMENTS AND PLANS</b></p> <p><b>(U) FY 1997 Accomplishments:</b></p> <ul style="list-style-type: none"> <li>• (U) \$ 224 EADS: Continued pursuing Engineering Change Proposals (ECP) for correcting hardware and software deficiencies thereby maintaining CWAR system viability. Currently scheduled ECPs include Identification Friend or Foe/Continuous Wave Acquisition Radar (IFF/CWAR) integration, CWAR False First Hits, CWAR Bite diagnostics.</li> <li>• (U) \$ 563 PMS-Avenger: Upgraded Passive Sensor (Acoustic) and further develop electronic support measures (ESM) Passive Sensor and Forward Looking Infrared Receiver (FLIR) target identification capability; initially look toward integration of the Block I Upgrade Stinger Missile. Achieve MS III decision for Block I upgrade to Avenger.</li> </ul> <p>(U)Total \$ 787</p> <p><b>(U) FY 1998 Planned Program:</b></p> <ul style="list-style-type: none"> <li>• (U) \$ 769 EADS: Continue pursuing ECPs for correcting hardware and software deficiencies thereby maintaining CWAR system viability.</li> <li>• (U) \$ 24 SBIR: Portion of program reserved for Small Business Innovation Research assessment in accordance with 15 U.S.C. 638 (f) (1).</li> </ul> <p>(U)Total \$ 793</p>									
Project C2278			Page 169 - 64 of 169 - 75 Pages				Exhibit R-2		



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<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)</b>							DATE <b>February 1998</b>																																																												
<b>BUDGET ACTIVITY</b> <b>7 - Operational System Development</b>				<b>PE NUMBER AND TITLE</b> <b>0206313M Marine Corps Communications Systems</b>			<b>PROJECT</b> <b>C2278</b>																																																												
<p><b>(U) FY 1999 Planned Program:</b></p> <ul style="list-style-type: none"> <li>• (U) \$ 838 EADS: Continue pursuing ECPs for correcting hardware and software deficiencies thereby maintaining CWAR system viability.</li> <li>• (U) \$ 1168 Identification Friend or Foe (IFF) continuous wave acquisition radar integration.</li> </ul> <p>(U)Total \$ 2006</p>																																																																			
<p><b>B. (U) Project Change Summary</b></p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 40%;"></th> <th style="text-align: center;"><u>FY 1997</u></th> <th style="text-align: center;"><u>FY 1998</u></th> <th style="text-align: center;"><u>FY 1999</u></th> </tr> </thead> <tbody> <tr> <td>(U) Previous President's Budget</td> <td style="text-align: center;">809</td> <td style="text-align: center;">817</td> <td style="text-align: center;">838</td> </tr> <tr> <td>(U) Adjustments to Previous President's Budget</td> <td style="text-align: center;">-22</td> <td style="text-align: center;">-24</td> <td style="text-align: center;">+1168</td> </tr> <tr> <td>(U) Current Budget Submit</td> <td style="text-align: center;">787</td> <td style="text-align: center;">793</td> <td style="text-align: center;">2006</td> </tr> </tbody> </table> <p>(U) Change Summary Explanation:</p> <p style="padding-left: 20px;">(U) Funding: FY 1997 changes due to minor affordability adjustments.            Funding: FY 1998 changes due to minor affordability adjustments.            Funding: FY 1999 changes due to minor affordability adjustments and an adjustment to EADS IFF/CWAR.</p> <p style="padding-left: 20px;">(U) Schedule: N/A</p> <p style="padding-left: 20px;">(U) Technical: N/A</p>									<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	(U) Previous President's Budget	809	817	838	(U) Adjustments to Previous President's Budget	-22	-24	+1168	(U) Current Budget Submit	787	793	2006																																												
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<p><b>C. (U) Other Program Funding Summary</b></p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;"></th> <th style="text-align: center;"><u>FY 1997</u></th> <th style="text-align: center;"><u>FY 1998</u></th> <th style="text-align: center;"><u>FY 1999</u></th> <th style="text-align: center;"><u>FY 2000</u></th> <th style="text-align: center;"><u>FY 2001</u></th> <th style="text-align: center;"><u>FY 2002</u></th> <th style="text-align: center;"><u>FY 2003</u></th> <th style="text-align: center;">To</th> <th style="text-align: center;">Total</th> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <th style="text-align: center;"><u>Compl</u></th> <th style="text-align: center;"><u>Cost</u></th> </tr> </thead> <tbody> <tr> <td>(U) PMC LINE BLI 300600 HAWK MOD</td> <td style="text-align: center;">2,775</td> <td style="text-align: center;">3,395</td> <td style="text-align: center;">981</td> <td style="text-align: center;">1,534</td> <td style="text-align: center;">1,575</td> <td style="text-align: center;">1,619</td> <td style="text-align: center;">1,666</td> <td style="text-align: center;">CONT</td> <td style="text-align: center;">CONT</td> </tr> <tr> <td>(U) PMC LINE BLI 301300 PMS-AVENGER</td> <td style="text-align: center;">10,552</td> <td style="text-align: center;">4,121</td> <td style="text-align: center;">218</td> <td style="text-align: center;">224</td> <td style="text-align: center;">230</td> <td style="text-align: center;">3,578</td> <td style="text-align: center;">3,773</td> <td style="text-align: center;">CONT</td> <td style="text-align: center;">CONT</td> </tr> <tr> <td>(U) O&amp;M EADS/HAWK</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">CONT</td> <td style="text-align: center;">CONT</td> </tr> <tr> <td>(U) O&amp;M AVENGER</td> <td style="text-align: center;">5</td> <td style="text-align: center;">615</td> <td style="text-align: center;">1,214</td> <td style="text-align: center;">1,247</td> <td style="text-align: center;">1,280</td> <td style="text-align: center;">1,304</td> <td style="text-align: center;">1,350</td> <td style="text-align: center;">CONT</td> <td style="text-align: center;">CONT</td> </tr> </tbody> </table>									<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	To	Total									<u>Compl</u>	<u>Cost</u>	(U) PMC LINE BLI 300600 HAWK MOD	2,775	3,395	981	1,534	1,575	1,619	1,666	CONT	CONT	(U) PMC LINE BLI 301300 PMS-AVENGER	10,552	4,121	218	224	230	3,578	3,773	CONT	CONT	(U) O&M EADS/HAWK	0	0	0	0	0	0	0	CONT	CONT	(U) O&M AVENGER	5	615	1,214	1,247	1,280	1,304	1,350	CONT	CONT
	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	To	Total																																																										
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<p><b>(U) Related RDT&amp;E</b>  <b>PE 0603216C (Ballistic Missile Defense Organization, Theater Missile Defense)</b></p>																																																																			
Project C2278		Page 169 - 65 of 169 - 75 Pages				Exhibit R-2																																																													

<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)</b>		DATE <b>February 1998</b>
BUDGET ACTIVITY <b>7 - Operational System Development</b>	PE NUMBER AND TITLE <b>0206313M Marine Corps Communications Systems</b>	PROJECT <b>C2278</b>

**D. (U) Schedule Profile**

## AVENGER

ID	TASK NAME	DURATION	97				98				99				00				01			
			QTR				QTR				QTR				QTR				QTR			
			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1	ICOFT S/W UPGRADE	174d																				
2	AVENGER OBSOLESC.	108d																				
3	AVENGER EADS S/W	282d																				

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)						DATE				
BUDGET ACTIVITY						February 1998				
7 - Operational System Development						PROJECT				
PE NUMBER AND TITLE						C2278				
0206313M Marine Corps Communications Systems										
<b>A. (U) Project Cost Breakdown</b>				<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>				
Project Management Support				91	92	192				
Software Development				506	482	998				
SBIR				0	24	0				
Systems Engineering				190	195	816				
Total				787	793	2006				
<b>B. Budget Acquisition History and Planning Information</b>										
<b>Performing Organizations</b>										
Contractor or Government	Contract Method/Type	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1997	FY 1997	FY 1998	FY 1999	Budget to Complete	Total Program
<b>Product Development Organizations</b>										
MICOM	C/CPFF	MAY 97			0	696	679	1817	CONT	CONT
<b>Redstone Arsenal, AL</b>										
<b>Support and Management Organizations</b>										
MCSC, Quantico	WR	OCT96			0	91	90	189	CONT	CONT
VA										
SBIR	VARIOUS	VARIOUS	122	1220	0	0	24	0	0	24
<b>Test and Evaluation Organizations</b>										
					Total Prior to FY 1997	FY 1997	FY 1998	FY 1999	Budget to Complete	Total Program
Subtotal Product Development					0	696	679	1817	CONT	CONT
Subtotal Support and Management					0	91	114	189	CONT	CONT
Subtotal Test and Evaluation					0	0	0	0	0	0
Total Project					0	787	793	2006	CONT	CONT
Project C2278				Page 169 - 67 of 169 - 75 Pages				Exhibit R-3		

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<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)</b>							DATE <b>February 1998</b>			
BUDGET ACTIVITY <b>7 - Operational System Development</b>				PE NUMBER AND TITLE <b>0206313M Marine Corps Communications Systems</b>				PROJECT <b>C2315</b>		
COST <i>(In Thousands)</i>	FY 1997 Actual	FY 1998 Estimate	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	Cost to Complete	Total Cost	
C2315 Training Devices/Simulators	3221	8233	9933	10180	10073	6484	5117	Continuing	Continuing	
Quantity of RDT&E Articles										
<p><b>A. (U) <u>Mission Description and Budget Item Justification:</u></b></p> <p>(U) Training simulators supported by this program element include the Marine Air Ground Task Force (MAGTF) Tactical Warfare Simulation (MTWS), Joint Simulation System (JSIMS) and Range Instrumentation Systems (RIS). These training systems provide tactical weapons and decision-making skill training from entity level through MAGTF staff level. Together these systems will be interoperable and will allow for mission planning, mission rehearsal and concept evaluation in a valid synthetic environment with objective, timely feedback. Through live, virtual and constructive simulation, the Marine Corps will have the means to train jointly, educate, develop doctrine and tactics; formulate and assess operational plans, assess warfighting situations and define operational requirements.</p> <p><b>(U) PROGRAM ACCOMPLISHMENTS AND PLANS:</b></p> <p><b>(U) FY 1997 Accomplishments:</b></p> <ul style="list-style-type: none"> <li>• (U) \$ 1,206 MTWS: Upgraded resident software to achieve improved tactical simulation, man-machine interface; scenario generation, and tactical planning capabilities.</li> <li>• (U) \$ 1,073 MTWS: Achieved an intermediate level of Distributed Interactive Exercise Capabilities and Joint/Combined simulations interoperability and explored telecommunications options.</li> <li>• (U) \$ 942 MTWS: Continued to refine and enhance at intermediate levels, the integration into the Unified Build of Joint/Naval C3I systems. Emphasized Common Tactical Message Protocols and automated intelligence interfaces.</li> </ul> <p>(U)Total \$ 3,221</p>										
Project C2315			Page 169 - 68 of 169 - 75 Pages				Exhibit R-2			

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<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)</b>		DATE <b>February 1998</b>
<b>BUDGET ACTIVITY</b> <b>7 - Operational System Development</b>	<b>PE NUMBER AND TITLE</b> <b>0206313M Marine Corps Communications Systems</b>	<b>PROJECT</b> <b>C2315</b>
<b>(U) FY 1998 Planned Program:</b>		
<ul style="list-style-type: none"> <li>• (U) \$ 6,044 JSIMS: Provide technical development expertise to the US Army, US Navy and US Air Force in the development of the Marine Corps unique specific simulation requirements within the JSIMS Land, Maritime, and Air/Space Domains.</li> <li>• (U) \$ 1,028 JSIMS: Provide Marine Corps funding to CECOM office to provide for the development of the USMC input into the Joint Conceptual Model of the Mission Space and provide the requirements to interface JSIMS with Marine Corps ground simulators..</li> <li>• (U) \$ 170 JSIMS: Provide Marine Corps funding to CECOM office to provide for an USMC annex to the JSIMS Test and Evaluation Master Plan.</li> <li>• (U) \$ 430 JSIMS: Provide Marine Corps funding to Naval Air Warfare Center to provide for the development of the USMC input into the Joint Conceptual Model of the Mission Space..</li> <li>• (U) \$ 300 RIS: Define After Action Report (AAR) software capabilities.</li> <li>• (U) \$ 261 SBIR: Portion of program reserved for Small Business Innovation Research assessment in accordance with 15 U.S.C. 638 (f) (1).</li> <li>(U)Total \$ 8,233</li> </ul>		
<b>(U) FY 1999 Planned Program:</b>		
<ul style="list-style-type: none"> <li>• (U) \$ 7148 JSIMS: Continue to provide technical development expertise to the US Army, US Navy and US Air Force in the development of the Marine Corps unique specific simulation requirements within the JSIMS Land, Maritime, and Air/Space Domains..</li> <li>• (U) \$ 940 JSIMS: Continue Marine Corps funding to CECOM office to provide for the development of the USMC input into the Joint Conceptual Model of the Mission Space..</li> <li>• (U) \$ 445 JSIMS: Continue Marine Corps funding to Naval Air Warfare Center to provide for the development of the USMC input into the Joint Conceptual Model of the Mission Space..</li> <li>• (U) \$ 650 JSIMS: Provide funding to the Marine Corps Operational Test and Evaluation Center to provide initial support to the JSIMS Operational Test and Evaluation.</li> <li>• (U) \$ 750 RIS: Continue /complete AAR development and begin development of interface with C4I systems and existing US Army instrumented ranges. Develop integration of virtual and constructive simulations with other functional (air, surface, and ground) instrumentation capabilities.</li> <li>(U)Total \$ 9,933</li> </ul>		
<b>B. (U) <u>Project Change Summary</u></b>		
	<u>FY 1997</u>	<u>FY 1998</u>
		<u>FY 1999</u>
Project C2315	Page 169 - 69 of 169 - 75 Pages	Exhibit R-2

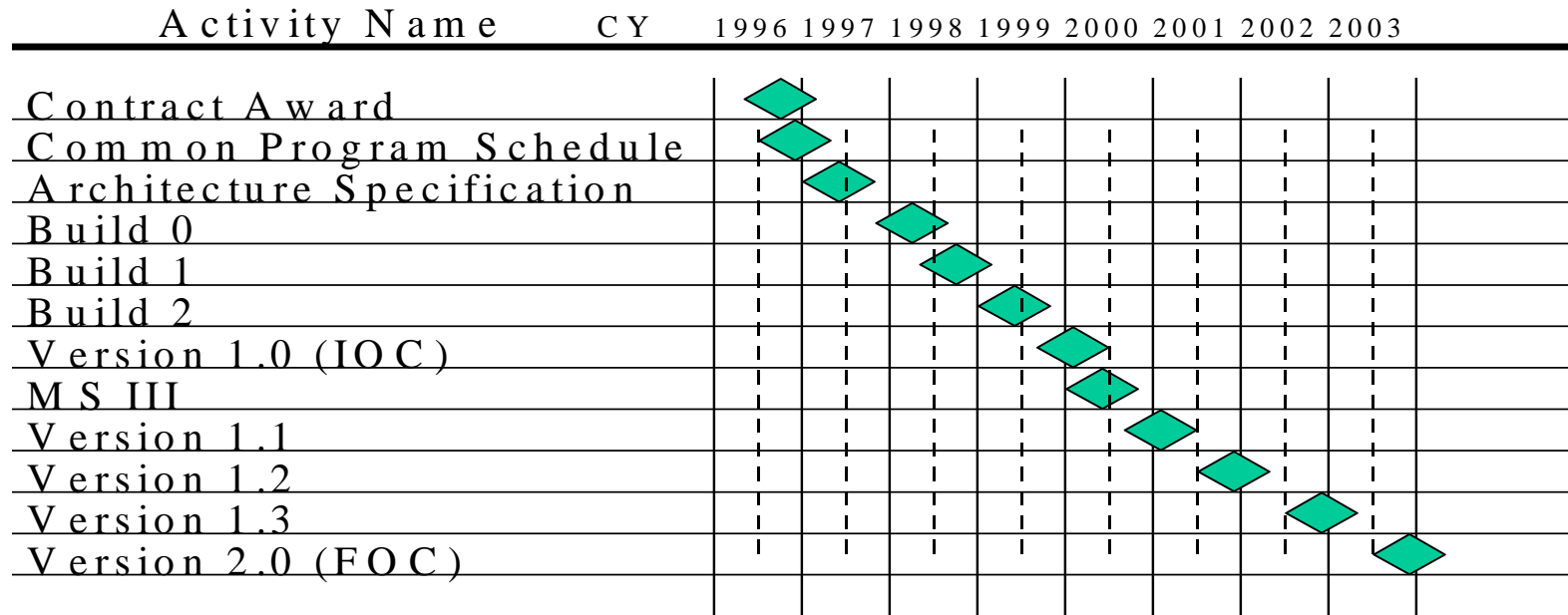
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<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)</b>							DATE <b>February 1998</b>				
BUDGET ACTIVITY <b>7 - Operational System Development</b>				PE NUMBER AND TITLE <b>0206313M Marine Corps Communications Systems</b>			PROJECT <b>C2315</b>				
<b>B. (U) <u>Project Change Summary</u></b>				<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>					
(U) Previous President's Budget				3,285	10,772	11,151					
(U) Adjustments to Previous President's Budget				-64	-2,539	-1,218					
(U) Current Budget Submit				3,221	8,233	9,933					
 (U) Change Summary Explanation:											
(U) Funding: FY 1997, FY 1998, and FY 1999 decreases reflect various economic adjustments such as, SBIR, NWCF, general R&D reductions and inflation.											
(U) Schedule: N/A											
(U) Technical: N/A											
<b>C. (U) <u>Other Program Funding Summary</u></b>			<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	To	Total
<b>(APPN, BLI #, NOMEN)</b>										<u>Compl</u>	<u>Cost</u>
(U) PMC, 653200, Training Devices/Simulators			50,667	5,801	3,305	22,541	21,525	40,785	51,570	CONT	CONT
 (U) <b>Related RDT&amp;E:</b> PE 0603832D, Joint Simulation Management											

<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)</b>		DATE <b>February 1998</b>
BUDGET ACTIVITY <b>7 - Operational System Development</b>	PE NUMBER AND TITLE <b>0206313M Marine Corps Communications Systems</b>	PROJECT <b>C2315</b>

D. (U) Schedule Profile

## JSIM S Major Milestones



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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)						DATE February 1998				
BUDGET ACTIVITY <b>7 - Operational System Development</b>				PE NUMBER AND TITLE <b>0206313M Marine Corps Communications Systems</b>				PROJECT <b>C2315</b>		
<b>A. (U) <u>Project Cost Breakdown</u></b>				<u>FY1997</u>	<u>FY1998</u>	<u>FY1999</u>				
Subtotal Product Development				2508	6044	5643				
Subtotal Support and Management				713	2189	3465				
Subtotal Test and Evaluation					0	650				
Total Project				3221	8233	9933				
<b><u>B. Budget Acquisition History and Planning Information</u></b>										
<b>Performing Organizations</b>										
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 1997	FY 1997	FY 1998	FY 1999	Budget to Complete	Total Program
<b>Product Development Organizations</b>										
VISICOM, Labs, Inc. San Diego, CA	RCP	NOV 96	N/A	N/A	N/A	2508	6044	5643	CONT	CONT
<b>Support and Management Organizations</b>										
NRaD, San Diego, CA	WR	DEC 96	N/A	N/A	N/A	434	0	1386	CONT	CONT
CECOM, Ft. Monmouth, NJ	MIPR	NOV 96	N/A	N/A	N/A	186	1198	940	CONT	CONT
Naval Air Warfare Center, Orlando, FL	WR	NOV 97	N/A	N/A	N/A	0	0	110	CONT	CONT
MCTSSA, Camp Pendleton, CA	WR	NOV 96	N/A	N/A	N/A	93	0	0	0	93
UNITECH, Orlando, FL	RCP	NOV 97	N/A	N/A	N/A	0	300	759	CONT	CONT
Project C2315				Page 169 - 72 of 169 - 75 Pages				Exhibit R-3		



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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1998	
BUDGET ACTIVITY <b>7 - Operational System Development</b>					PE NUMBER AND TITLE <b>0206313M Marine Corps Communications Systems</b>					PROJECT <b>C2315</b>	
Naval Air Warfare											
Center Orlando Fl	RCP	NOV 97	N/A	N/A	N/A	0	430	445	CONT	CONT	
Misc SBIR	TBD	TBD	0	0	0	0	261	0	0	0	
<b>Test and Evaluation</b>											
MCOTEA											
Quantico, Va	RCP	NOV 97	N/A	N/A	N/A	0	0	650	CONT	CONT	
<b>Government Furnished Property</b>											
Contract											
Item	Method/Type	Award or			Total					Budget to	Total
Description	Vehicle	Date	Delivery	Date	Prior to	FY 1997	FY 1998	FY 1999		Complete	Program
<b>Product Development Property</b>											
N/A											
<b>Support and Management Property</b>											
N/A											
<b>Test and Evaluation Property</b>											
N/A											
						Total					
						Prior to				Budget to	Total
						FY 1997	FY 1997	FY 1998	FY 1999	Complete	Program
Subtotal Product Development							2508	6044	5643	CONT	CONT
Subtotal Support and Management							713	2189	3640	CONT	CONT
Subtotal Test and Evaluation							0	0	650	CONT	CONT
Total Project							3221	8233	9933	CONT	CONT
<b>C. Funding Profile:</b> Not Applicable											

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<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)</b>							DATE <b>February 1998</b>																		
<b>BUDGET ACTIVITY</b> <b>7 - Operational System Development</b>				<b>PE NUMBER AND TITLE</b> <b>0206313M Marine Corps Communications Systems</b>				<b>PROJECT</b> <b>C2317</b>																	
COST (In Thousands)	FY 1997 Actual	FY 1998 Estimate	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	Cost to Complete	Total Cost																
C2317 ASCIET	0	0	1351	1393	1439	1483	1532	Continuing	Continuing																
Quantity of RDT&E Articles																									
<p><b>A. (U) <u>Mission Description and Budget Item Justification:</u></b> All Service Combat Identification Evaluation Team (ASCIET) conducts multi-service tactical air-to-air and surface-to-air evaluations, examines air-to-surface and surface-to-surface combat identification capabilities and provides an environment to exercise and examine developmental combat identification systems. USMC participation in ASCIET is mandated by an existing all service MOA (940914).</p> <p><b>(U) PROGRAM ACCOMPLISHMENTS AND PLANS:</b></p> <p><b>(U) FY 1997 Accomplishments:</b> This program is contained in P.E. 0206623M</p> <p><b>(U) FY 1998 Planned Program:</b> This program is contained in P.E. 0206623M</p> <p><b>(U) FY 1999 Planned Program:</b></p> <ul style="list-style-type: none"> <li>• (U) \$ 51 Support and management to monitor and participate in the developments of the Joint Program.</li> <li>• (U) \$ 1300 Direct support of ASCIET to conduct yearly combat identification evaluations.</li> </ul> <p>(U)Total \$ 1351</p>																									
<p><b>B. (U) <u>Project Change Summary</u></b></p> <table style="width:100%; border: none;"> <thead> <tr> <th style="width: 40%;"></th> <th style="text-align: center;"><u>FY 1997</u></th> <th style="text-align: center;"><u>FY 1998</u></th> <th style="text-align: center;"><u>FY 1999</u></th> </tr> </thead> <tbody> <tr> <td>(U) Previous President's Budget</td> <td align="right">0</td> <td align="right">0</td> <td align="right">0</td> </tr> <tr> <td>(U) Adjustments to Previous President's Budget</td> <td align="right">0</td> <td align="right">0</td> <td align="right">1351</td> </tr> <tr> <td>(U) Current Budget Submit</td> <td align="right">0</td> <td align="right">0</td> <td align="right">1351</td> </tr> </tbody> </table> <p>(U) Change Summary Explanation:            (U) Funding: FY 1999 adjustment is due to the realignment of ASCIET into this PE from PE 0206623M, Marine Corps Ground Combat/Supporting Arms Systems, Project C2317.</p>											<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	(U) Previous President's Budget	0	0	0	(U) Adjustments to Previous President's Budget	0	0	1351	(U) Current Budget Submit	0	0	1351
	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>																						
(U) Previous President's Budget	0	0	0																						
(U) Adjustments to Previous President's Budget	0	0	1351																						
(U) Current Budget Submit	0	0	1351																						
Project C2317			Page 169 - 74 of 169 - 75 Pages				Exhibit R-2																		

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)								DATE February 1998	
BUDGET ACTIVITY	PE NUMBER AND TITLE						PROJECT		
<b>7 - Operational System Development</b>	<b>0206313M Marine Corps Communications Systems</b>						<b>C2317</b>		
<p>(U) Schedule: N/A</p> <p>(U) Technical: N/A</p>									
<b>C. (U) <u>Other Program Funding Summary</u></b>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>To</u>	<u>Total</u>
(U) N/A								<u>Compl</u>	<u>Cost</u>
<p>(U) <b>Related RDT&amp;E</b></p> <p>(U) PE 0604817A</p> <p>(U) PE 0604719M, Marine Corps Command/Control/Communications Systems.</p>									
<p><b>D. (U) <u>Schedule Profile:</u></b> Not Applicable.</p>									

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<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)</b>							DATE <b>FEBRUARY 1998</b>		
<b>BUDGET ACTIVITY</b> <b>7 - Operational System Development</b>				<b>PE NUMBER AND TITLE</b> <b>0206623M Marine Corps Ground Combat/Supporting Arms Systems</b>					
<i>COST (In Thousands)</i>	FY 1997 Actual	FY 1998 Estimate	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	9557	13699	14699	13809	13819	12232	12120	Continuing	Continuing
C0021 Assault Amphibious Vehicle 7A1 (AAV7A1)	2104	331	273	396	406	357	366	Continuing	Continuing
C1555 Light Armored Vehicle (LAV) PIP	1403	1768	1626	2687	4382	4463	4554	Continuing	Continuing
C1901 Marine Corps Ground Weaponry PIP	1421	6313	7661	5228	3373	2007	2063	Continuing	Continuing
C2086 Marine Enhancement Program	1766	2399	3174	3483	3589	3287	2961	Continuing	Continuing
C2237 Amphibious Vehicle Test Branch	1650	1596	1965	2015	2069	2118	2176	Continuing	Continuing
C2317 ASCIET	1213	1292	0	0	0	0	0	0	0
Quantity of RDT&E Articles									
<p><b>(U) <u>Mission Description and Budget Item Justification:</u></b></p> <p><b>(U) <u>Justification for Budget Activity:</u></b></p>									

**UNCLASSIFIED**

<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)</b>							DATE <b>FEBRUARY 1998</b>			
BUDGET ACTIVITY <b>7 - Operational System Development</b>				PE NUMBER AND TITLE <b>0206623M Marine Corps Ground Combat/Supporting Arms Systems</b>				PROJECT <b>C0021</b>		
COST <i>(In Thousands)</i>	FY 1997 Actual	FY 1998 Estimate	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	Cost to Complete	Total Cost	
C0021 Assault Amphibious Vehicle 7A1 (AAV7A1)	2104	331	273	396	406	357	366	Continuing	Continuing	
Quantity of RDT&E Articles										

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

(U) This program was formerly titled AAV7A1 program. The AAV7A1 Modification Kits Sustainment Program provides for the development and fielding of reliability and safety improvements to the AAV7A1 family of vehicles. In conjunction with this effort is the integration of the Single Channel Ground-Air Radio System (SINGARS) radios, Improved Transmission/Improved Reliability and Maintainability (ITRANS/IRAM) transmission and upgraded engine and suspension efforts, providing direct improvements to the current fleet. Included is engineering support for the integration of Bradley Fighting Vehicle suspension and engine into AAV (RAM Program), and emerging improvements in Command and Control.

**(U) FY 1997 Accomplishments:**

- (U) \$ 1198 Continued Bradley Fighting Vehicles (BFV) engines integration into the USMC AAV7A1 family of vehicles.
- (U) \$ 556 Continued Engineering Support regarding reliability and safety related modifications.
- (U) \$ 280 Continued various dyno-testing on Bradley Fighting Vehicles engines for incorporation into the AAV7A1 family of vehicles.
- (U) \$ 55 Completed water operations testing at AVTB.
- (U) \$ 15 Continued supporting R&D vehicles.

(U)Total \$ 2,104

**(U) FY 1998 Planned Program:**

- (U) \$ 322 Continue providing engineering support for reliability and safety related improvements and modifications, and RAM program.
- (U) \$ 9 SBIR: Portion of program reserved for Small Business Innovation Research assessment in accordance with 15 U.S.C. 638 (f) (1).

(U)Total \$ 331

**(U) FY 1999 Planned Program:**

- (U) \$ 273 Continue providing engineering support for reliability and safety related improvements and modifications.

(U)Total \$ 273

Project C0021 Page 170 - 2 of 170 - 25 Pages Exhibit R-2

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<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)</b>							DATE <b>FEBRUARY 1998</b>				
BUDGET ACTIVITY <b>7 - Operational System Development</b>				PE NUMBER AND TITLE <b>0206623M Marine Corps Ground Combat/Supporting Arms Systems</b>				PROJECT <b>C0021</b>			
<b>B. (U) <u>Project Change Summary</u></b>				<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>					
(U) Previous President's Budget				922	249	277					
(U) Adjustments to Previous President's Budget				1,182	82	-4					
(U) Current Budget Submit				2,104	331	273					
(U) Change Summary Explanation:											
(U) Funding: Increase of \$1,182 in FY 97 is for Bradley Fighting Vehicle engine and suspension integration (RAM Program). Increase of \$82 in FY 98 is for DT related to the RAM program. Decrease of \$4K in FY 99 is due to minor affordability changes.											
(U) Schedule: N/A											
(U) Technical: N/A											
<b>C. (U) <u>Other Program Funding Summary</u></b>			<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	To	Total
<b>(APPN, BLI #, NOMEN)</b>											
(U) PMC, 202100, AAV PIP			10,927	13,191	89,934	79,857	81,234	72,847	2,498	<u>Compl</u>	<u>Cost</u>
(U) PMC, 206300, Modification Kits (Track Veh)			319	4,373	5,726	20,633	16,231	18,949	2,007	Cont.	Cont.
(U) <b>Related RDT&amp;E:</b> PE 0603611M (Marine Corps Assault Vehicles)											
<b>D. (U) <u>Schedule Profile:</u></b> N/A											
Project C0021			Page 170 - 3 of 170 - 25 Pages					Exhibit R-2			

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)						DATE FEBRUARY 1998				
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0206623M Marine Corps Ground Combat/Supporting Arms Systems					PROJECT C0021	
<b>A. (U) Project Cost Breakdown</b>				<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>				
ECP Support				130	0	0				
Product Development				1,338	131	11				
Contractor Engineering Support				593	140	247				
Government Engineering Support				14	0	0				
Program Management Support				15	60	15				
Misc				14	0	0				
Total				2,104	331	273				
<b>B. Budget Acquisition History and Planning Information</b>										
<b>Performing Organizations</b>										
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 1997	FY 1997	FY 1998	FY 1999	Budget to Complete	Total Program
<b>Product Development Organizations</b>										
TACOM, Warren, MI	MIPR	Various	20,266	20,266	18,797	1,352	117	0	0	20,266
MCLB, Albany, GA	WR	Various	1,599	1,599	1,584	15	0	0	0	1,599
MISC (MCCDC, Quantico, VA and MCLB Barstow, CA)	Various	Various	N/A	N/A	2,452	130	40	10	Cont.	Cont.
<b>Support and Management Organizations</b>										
AERA, Dumfries, VA	CPFF	Various	1,771	1,771	944	440	140	247	0	1,771
General Dynamics, Warren, MI	RCP	Various	20	20	0	20	0	0	0	20
Project C0021				Page 170 - 4 of 170 - 25 Pages				Exhibit R-3		

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE FEBRUARY 1998
BUDGET ACTIVITY					PE NUMBER AND TITLE					PROJECT
<b>7 - Operational System Development</b>					<b>0206623M Marine Corps Ground Combat/Supporting Arms Systems</b>					<b>C0021</b>
AV Tech, Chesterfield, MI	RCP	Various	20	20	0	20	0	0	0	20
ISI, Philadelphia, PA	CPFF	Various	113	113	0	113	0	0	0	113
Misc	TBD	Various	154	154	0	14	34	16	90	154
<b>Test and Evaluation Organizations</b> Not Applicable										
<b>Government Furnished Property</b>										
Item	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Delivery Date	Total Prior to FY 1997	FY 1997	FY 1998	FY 1999	Budget to Complete	Total Program	
<b>Product Development Property</b> Not Applicable										
<b>Support and Management Property</b> Not Applicable										
<b>Test and Evaluation Property</b> Not Applicable										
					Total Prior to FY 1997	FY 1997	FY 1998	FY 1999	Budget to Complete	Total Program
Subtotal Product Development					22,833	1,497	157	10	Cont.	Cont.
Subtotal Support and Management					944	607	174	263	Cont.	Cont.
Subtotal Test and Evaluation					0	0	0	0		0
Total Project					23,777	2,104	331	273		Cont.



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<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)</b>							DATE <b>FEBRUARY 1998</b>			
BUDGET ACTIVITY <b>7 - Operational System Development</b>				PE NUMBER AND TITLE <b>0206623M Marine Corps Ground Combat/Supporting Arms Systems</b>				PROJECT <b>C1555</b>		
<i>COST (In Thousands)</i>	FY 1997 Actual	FY 1998 Estimate	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	Cost to Complete	Total Cost	
C1555 Light Armored Vehicle (LAV) PIP	1403	1768	1626	2687	4382	4463	4554	Continuing	Continuing	
Quantity of RDT&E Articles										

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

(U) The family of LAVs consists of six fielded configurations with operational capabilities providing significant enhancement to the mobility and firepower of the Marine Air-Ground Task Force (MAGTF). Since the original urgency of need dictated the fielding of essentially off-the-shelf vehicles, this project provides the resources to evaluate, develop, and test designated pre-planned product improvements. This program has the single goal of ensuring the maximum reliability/capability for the fielded family of LAVs.

**(U) FY 1997 Accomplishments:**

- (U) \$ 650 Initiated Study and Development of the Light Armored Combat System/LAV PIP/SLEP.
- (U) \$ 403 Continued Evaluation of Current LAV Safety/Survivability, Maintainability, and Readiness Enhancements.
- (U) \$ 350 Continued Evaluation of Current LAV Performance Capabilities Improvements.

(U)Total \$ 1,403

**(U) FY 1998 Planned Program:**

- (U) \$ 961 Continue Study and Development of the Light Armored Combat System/LAV PIP/SLEP.
- (U) \$ 425 Continue Evaluation of Current LAV Safety/Survivability, Maintainability, and Readiness Enhancements.
- (U) \$ 373 Continue Evaluation of Current LAV Performance Capabilities Improvements.
- (U) \$ 9 SBIR: Portion of program reserved for Small Business Innovation Research assessment in accordance with 15 U.S.C. 638 (f)(1).

(U)Total \$ 1,768

**(U) FY 1999 Planned Program:**

Project C1555 Page 170 - 6 of 170 - 25 Pages Exhibit R-2

**UNCLASSIFIED**

<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)</b>		DATE <b>FEBRUARY 1998</b>							
<b>BUDGET ACTIVITY</b> <b>7 - Operational System Development</b>	<b>PE NUMBER AND TITLE</b> <b>0206623M Marine Corps Ground Combat/Supporting Arms Systems</b>	<b>PROJECT</b> <b>C1555</b>							
<ul style="list-style-type: none"> <li>• (U) \$ 968 Continue Study and Development of the Light Armored Combat System/LAV PIP/SLEP.</li> <li>• (U) \$ 343 Continue Evaluation of Current LAV Safety/Survivability, Maintainability, and Readiness Enhancements.</li> <li>• (U) \$ 315 Continue Evaluation of Current LAV Performance Capabilities Improvements.</li> </ul> <p>(U)Total \$ 1,626</p>									
<b>B. (U) <u>Project Change Summary</u></b>									
	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>						
(U) Previous President's Budget	1357	1875	1920						
(U) Adjustments to Previous President's Budget	46	-107	-294						
(U) Current Budget Submit	1403	1768	1626						
(U) Change Summary Explanation:									
(U) Funding: FY 1997 adjustments reflect below threshold reprogramming. FY 1998 reduction reflects general reductions, SBIR and economic assumptions. FY 1999 reduction reflects downsizing of LAV-Test Directorate at Yuma, AZ and commercial purchase inflation adjustment.									
(U) Schedule: Not applicable.									
(U) Technical: Not applicable.									
<b>C. (U) <u>Other Program Funding Summary</u></b>									
	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>To</u>	<u>Total</u>
								<u>Compl</u>	<u>Cost</u>
(U) PMC, 203800, LAV PIP	15567	586	1384	1665	1285	1612	9983	<u>Cont.</u>	<u>Cont.</u>
(U) PMC, 203900, LAV (Air Defense)	0	6541	0	0	0	0	0	0	81152
(U) <b>Related RDT&amp;E:</b> Not applicable.									
<b>D. (U) <u>Schedule Profile:</u></b> Not applicable.									
Project C1555			Page 170 - 7 of 170 - 25 Pages				Exhibit R-2		

**UNCLASSIFIED**

<b>RDT&amp;E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)</b>							DATE <b>FEBRUARY 1998</b>			
BUDGET ACTIVITY <b>7 - Operational System Development</b>					PE NUMBER AND TITLE <b>0206623M Marine Corps Ground Combat/Supporting Arms Systems</b>				PROJECT <b>C1555</b>	
<b>A. (U) <u>Project Cost Breakdown</u></b>										
				<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>				
Product Development				558	838	945				
Support Cost and Management				679	647	581				
Test and Evaluation				166	283	100				
Total				1403	1768	1626				
 <b>B. <u>Budget Acquisition History and Planning Information</u></b>										
<b>Performing Organizations</b>										
Contractor or Government	Contract Method/Type	Award or Obligation	Performing Activity	Project Office	Total Prior to				Budget to	Total
<u>Activity</u>	<u>Vehicle</u>	<u>Date</u>	<u>EAC</u>	<u>EAC</u>	<u>FY 1997</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>Complete</u>	<u>Program</u>
<b>Product Development Organizations</b>										
Delco Electronics	FFP	Apr 97	N/A	N/A	0	25	50	250	CONT	CONT
Dies Div, GM	C/FF	June 97	N/A	N/A	0	312	303	300	CONT	CONT
Hupp In	FFP	May 97	35	35	15	20	0	0	35	35
Other	Various	Various	N/A	N/A	9119	201	485	395	CONT	CONT
<b>Support and Management Organizations</b>										
In-house Support	WR	1 <sup>st</sup> Qtr	N/A	N/A	22043	679	647	581	CONT	CONT
<b>Test and Evaluation Organizations</b>										
Other (LAV Test Dir/YumaPrvGrd)	WR	Various	N/A	N/A	4171	166	283	100	CONT	CONT

DATE  
**FEBRUARY 1998**

BUDGET ACTIVITY  
**7 - Operational System Development**

PE NUMBER AND TITLE  
**0206623M Marine Corps Ground  
Combat/Supporting Arms Systems**

**Government Furnished Property**

Item Description	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Delivery Date	Total				Budget to Complete	Total Program
				Prior to FY 1997	FY 1997	FY 1998	FY 1999		
<b>Product Development Property</b>									
		N/A							
<b>Support and Management Property</b>									
		N/A							
<b>Test and Evaluation Property</b>									
		N/A							

	Total Prior to FY 1997	FY 1997	FY 1998	FY 1999	Budget to Complete	Total Program
Subtotal Product Development	9134	558	838	945	CONT	CONT
Subtotal Support and Management	22043	679	647	581	CONT	CONT
Subtotal Test and Evaluation	4171	166	283	100	CONT	CONT
Total Project	35348	1403	1768	1626	CONT	CONT

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<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)</b>							DATE <b>FEBRUARY 1998</b>			
BUDGET ACTIVITY <b>7 - Operational System Development</b>				PE NUMBER AND TITLE <b>0206623M Marine Corps Ground Combat/Supporting Arms Systems</b>				PROJECT <b>C1901</b>		
COST <i>(In Thousands)</i>	FY 1997 Actual	FY 1998 Estimate	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	Cost to Complete	Total Cost	
C1901 Marine Corps Ground Weaponry PIP	1421	6313	7661	5228	3373	2007	2063	Continuing	Continuing	
Quantity of RDT&E Articles										
<p><b>A. (U) <u>Mission Description and Budget Item Justification:</u></b></p> <p>(U) This Project develops joint and Marine Corps unique improvements to infantry weapons and artillery technology, USMC unique Amphibious Armor Systems (AAS), improvements for the M1A1 Main Battle Tank and support systems, and monitors national and international weapons developments.</p> <p><b>(U) FY 1997 Accomplishments:</b></p> <ul style="list-style-type: none"> <li>• (U) \$ 611 Infantry Mods: Continued joint participation and Marine Corps unique activities for evaluation of safety, lethality, and technology improvements for Marine Corps infantry/reconnaissance weapons and night vision devices. Pursued improvements in accuracy, reliability, and maintainability of the current service rifle, special operations weapons, and crew served weapons. Began development and testing for the Infra Red Laser Pointer (IRLP) and continued development and program documentation for the .50 caliber Heavy Machine Gun Upgrade and the .50 caliber blank firing adapter. Pursue improvements in accuracy, reliability, and maintainability of the current family of small arms, crew served weapons, and special operations weapons.</li> <li>• (U) \$ 601 Fire Support Mods: Continued joint participation for artillery and fire support improvements. Continued M198 Howitzer and Modular Universal Laser Equipment (MULE) sustainment, alternatives for Hydrogen Generators, Position Azimuth Determination System (PADS) replacement and field survey improvements, development of the Met Measuring System (MMS), and development of the AN/TPQ-36 Radar.</li> <li>• (U) \$ 125 Armor Mods: Continued joint evaluation of modifications of amphibious armor including Gen II Fire Control Systems, carbon dioxide fire control systems, Battlefield Combat Identification System (BCIS), and others.</li> <li>• (U) \$ 84 Small Craft: Fault analysis for future modifications to Marine Corps riverine assault craft.</li> </ul> <p>(U)Total \$ 1,421</p>										
Project C1901			Page 170 - 10 of 170 - 25 Pages				Exhibit R-2			

**UNCLASSIFIED**

<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)</b>		DATE <b>FEBRUARY 1998</b>
BUDGET ACTIVITY <b>7 - Operational System Development</b>	PE NUMBER AND TITLE <b>0206623M Marine Corps Ground Combat/Supporting Arms Systems</b>	PROJECT <b>C1901</b>
<b>(U) FY 1998 Planned Program:</b>		
• (U) \$	229 Armored Vehicle Driver's Thermal Viewers (AVDVE): Bracket development, operational testing and procurement documentation for the LAV/AAV procurement of the Armored Vehicle Driver's Thermal Viewers for all USMC vehicles.	
• (U) \$	211 Armor Mods: Continue joint evaluation of modifications of amphibious armor including Component Enhancements, Advanced Fire Control System, survivability systems, M88 and AVLB upgrades, and others.	
• (U) \$	1,967 Target Location Designator Hand-off System (TLDHS): Continue to participate in joint EMD development of the Army's Lightweight Laser Designator Rangefinder hardware and continue to define and develop a TLDHS software application. Continue risk mitigation efforts through analysis of emerging technologies and identify opportunities to technology insertion to meet USMC unique operational requirements. Continue to refine TLDHS software to ensure interoperability with tactical C4I architectures and weapons platforms.	
• (U) \$	688 Fire Support Mods: Continue joint participation for artillery and fire support improvements. Continued M198 Howitzer sustainment, Mortar Ballistic Computer (MBC), and alternatives for hydrogen generators, and continued joint participation pursuing system improvements/sustainments of MMS & PADS.	
• (U) \$	806 Infantry Mods: Continued joint participation and Marine Corps unique activities for evaluation of safety, lethality, and technology improvements for Marine Corps infantry/reconnaissance individual weapons, crew served weapons, and night vision devices. Pursue improvements in accuracy, reliability, and maintainability of the current service rifle, special operations weapons, and crew served weapons.	
• (U) \$	213 Thermal Weapons Sight (TWS): Continue joint participation and Marine Corps unique activities for development of the Thermal Weapons Sight Program (TWS).	
• (U) \$	50 Gun Laying Positioning System (GLPS): Initiate Marine Corps unique life cycle cost estimates and logistic support documentation.	
• (U) \$	90 Meteorological Hydrogen Generator (MHG): Initiate Marine Corps unique life cycle cost estimates and logistic support documentation.	
• (U) \$	1,901 AN/VVR-1 Laser Warning Receiver: Start assessment of Integration of this system into M1A1 Tanks as a potential candidate for a Laser Warning System & for interface with the service-chosen situational awareness candidate.	
• (U) \$	158 SBIR: Portion of program reserved for Small Business Innovation Research assessment in accordance with 15 U.S.C. 638 (f)(1).	
(U)Total \$	6,313	
<b>(U) FY 1999 Planned Program:</b>		
Project C1901	Page 170 - 12 of 170 - 25 Pages	Exhibit R-2

**UNCLASSIFIED**

<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)</b>		DATE <b>FEBRUARY 1998</b>
<b>BUDGET ACTIVITY</b> <b>7 - Operational System Development</b>	<b>PE NUMBER AND TITLE</b> <b>0206623M Marine Corps Ground Combat/Supporting Arms Systems</b>	<b>PROJECT</b> <b>C1901</b>
<ul style="list-style-type: none"> <li>• (U) \$ 236 Armored Vehicle Driver's Thermal Viewers (AVDVE): Integrated logistics documentation and testing for the LAV/AAV procurement of the Armored Vehicle Driver's Thermal Viewers for all USMC vehicles.</li> <li>• (U) \$ 253 Armor Mods: Continue joint evaluation of modifications of amphibious armor including Component Enhancements, Advanced Fire Control System, survivability systems, M88 and AVLB upgrades, BCIS, and others.</li> <li>• (U) \$ 3,791 Target Location Designator Hand-off System (TLDHS): Complete joint EMD development and conduct Operational Testing and Evaluation of hardware prototypes with the Army's LLDR program. Complete hardware and software integration efforts. Continue to refine, code and verify and validate TLDHS software application to ensure interoperability within the Marine Corps tactical C4I architecture and with other fire support systems, platforms and agencies.</li> <li>• (U) \$ 1,517 Fire Support Mods: Continue joint participation for artillery and fire support improvements. Continue joint participation in M198 Howitzer sustainment, PADS replacement, Mortar Ballistic Computer (MBC), Survey Information Center (SIC) shelters, and alternatives for hydrogen generators, and continued joint participation pursuing system improvements/sustainments of MMS &amp; PADS.</li> <li>• (U) \$ 1,141 Infantry Mods: Continued joint participation and Marine Corps unique activities for evaluation of safety, lethality, and technology improvements for Marine Corps infantry/reconnaissance individual and crew served weapons. Pursue solutions to integrate weapons systems with existing and planned night vision and sighting technologies including revisions of mounts and interfaces. Begin weapon system integration into the Integrated Infantry Combat System (IICS) to enhance the efficiency, effectiveness and safety of the Combat System.</li> <li>• (U) \$ 60 Gun Laying Positioning System (GLPS): Continue Marine Corps unique life cycle cost estimates and logistic support documentation.</li> <li>• (U) \$ 50 Meteorological Hydrogen Generator (MHG): Initiate Marine Corps unique life cycle cost estimates and logistic support documentation.</li> <li>• (U) \$ 613 Thermal Weapons Sight (TWS): Conduct operational testing and evaluation TWS.</li> </ul> <p>(U)Total \$ 7,661</p>		
<b>B. (U) <u>Project Change Summary</u></b>	<u>FY 1997</u>	<u>FY 1998</u>
	<u>FY 1999</u>	
(U) Previous President's Budget	1506	4568
(U) Adjustments to Previous President's Budget	-85	+1745
(U) Current Budget Submit	1421	6313
		7787
		-126
		7661
 (U) Change Summary Explanation:		
Project C1901	Page 170 - 13 of 170 - 25 Pages	Exhibit R-2

**UNCLASSIFIED**

<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)</b>							DATE <b>FEBRUARY 1998</b>				
<b>BUDGET ACTIVITY</b> <b>7 - Operational System Development</b>				<b>PE NUMBER AND TITLE</b> <b>0206623M Marine Corps Ground Combat/Supporting Arms Systems</b>				<b>PROJECT</b> <b>C1901</b>			
<p>(U) Funding: Decrease of \$85K in FY 1997 &amp; 126K in FY 1999 due to minor program changes and inflation adjustments. Increase of +1745K in FY 1998 due to addition of \$2.1M for AN/VVR-1 from Congressional adjustment combined with a decrease of 355K for general and CAAS reductions.</p> <p>(U) Schedule: Not applicable.</p> <p>(U) Technical: Not applicable.</p>											
<b>C. (U) <u>Other Program Funding Summary</u></b>			<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	To <u>Compl</u>	Total <u>Cost</u>
<b>(APPN, BLI #, NOMEN)</b>										<u>Cont.</u>	<u>Cont.</u>
(U) PMC (BLI#206300) Modifications Kits (Trk Veh)			319	4373	5726	20633	16231	18949	2007		
(U) PMC (BLI#220900) Modifications Kits (Arty & Other)			1663	1512	1809	1658	1392	1139	1173		
(U) PMC (BLI#493000) Near Infrared FAC Pointer (ILP)			0	2542	0	0	0	0	0	0	837
(U) PMC (BLI#473300) Mortar Ballistic Computer (MBD)			0	0	0	0	3066	3000	0	0	6066
(U) PMC (BLI#473300) Target Location Designation and Hand-off System (TLDHS)			0	0	0	4280	11697	18168	19117		
(U) PMC (BLI#493000) Thermal Wepaon Sight (TWS)			0	0	0	27096	27807	28568	24878		
(U) PMC (BLI#219700) Meteorological Hydrogen Generator			0	0	0	0	2986	0	0	0	Cont.
(U) PMC (BLI#219800) Gun Laying Positioning System (GLIPS)			0	0	0	0	12777	13293	0	0	Cont.
<b>(U) Related RDT&amp;E</b>											
(U) All Ground Weapons and Ground Ammunition Systems: Army, Navy, Air Force, Coast Guard, and Commander Special Operations Command.											
<b>D. (U) <u>Schedule Profile: See attached.</u></b>											
<b>GLPS</b>											
Project C1901			Page 170 - 14 of 170 - 25 Pages				Exhibit R-2				



**RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)**

DATE **FEBRUARY 1998**

BUDGET ACTIVITY  
**7 - Operational System Development**

PE NUMBER AND TITLE  
**0206623M Marine Corps Ground  
Combat/Supporting Arms Systems**

PROJECT  
**C1901**

ID	Task Name	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
		'93	'94	'95	'96	'97	'98	'99	'00	'01	'02
1	MNS	▲									
2	ACAT IV Designation		▲								
3	Milestone 0		◆								
4	RAA in Lieu of COEA		▬								
5	Joint MOA Approved		▬								
6	Approved ORD		▬				▲				
7	TFT/OT		▬								
8	Milestone I/III TC Generic					◆					
9	PQT/OT						▬				
10	MCPDM								▲		
11	FUE									▲	
12	IOC										▲
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											

TLDHS

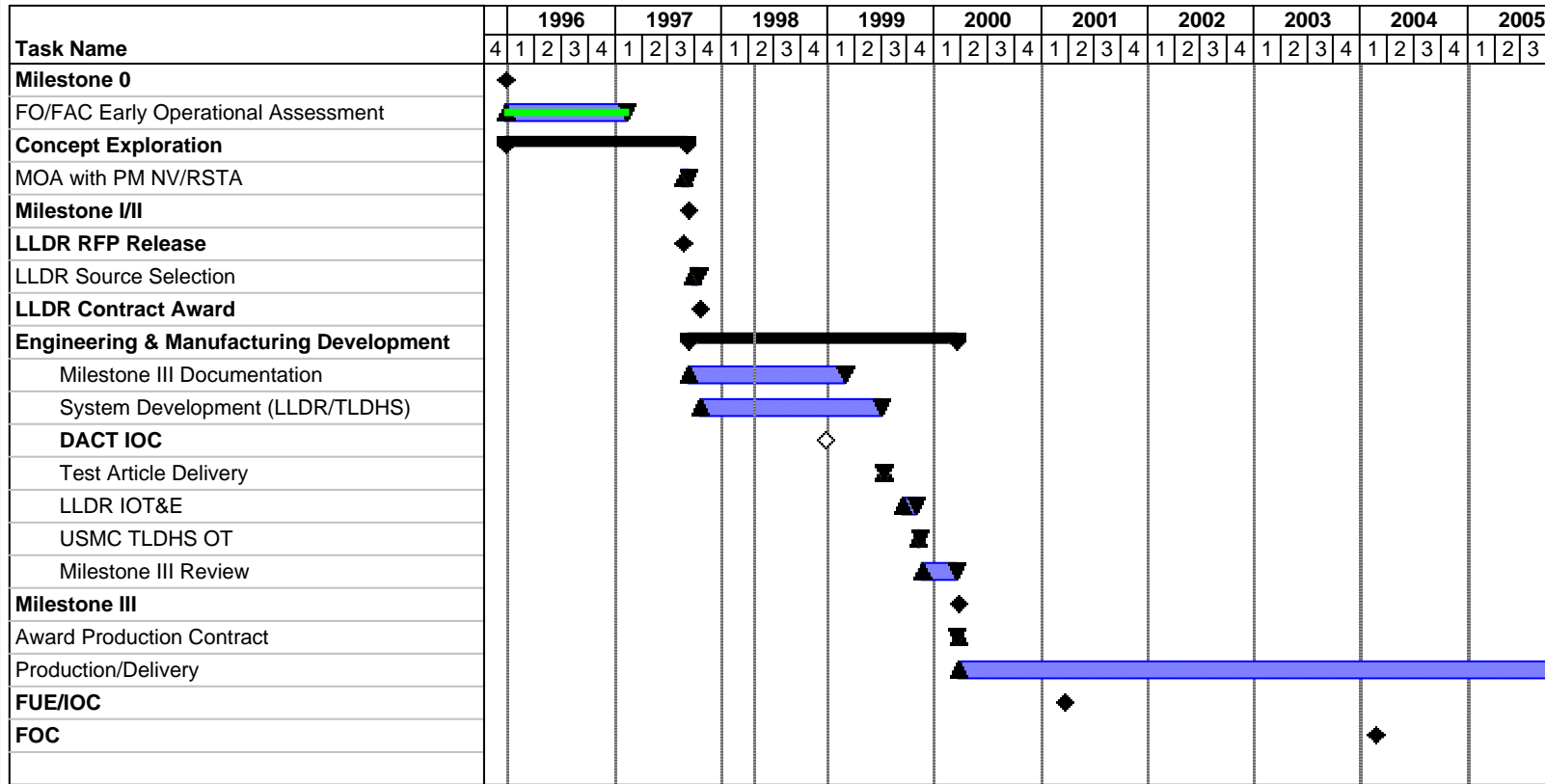
**RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)**

DATE **FEBRUARY 1998**

BUDGET ACTIVITY  
**7 - Operational System Development**

PE NUMBER AND TITLE  
**0206623M Marine Corps Ground  
Combat/Supporting Arms Systems**

PROJECT  
**C1901**



MHG

**RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 EXHIBIT)**

DATE **FEBRUARY 1998**

BUDGET ACTIVITY  
**7 - Operational System Development**

PE NUMBER AND TITLE  
**0206623M Marine Corps Ground  
Combat/Supporting Arms Systems**

PROJECT  
**C1901**

ID	Task Name	Duration	1995		1996		1997		1998		1999		2000		2001		2002		20
			Qtr 1	Qtr 3	Qtr 1	Qtr 3	Qtr 1	Qtr 3	Qtr 1	Qtr 3	Qtr 1	Qtr 3	Qtr 1	Qtr 3	Qtr 1	Qtr 3	Qtr 1	Qtr 3	Qtr 1
1	ORD	762d																	
2	Joint MOA	761d																	
3	MNS	1d	▲																
4	Milestone 0	80d																	
5	IOT&E	22d				▲													
6	RAA in Lieu of COEA	1d					▲												
7	MCPDM	0d											△ 1/1						
8	IOC	0d														△ 7/15			
9	FOC	1d																△	
10																			
11																			
12																			
13																			
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16																			
17																			
18																			
19																			
20																			
21																			
22																			
23																			

AVDVE

**RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)**

DATE **FEBRUARY 1998**

BUDGET ACTIVITY  
**7 - Operational System Development**

PE NUMBER AND TITLE  
**0206623M Marine Corps Ground  
Combat/Supporting Arms Systems**

PROJECT  
**C1901**

ID	Task Name	Duration	6		1997				1998				1999				2000				2001			
			Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	
1	MS 0 APPROVAL/ACAT III	0d																						
2	ENGINEERING DEVELOPME	260d																						
3	DT II	86d	■																					
4	USMC ORD APPROVAL	0d		4/15																				
5	US ARMY LIMITED PRODUC	261d			■	■	■	■																
6	USMC UNIQUE OT	206d				■	■	■	■															
7	MS III (JOINT)	0d						◆ 4/10																
8	RFP RELEASED	0d								◆ 1/16														
9	CONTRACT AWARD	0d										◆ 5/1												
10	PRODUCTION START	0d											◆ 7/1											
11	USMC MCPDM	0d												◆ 8/17										
12	IPT/FAT/USER TEST	107d												■	■									
13	DELI VERY TO USMC	892d													■	■	■	■	■	■	■	■	■	■
14	IOC	0d																			◆ 9/30			
15	FOC	0d																						
16																								
17																								
18																								
19																								
20																								
21																								
22																								

**UNCLASSIFIED**

<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)</b>							DATE <b>FEBRUARY 1998</b>			
BUDGET ACTIVITY <b>7 - Operational System Development</b>				PE NUMBER AND TITLE <b>0206623M Marine Corps Ground Combat/Supporting Arms Systems</b>				PROJECT <b>C2086</b>		
<i>COST (In Thousands)</i>	FY 1997 Actual	FY 1998 Estimate	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	Cost to Complete	Total Cost	
C2086 Marine Enhancement Program	1766	2399	3174	3483	3589	3287	2961	Continuing	Continuing	
Quantity of RDT&E Articles										
<p><b>A. (U) <u>Mission Description and Budget Item Justification:</u></b></p> <p>(U) This program was formerly titled Soldier/Marine Enhancement. MEP provides Research, Development, Test and Evaluation funding for low visibility, low cost items. It focuses on items of equipment which will benefit the individual Marine by reducing the load, increasing survivability, enhancing safety and improving combat effectiveness. The emphasis of the program is on non-developmental/commercially available items which can be quickly evaluated and fielded. This program is coordinated with the Army's Soldier Enhancement Program and the Special Operations Command.</p> <p><b>(U) FY 1997 Accomplishments:</b></p> <ul style="list-style-type: none"> <li>• (U) \$ 575 Explored NDI equipment that will improve the combat effectiveness and enhance safety and survivability of the Individual Marine.</li> <li>• (U) \$ 975 Explore clothing and individual equipment NDI categories.</li> <li>• (U) \$ 216 Explored ground weapons, communications and command and control equipment NDI categories.</li> </ul> <p>(U)Total \$ 1,766</p> <p><b>(U) FY 1998 Planned Program:</b></p> <ul style="list-style-type: none"> <li>• (U) \$ 546 Continue to explore NDI equipment that will improve the combat effectiveness and enhance safety and survivability of the Individual Marine.</li> <li>• (U) \$ 480 Continue to explore clothing and individual equipment NDI categories.</li> <li>• (U) \$ 446 Continue to explore ground weapons, communications and command and control equipment NDI categories.</li> <li>• (U) \$ 884 Explore initial issue clothing and individual equipment categories.</li> <li>• (U) \$ 43 SBIR: Portion of program reserved for Small Business Innovation Research assessment in accordance with 15 U.S.C. 638 (f)(1).</li> </ul> <p>(U)Total \$ 2,399</p> <p><b>(U) FY 1999 Planned Program:</b></p>										
Project C2086			<i>Page 170 - 19 of 170 - 25 Pages</i>				Exhibit R-2			

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<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)</b>		DATE <b>FEBRUARY 1998</b>							
<b>BUDGET ACTIVITY</b> <b>7 - Operational System Development</b>	<b>PE NUMBER AND TITLE</b> <b>0206623M Marine Corps Ground Combat/Supporting Arms Systems</b>	<b>PROJECT</b> <b>C2086</b>							
<ul style="list-style-type: none"> <li>• (U) \$ 543 Continue to explore NDI equipment that will improve the combat effectiveness and enhance safety and survivability of the Individual Marine.</li> <li>• (U) \$ 553 Continue to explore clothing and individual equipment NDI categories.</li> <li>• (U) \$ 544 Continue to explore ground weapons, communications and command and control equipment NDI categories.</li> <li>• (U) \$ 1534 Explore initial issue clothing and individual equipment categories.</li> </ul> <p>(U)Total \$ 3,174</p>									
<b>B. (U) <u>Project Change Summary</u></b>									
	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>						
(U) Previous President's Budget	1813	2594	2119						
(U) Adjustments to Previous President's Budget	-32	0	1108						
(U) Current Budget Submit	1781	2594	3227						
(U) Change Summary Explanation:									
(U) Funding: FY 1997 decrease of \$32k is due to minor affordability changes. FY 1999 increase of \$1,108k is due to an internal realignment within this PE.									
(U) Schedule: N/A									
(U) Technical: N/A									
<b>C. (U) <u>Other Program Funding Summary</u></b>									
	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>To</u>	<u>Total</u>
								<u>Compl</u>	<u>Cost</u>
(U) PMC (BLI 3221100) MEP	3047	1513	2114	1832	6775	1597	1761	Cont.	Cont.
(U) O&M Initial Issue	42606	24959	25659	26376	27114	27872	28655	Cont.	Cont.
(U) <b>Related RDT&amp;E:</b> PE 0604713A (Combat Feeding, Clothing and Equipment)									
<b>D. (U) <u>Schedule Profile:</u> N/A</b>									
Project C2086			Page 170 - 20 of 170 - 25 Pages				Exhibit R-2		

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<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)</b>							DATE <b>FEBRUARY 1998</b>			
BUDGET ACTIVITY <b>7 - Operational System Development</b>				PE NUMBER AND TITLE <b>0206623M Marine Corps Ground Combat/Supporting Arms Systems</b>				PROJECT <b>C2237</b>		
COST <i>(In Thousands)</i>	FY 1997 Actual	FY 1998 Estimate	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	Cost to Complete	Total Cost	
C2237 Amphibious Vehicle Test Branch	1650	1596	1965	2015	2069	2118	2176	Continuing	Continuing	
Quantity of RDT&E Articles										
<p><b>A. (U) <u>Mission Description and Budget Item Justification:</u></b></p> <p>(U) This project was formerly titled Advanced Amphibious Test Directorate (AVTD). The AVTB is a one-of-a-kind Department of Defense Test Facility for amphibious vehicles and supports the requirements of all services. The AVTB conducts developmental, combined developmental/operational, and follow-on testing and evaluation of production hardware. It also conducts Product Assurance Testing and substitute or alternative parts and material testing for amphibious vehicles and associated equipment. Because of its year-round temperate climate, diverse terrain, and 17 miles of coastline, the AVTB is ideal for amphibious vehicle, as well as ship related testing. The AVTB is in close proximity to San Clemente island which is used frequently for live fire sea-to-shore testing and high-speed water testing. The AVTB is committed to testing product improvement programs, engineering change proposal design changes, and field change requests.</p> <p><b>U) FY 1997 Accomplishments:</b></p> <ul style="list-style-type: none"> <li>• (U) \$ 357 Program support, supplies, and services at AVTB test site to support scheduled Amphibious Assault Vehicle 7A1 (AAV7A1) and Advanced Amphibious Assault Vehicle (AAAV) Developmental Testing. These funds provided organic supply support including management operations, general accounting, and a maintenance float of equipment. Provided intermediate maintenance (third echelon) of organic non-developmental communication electronic and ordnance equipment.</li> <li>• (U) \$ 200 Provided funding for necessary services provided by Marine Corps Base, Camp Pendleton (MCB CAMPEN), California and off-station units for electricity, heating and other power charges; long distance telephone support; and calibration of laboratory test equipment and maintenance equipment.</li> </ul>										
Project C2237			Page 170 - 21 of 170 - 25 Pages				Exhibit R-2			

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<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)</b>		DATE <b>FEBRUARY 1998</b>
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
<b>7 - Operational System Development</b>	<b>0206623M Marine Corps Ground Combat/Supporting Arms Systems</b>	<b>C2237</b>
<ul style="list-style-type: none"> <li>(U) \$ 1093 Provided AVTB personnel civilian salaries to support scheduled AAV7A1 and AAV Developmental Testing. Planned and conducted Developmental Tests and report results, identifying any unresolved test issues in accordance with approved test plans and procedures. Prepared analysis of field-reported problems as received. Provided recommendations pertaining to design requirements which affected both operational effectiveness and operation suitability. Performed all echelons of maintenance on developmental items, including all on-hand assets of assault amphibious vehicles, within the capabilities of on-hand personnel, tools, test, and measuring equipment and facilities. Provided technical assistance and recommendations in the test of substitute or alternate parts and materials. Prepared analysis of proposed engineering changes. Conducted hardware testing and evaluation of design changes, including verification of both the design and the technical data in accordance with approved test plans and procedures. Provided technical assistance in writing and revision of Technical Manuals. Provide technical reviews and recommendations regarding proposed Modification, Technical, Retrofit Instructions, and Retrofit Kit Hardware. Provided Testing expertise to Program Managers to assist in program acquisition strategy development. Provided Technical reviews and recommendation on Test and Evaluation Master Plans (TEMP's) and Detailed Test Plans for Program Managers. Provided technical input as the Marine Corps Developmental Testing representative to the Department of Defense Common Test and Training Range Architecture workshops.</li> </ul>		
(U)Total \$ 1650		
<b>(U) FY 1998 Planned Program:</b>		
<ul style="list-style-type: none"> <li>(U) \$ 294 Program support, supplies, and services at AVTB test site to support scheduled Amphibious Assault Vehicle 7A1 (AAV7A1) "rebuild to standard" testing, Advanced Amphibious Assault Vehicle (AAAV) Developmental Testing as well as other Marine Corps mobility and mine warfare programs. Provide on-site support, supplies, and services to support Naval Sea Systems Command and Naval Mine Warfare Command for developmental testing of Navy mine countermeasures systems. Provide services and support to the Department of Defense Common Test and Training Range Architecture workshops. These funds provide organic supply support including management operations, general accounting, and a maintenance float of equipment. Provide intermediate maintenance (third echelon) of organic non-developmental communication electronic and ordnance equipment.</li> <li>(U) \$ 99 Provide funding for necessary services provided by Marine Corps Base, Camp Pendleton (MCB CAMPEN), California and off-station units for electricity, heating and other power charges; long distance telephone support; and calibration of laboratory test equipment and maintenance equipment.</li> </ul>		
Project C2237	Page 170 - 22 of 170 - 25 Pages	Exhibit R-2



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<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)</b>		DATE <b>FEBRUARY 1998</b>
BUDGET ACTIVITY <b>7 - Operational System Development</b>	PE NUMBER AND TITLE <b>0206623M Marine Corps Ground Combat/Supporting Arms Systems</b>	
PROJECT <b>C2237</b>		
<ul style="list-style-type: none"> <li>• (U) \$ 1202</li> </ul>	<p>Provide AVTB personnel civilian salaries to support scheduled AAV7A1 and AAV Developmental Testing. Plan and conduct Developmental Tests and report results, identifying any unresolved test issues in accordance with approved test plans and procedures. Prepare analysis of field-reported problems as received. Provide recommendations pertaining to design requirements which affect both operational effectiveness and operation suitability. Perform all echelons of maintenance on developmental items, including all on-hand assets of assault amphibious vehicles, within the capabilities of on-hand personnel, tools, test, and measuring equipment and facilities. Provide technical assistance and recommendations in the test of substitute or alternate parts and materials. Prepare technical analysis of proposed product improvements as requested. Prepare analysis of proposed engineering changes. Conduct hardware testing and evaluation of design changes, including verification of both the design and the technical data in accordance with approved test plans and procedures. Provide technical assistance in writing and revision of Technical Manuals. Provide technical reviews and recommendations regarding proposed Modification, Technical, Retrofit Instructions, and Retrofit Kit Hardware. Provide Testing expertise to Program Managers to assist in program acquisition strategy development. Provide Technical reviews and recommendation on Test and Evaluation Master Plans (TEMP's) and Detailed Test Plans for Program Managers. Provide technical input as the Marine Corps Developmental Testing representative to the Department of Defense Common Test and Training Range Architecture workshops.</p>	
<ul style="list-style-type: none"> <li>• (U) \$ 1</li> </ul>	<p>SBIR: Portion of Program reserved for Small Business Innovation Research assessment in accordance with 15 U.S.C. 638 (f) (1).</p>	
<p>(U)Total \$ 1596</p>		
<b>(U) FY 1999 Planned Program:</b>		
<ul style="list-style-type: none"> <li>• (U) \$ 508</li> </ul>	<p>Program support, supplies, and services at AVTB test site to support scheduled Amphibious Assault Vehicle 7A1 (AAV7A1) "rebuild to standard" testing, Advanced Amphibious Assault Vehicle (AAAV) Developmental Testing as well as other Marine Corps mobility and mine warfare programs. Provide on-site support, supplies, and services to support Naval Sea Systems command and Naval Mine Warfare Command for developmental testing of Navy mine countermeasures systems. Provide services and support to the Department of Defense Common Test and Training range Architecture workshops. These funds provide organic supply support including management operations, general accounting, and a maintenance float of equipment. Provide intermediate maintenance (third echelon) of organic non-developmental communication electronic and ordnance equipment.</p>	
<ul style="list-style-type: none"> <li>• (U) \$ 291</li> </ul>	<p>Provide funding for necessary services provided by Marine Corps Base, Camp Pendleton (MCB CAMPEN), California and off-station units for electricity, heating and other power charges; long distance telephone support; and calibration of laboratory test equipment and maintenance equipment.</p>	

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<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)</b>		DATE <b>FEBRUARY 1998</b>							
<b>BUDGET ACTIVITY</b> <b>7 - Operational System Development</b>	<b>PE NUMBER AND TITLE</b> <b>0206623M Marine Corps Ground Combat/Supporting Arms Systems</b>	<b>PROJECT</b> <b>C2237</b>							
<ul style="list-style-type: none"> <li>• (U) \$ 1166 Provide AVTB personnel civilian salaries to support scheduled AAV7A1 and AAV Developmental Testing. Plan and conduct Developmental Tests and report results, identifying any unresolved test issues in accordance with approved test plans and procedures. Prepare analysis of field-reported problems as received. Provide recommendations pertaining to design requirements which affect both operational effectiveness and operation suitability. Perform all echelons of maintenance on developmental items, including all on-hand assets of assault amphibious vehicles, within the capabilities of on-hand personnel, tools, test, and measuring equipment and facilities. Provide technical assistance and recommendations in the test of substitute or alternate parts and materials. Prepare technical analysis of proposed product improvements as requested. Prepare analysis of proposed engineering changes. Conduct hardware testing and evaluation of design changes, including verification of both the design and the technical data in accordance with approved test plans and procedures. Provide technical assistance in writing and revision of Technical Manuals. Provide technical reviews and recommendations regarding proposed Modification, Technical, Retrofit Instructions, and Retrofit Kit Hardware. Provide Testing expertise to Program Managers to assist in program acquisition strategy development. Provide Technical reviews and recommendation on Test and Evaluation Master Plans (TEMP'S) and Detailed Test Plans for Program Managers. Provide technical input as the Marine Corps Developmental Testing representative to the Department of Defense Common Test and Training Range Architecture workshops.</li> </ul>									
(U)Total \$ 1965									
<b>B. (U) <u>Project Change Summary</u></b>									
	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>						
(U) Previous President's Budget	1648	1944	1992						
(U) Adjustments to Previous President's Budget	2	-348	-27						
(U) Current Budget Submit	1650	1596	1965						
(U) Change Summary Explanation:									
(U) Funding: FY 1997 increase of \$2K reflects minor program changes. FY 1998 internal budget adjustment finances higher priority Marine Corps program and general CAAS Reduction. FY 1999 decrease reflects inflation adjustment.									
(U) Schedule: N/A									
(U) Technical: N/A									
<b>C. (U) <u>Other Program Funding Summary</u></b>									
<b>(APPN, BLI #, NOMEN)</b>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	To	Total
								<u>Compl</u>	<u>Cost</u>
(U) Not Applicable									
Project C2237			Page 170 - 24 of 170 - 25 Pages				Exhibit R-2		

DATE  
**FEBRUARY 1998**

BUDGET ACTIVITY  
**7 - Operational System Development**

PE NUMBER AND TITLE  
**0206623M Marine Corps Ground  
Combat/Supporting Arms Systems**

(U) **Related RDT&E: PE 0603611M (Marine Corps Assault Vehicles)**

**D. (U) Schedule Profile**

Testing conducted at AVTB includes all aspects of Marine Corps Amphibious Assault Vehicles. Testing planned for FY 97 and beyond includes MK 154 Minefield Breaching System, M36E3 weapons sight, IRAM (Improved Reliability and Maintainability) Transmission, Engineering Change Proposals (ECP) as required, Combined Recoil Booster (CRB) for adoption of MILES system for AAV use, and the Bradley Fighting Vehicle suspension and engine test for the AAVP7A1 retrofit. AVTB will also support the testing of the Advanced Amphibian Assault Vehicle (DRPM AAA) as directed, by PM AAA, during the Demonstration & Validation phase of the AAA Program Development.

**UNCLASSIFIED**

<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)</b>							DATE <b>February 1998</b>		
<b>BUDGET ACTIVITY</b> <b>7 - Operational System Development</b>				<b>PE NUMBER AND TITLE</b> <b>0206624M Marine Corps Combat Services Support</b>					
<i>COST (In Thousands)</i>	FY 1997 Actual	FY 1998 Estimate	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	7993	4857	4634	10996	7673	7995	1127	Continuing	Continuing
C0076 Medium Tactical Vehicle Replacement (MTVR)	6384	3836	1968	8379	1322	1349	0	0	31817
C0200 Light Tactical Vehicle Replacement (LTVR)	530	185	0	0	0	0	0	0	715
C0201 Logistical Vehicle System Replacement (LVSF)	0	0	910	1031	5517	6507	979	0	14944
C2316 Combat Service Support Engineering Equipment	1079	836	1756	1586	834	139	148	Continuing	Continuing
Quantity of RDT&E Articles									
<p><b>(U) <u>Mission Description and Budget Item Justification:</u></b> This program element (PE) provides funding for Marine Air-Ground Task Force requirements for Combat Service Support equipment improvements. It will enhance combat breaching capabilities of the ground combat elements, provide potable water from any available raw water source, reduce support personnel, logistics, maintenance and transportation requirements. It will also determine the reconfiguration of the current Twin Agent Unit firefighting apparatus and provide a portable, highly mobile general purpose automatic tester designed for use by technicians in the garrison and at the forward edge of the battlefield. The PE also provides improvements in all areas of Combat Service Support Equipment Vehicles by determining the replacement for the heavy, medium and light fleet vehicles.</p> <p><b>(U) <u>Justification for Budget Activity:</u></b> This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it encompasses engineering and manufacturing development for upgrade of existing, operational systems.</p>									
<i>Page 171 - 1 of 171 - 19 Pages</i>							Exhibit R-2		

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)							DATE February 1998		
BUDGET ACTIVITY <b>7 - Operational System Development</b>				PE NUMBER AND TITLE <b>0206624M Marine Corps Combat Services Support</b>				PROJECT <b>C0076</b>	
COST (In Thousands)	FY 1997 Actual	FY 1998 Estimate	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	Cost to Complete	Total Cost
C0076 Medium Tactical Vehicle Replacement (MTVR)	6384	3836	1968	8379	1322	1349	0	0	31817
Quantity of RDT&E Articles	10			8					
<p><b>A. (U) Mission Description and Budget Item Justification:</b> The Medium Tactical Vehicle Replacement (MTVR) Program will determine the replacement vehicle for the Medium 5-ton fleet. This project will increase mobility, maintainability, and reliability for the medium fleet.</p> <p><b>(U) FY 1997 Accomplishments:</b></p> <ul style="list-style-type: none"> <li>• (U) \$ 5399 Award EMD contracts for prototype truck fabrications and initiate Developmental Testing (DT) on 10 EMD vehicles.</li> <li>• (U) \$ 802 Provide program documentation and management support of the MTVR program.</li> <li>• (U) \$ 79 Continue to provide travel in support of the MTVR program.</li> <li>• (U) \$ 54 Testing with the Marine Corps advanced technology transition demonstrator.</li> <li>• (U) \$ 50 Initiated corrosion engineering efforts for MTVR.</li> </ul> <p>(U)Total \$ 6,384</p> <p><b>(U) FY 1998 Planned Program:</b></p> <ul style="list-style-type: none"> <li>• (U) \$ 2336 Continue testing prototype vehicles provided by contractors. Durability testing, Reliability, Availability and Maintainability (RAM) testing, etc.</li> <li>• (U) \$ 1130 Provide program documentation and management support for the MTVR program.</li> <li>• (U) \$ 120 Provide travel in support of the MTVR program.</li> <li>• (U) \$ 145 Provide for Source Selection Evaluation Board.</li> <li>• (U) \$ 105 SBIR: Portion of program reserved for Small Business Innovation Research assessment in accordance with 15 U.S.C. 638 (f)(1).</li> </ul> <p>(U)Total \$ 3,836</p> <p><b>(U) FY 1999 Planned Program:</b></p> <ul style="list-style-type: none"> <li>• (U) \$ 1,968 Down select to one contractor via formal source selection procedures. Award LRIP quantities for all required follow-on operational testing.</li> </ul> <p>(U)Total \$ 1,968</p>									
Project C0076			Page 171 - 2 of 171 - 19 Pages				Exhibit R-2		

UNCLASSIFIED

<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)</b>	DATE <b>February 1998</b>
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BUDGET ACTIVITY <b>7 - Operational System Development</b>	PE NUMBER AND TITLE <b>0206624M Marine Corps Combat Services Support</b>	PROJECT <b>C0076</b>
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**B. (U) Project Change Summary**

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) Previous President's Budget	4468	3,986	1,814
(U) Adjustments to Previous President's Budget	+1916	-150	+154
(U) Current Budget Submit	6384	3,836	1,968

(U) Change Summary Explanation:

(U) Funding: FY 1997 funding increase of \$1,922 million is due to MTVR prototype hardware costing more than expected and \$6 thousand decreased to show economic adjustments. FY98 decrease of \$150 thousand reflects a minor affordability adjustment. FY 1999 decrease of \$18 thousand reflects a NWCF Surcharge reduction, an increase of \$207 thousand is due to refined cost estimates and a decrease of \$35 thousand is due to a minor affordability adjustment.

(U) Schedule: N/A

(U) Technical: N/A

**C. (U) Other Program Funding Summary**  
**(APPN, BLI #, NOMEN)**

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>To</u>	<u>Total</u>
								<u>Compl</u>	<u>Cost</u>
(U) PMC Line (BLI# 508800) MTVR	0	0	83717	127635	301495	310077	383631	CONT.	CONT.

**(U) Related RDT&E**

- (U) PE 0206623M Marine Corps Ground Combat Supporting Arms Systems
- (U) PE 0603640M Marine Corps Advanced Technology Demonstration
- (U) PE 0604804A Logistics and Engineering Equip/Engr Development
- (U) PE 0206313M Marine Corps Communications

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)

DATE February 1998

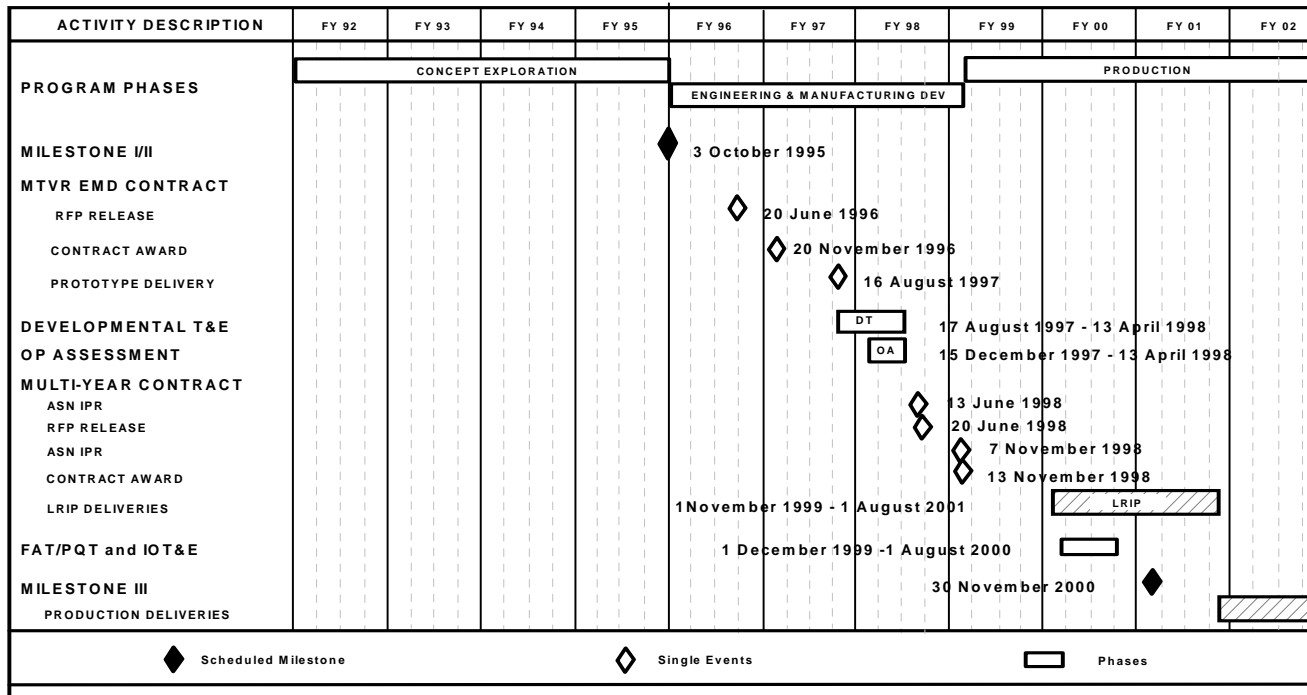
BUDGET ACTIVITY  
7 - Operational System Development

PE NUMBER AND TITLE  
0206624M Marine Corps Combat Services Support

PROJECT  
C0076

D. (U) Schedule Profile:

MEDIUM TACTICAL VEHICLE REPLACEMENT SCHEDULE



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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)							DATE February 1998				
BUDGET ACTIVITY <b>7 - Operational System Development</b>				PE NUMBER AND TITLE <b>0206624M Marine Corps Combat Services Support</b>				PROJECT <b>C0076</b>			
<b>A. (U) Project Cost Breakdown</b>				<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>					
Product Development				5399	0	1672					
Support and Management				931	1500	296					
Test and Evaluation				54	2336	0					
Total				6384	3836	1968					
<b>B. Budget Acquisition History and Planning Information</b>											
<b>Performing Organizations</b>											
Contractor or Government		Contract									
Performing Activity		Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1997	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	Budget to Complete	Total Program
<b>Product Development Organizations</b>											
TACOM		MIPR				5179	5399	0	1672	6463	18713
<b>Support and Management Organizations</b>											
TACOM		MIPR				1268	802	950	200	0	3220
MKI		RCP				72	0	325	0	500	897
SBIR		VARIOUS				0	0	105	0	0	105
MARCORSYSCOM		WR				60	129	120	96	200	605
<b>Test and Evaluation Organizations</b>											
TACOM		MIPR				2000	54	2336	0	4138	8528
<b>Government Furnished Property</b>											
Contract											
Method/Type or Funding Vehicle		Award or Obligation Date	Delivery Date			Total Prior to FY 1997	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	Budget to Complete	Total Program
<b>Product Development Property</b>											
N/A											
<b>Support and Management Property</b>											
N/A											
<b>Test and Evaluation Property</b>											
N/A											
Project C0076				Page 171 - 5 of 171 - 19 Pages				Exhibit R-2			



<b>RDT&amp;E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)</b>	DATE <b>February 1998</b>
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<b>BUDGET ACTIVITY</b> <b>7 - Operational System Development</b>	<b>PE NUMBER AND TITLE</b> <b>0206624M Marine Corps Combat Services Support</b>	<b>PROJECT</b> <b>C0076</b>
---	--	--------------------------------

	Total Prior to				Budget to	Total
	<u>FY 1997</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>Complete</u>	<u>Program</u>
Subtotal Product Development	5179	5399	0	1672	6463	18713
Subtotal Support and Management	1400	931	1500	296	700	4827
Subtotal Test and Evaluation	2000	54	2336	0	4138	8528
<b>Total Project</b>	<b>8579</b>	<b>6384</b>	<b>3836</b>	<b>1968</b>	<b>11301</b>	<b>32068</b>

C. Funding Profile. Not Applicable

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)							DATE <b>February 1998</b>		
BUDGET ACTIVITY <b>7 - Operational System Development</b>				PE NUMBER AND TITLE <b>0206624M Marine Corps Combat Services Support</b>				PROJECT <b>C0200</b>	
COST (In Thousands)	FY 1997 Actual	FY 1998 Estimate	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	Cost to Complete	Total Cost
C0200 Light Tactical Vehicle Replacement (LTVR)	530	185	0	0	0	0	0	0	715
Quantity of RDT&E Articles									
<p><b>A. (U) Mission Description and Budget Item Justification:</b> The Light Tactical Vehicle Replacement (LTVR) will determine the replacement vehicle for the Light Fleet. This project also includes improvements in all areas of motor transportation which will increase mobility, maintainability, and reliability.</p> <p><b>(U) FY 1997 Accomplishments:</b></p> <ul style="list-style-type: none"> <li>• (U) \$ 530 LTVR: Continue engineering research and exploration of component improvements. Provide for Army TACOM program support activities. Begin preparation of Milestone I/III documentation including ILSP, IPS, APBA and TEMP.</li> </ul> <p>(U)Total \$ 530</p> <p><b>(U) FY 1998 Planned Program:</b></p> <ul style="list-style-type: none"> <li>• (U) \$ 185 Provide for Army TACOM program support activities. Perform corrosion and component reliability testing. Complete Milestone I/III documentation.</li> </ul> <p>(U)Total \$ 185</p> <p><b>(U) FY 1999 Planned Program:</b></p> <ul style="list-style-type: none"> <li>• (U) \$ 0 N/A</li> </ul> <p>(U)Total \$ 0</p>									
Project C0200			Page 171 - 7 of 171 - 19 Pages				Exhibit R-2		

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)							DATE				
							February 1998				
BUDGET ACTIVITY			PE NUMBER AND TITLE				PROJECT				
<b>7 - Operational System Development</b>			<b>0206624M Marine Corps Combat Services Support</b>				<b>C0200</b>				
<b>B. (U) Project Change Summary</b>			<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>						
(U) Previous President's Budget			744	200	200						
(U) Adjustments to Previous President's Budget			-214	-15	-207						
(U) Current Budget Submit			530	185	0						
 (U) Change Summary Explanation:											
(U) Funding: FY 1997 change due to realignment of Marine Corps Combat Service programs and updated program cost estimates. The decrease of \$15 thousand in FY98 is due to a minor affordability adjustment.											
FY 1999 reflects a NWCF surcharge increase of \$7 thousand and a decrease of \$207 thousand due to FY 1998 Congressional direction and \$30 million Procurement, Marine Corps (PMC) funding to proceed with LTVR re-procurement. (U) Schedule: N/A											
 (U) Technical: N/A											
<b>C. (U) Other Program Funding Summary</b>			<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	To	Total
<b>(APPN, BLI #, NOMEN)</b>										<u>Compl</u>	<u>Cost</u>
(U) PMC Line (BLI #508900) LTVR			0	29319	39263	67754	63806	72750	68427	CONT.	CONT.
 <b>(U) Related RDT&amp;E</b>											
(U) PE 0206623M Marine Corps Ground Combat Supporting Arms Systems											
 <b>D. (U) Schedule Profile:</b>											

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)

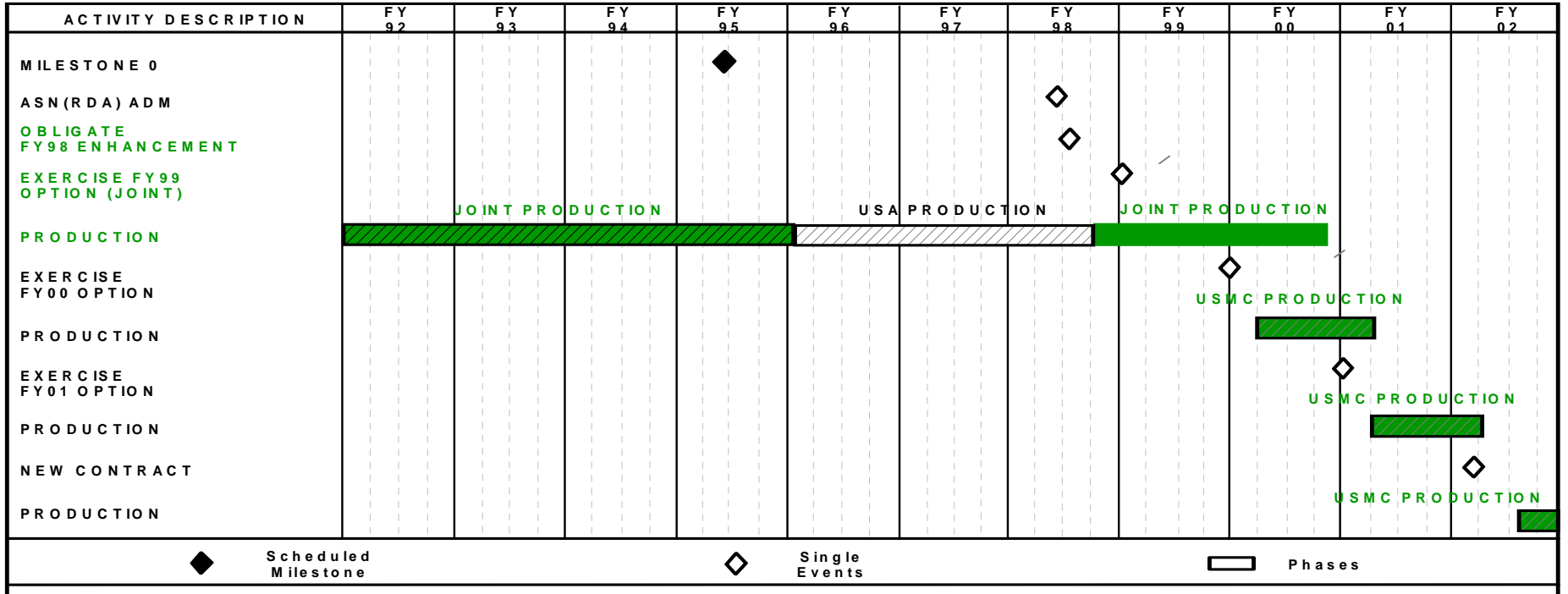
DATE February 1998

BUDGET ACTIVITY  
7 - Operational System Development

PE NUMBER AND TITLE  
0206624M Marine Corps Combat Services Support

PROJECT  
C0200

LTVR SCHEDULE



February 1998

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 1998			
BUDGET ACTIVITY <b>7 - Operational System Development</b>					PE NUMBER AND TITLE <b>0206624M Marine Corps Combat Services Support</b>				PROJECT <b>C0200</b>	
<b>A. (U) Project Cost Breakdown</b>					<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>			
Support and Management					530	185	0			
Total					530	185	0			
<b>B. Budget Acquisition History and Planning Information</b>										
<b>Performing Organizations</b>										
Contractor or Government	Contract Method/Type	Award or Obligation	Performing Activity	Project Office	Total Prior to				Budget to Complete	Total Program
Performing Activity	Vehicle	Date	EAC	EAC	FY 1997	FY 1997	FY 1998	FY 1999		
<b>Product Development Organizations</b>										
N/A					0	0	0	0	0	0
<b>Support and Management Organizations</b>										
Miscellaneous	MIPR/RCP	Various			0	70	0	0	0	70
TACOM	WR				0	120	125	0	0	245
MKI	RCP				0	340	60	0	0	400
<b>Test and Evaluation Organizations</b>										
					0	0	0	0	0	0
<b>Government Furnished Property</b>										
Item Description	Contract Method/Type	Award or Obligation	Delivery Date		Total Prior to				Budget to Complete	Total Program
	Vehicle	Date	Date		FY 1997	FY 1997	FY 1998	FY 1999		
<b>Product Development Property</b>										
N/A										
<b>Support and Management Property</b>										
N/A										
<b>Test and Evaluation Property</b>										
N/A										
Project C0200					Page 171 - 10 of 171 - 19 Pages				Exhibit R-3	

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)					DATE February 1998	
BUDGET ACTIVITY		PE NUMBER AND TITLE			PROJECT	
<b>7 - Operational System Development</b>		<b>0206624M Marine Corps Combat Services Support</b>			<b>C0200</b>	
	Total Prior to <u>FY 1997</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	Budget to Complete	Total Program
Subtotal Product Development						
Subtotal Support and Management	0	530	185	0	0	715
Subtotal Test and Evaluation						
Total Project	0	530	185	0	0	715

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<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)</b>	DATE <b>February 1998</b>
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BUDGET ACTIVITY <b>7 - Operational System Development</b>	PE NUMBER AND TITLE <b>0206624M Marine Corps Combat Services Support</b>	PROJECT <b>C0201</b>
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COST (In Thousands)	FY 1997 Actual	FY 1998 Estimate	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	Cost to Complete	Total Cost
C0201 Logistical Vehicle System Replacement (LVSR)	0	0	910	1031	5517	6507	979	0	14944
Quantity of RDT&E Articles									

**A. (U) Mission Description and Budget Item Justification:** The Logistical Vehicle System Replacement(LVSR)Program will determine the replacement vehicle for the Tactical Wheeled Vehicle Heavy Fleet. This project includes potential improvements mobility, reliability and maintainability, Durability (RAM-D), capability and supportability.

**(U) FY 1997 Accomplishments:**

- (U) \$ 0 N/A
- (U)Total \$ 0

**(U) FY 1998 Planned Program:**

- (U) \$ 0 N/A
- (U)Total \$ 0

**(U) FY 1999 Planned Program:**

- (U) \$ 910 Provide for Army TACOM program support activities, Initiate engineering research and explore component improvements in support of the LVSR program, including Milestone I/II documentation.
- (U)Total \$ 910

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<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)</b>							DATE <b>February 1998</b>			
<b>BUDGET ACTIVITY</b> <b>7 - Operational System Development</b>				<b>PE NUMBER AND TITLE</b> <b>0206624M Marine Corps Combat Services Support</b>			<b>PROJECT</b> <b>C0201</b>			
<b>B. (U) <u>Project Change Summary</u></b>				<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>				
(U) Previous President's Budget				0	0	923				
(U) Adjustments to Previous President's Budget				0	0	-13				
(U) Current Budget Submit				0	0	910				
 (U) Change Summary Explanation:										
(U) Funding: FY 1999 funds in the amount of \$3 thousand reflect a NWCF surcharge increase and the \$16 thousand decrease reflects a minor affordability adjustment .										
(U) Schedule: N/A										
(U) Technical: N/A										
<b>C. (U) <u>Other Program Funding Summary</u></b>		<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	To	Total
<b>(APPN, BLI #, NOMEN)</b>										
(U) PMC Line (BLI #509300) LVSR		0	0	0	0	0	0	31807	<u>Compl</u> CONT.	<u>Cost</u> CONT.
 <b>(U) Related RDT&amp;E</b>										
(U) PE 0206623M Marine Corps Ground Combat Supporting Arms Systems										



RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)

DATE February 1998

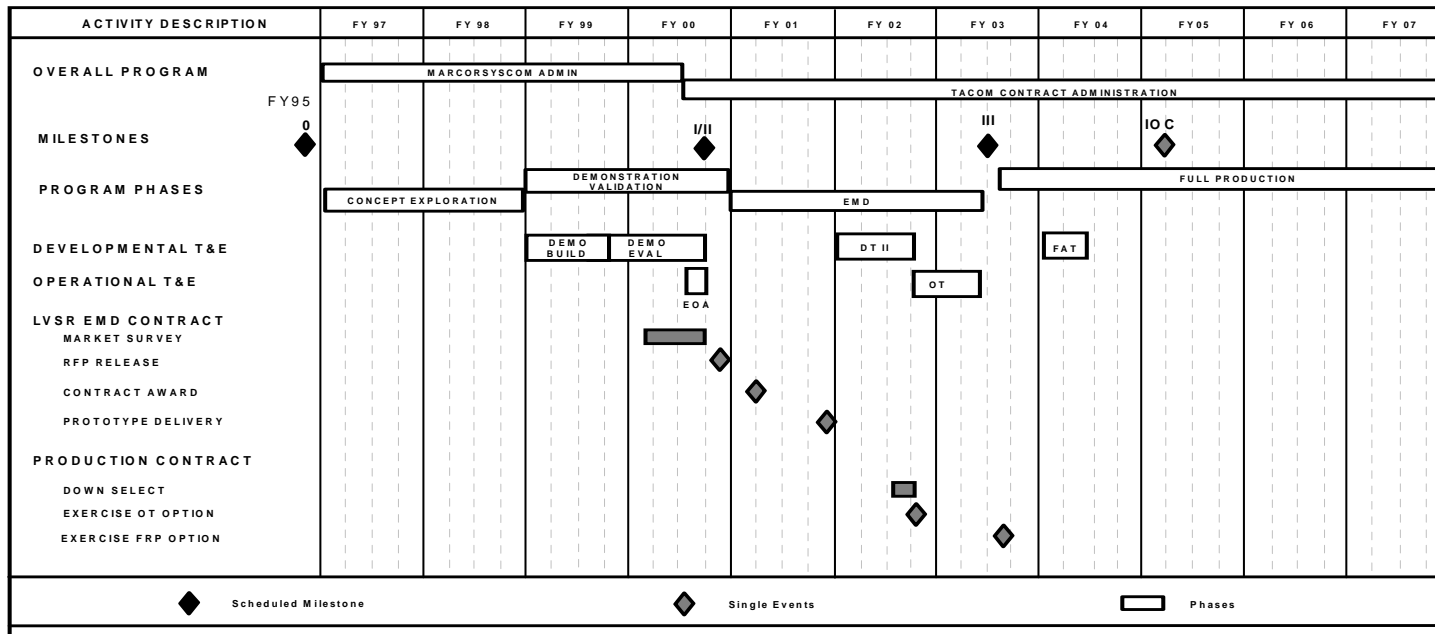
BUDGET ACTIVITY  
7 - Operational System Development

PE NUMBER AND TITLE  
0206624M Marine Corps Combat Services Support

PROJECT  
C0201

D. (U) Schedule Profile:

LOGISTICS VEHICLE SYSTEM REPLACEMENT PROGRAM  
Schedule



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<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)</b>							DATE <b>February 1998</b>			
BUDGET ACTIVITY <b>7 - Operational System Development</b>				PE NUMBER AND TITLE <b>0206624M Marine Corps Combat Services Support</b>				PROJECT <b>C2316</b>		
COST (In Thousands)	FY 1997 Actual	FY 1998 Estimate	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	Cost to Complete	Total Cost	
C2316 Combat Service Support Engineering Equipment	1079	836	1756	1586	834	139	148	Continuing	Continuing	
Quantity of RDT&E Articles										
<p><b>A. (U) Mission Description and Budget Item Justification:</b> This project includes improvements in all areas of Combat Service Support Equipment. The Army developed Combat Breacher Vehicle (CBV) will be a fully tracked, armored vehicle capable of keeping pace with the maneuver force. It will breach minefields with a full width mine plow, (14 feet wide), equipped with automatic depth control while maintaining speeds of 4 to 5 miles per hour. The CBV, also referred to as the Grizzly, is a full-tracked, heavy-protection level combat system being developed by the Army to enhance the combat breaching capabilities of the ground combat elements. The overall system is integrated on the M1 chassis to provide commonality with the tank fleet while providing the latest technology in direct fire armor protection and will provide capabilities to breach minefields, neutralize obstacles, demolish berms, and fill in auto-tank ditches. Major subsystems of the CBV include an automatic depth control system, a weapon systems station, a commander's control station, and a power driven arm. The Marine Corps is coordinating with the Army to establish a joint program. The 1500 Reverse Osmosis Water Purification Unit (1500ROWPU) is capable of providing potable water from any available raw water source. The 1500ROWPU is "state-of-the-art" technology producing 1,200/1,500 gallons per hour (GPH). This system will replace the aging 600 GPH ROWPUs at a 2 old systems to 1 enhanced system ratio. The 1500ROWPU will reduce support personnel, logistics, maintenance, and transportation requirements allowing significant potential cost avoidance in out year support costs. The 1500ROWPU is a joint Marine Corps program with the Army as the lead service. The current Twin Agent Unit (TAU) firefighting apparatus is mounted on a modified Commercial Utility, Cargo Vehicle (CUCV). The CUCV has reached its service life and is being phased out of the Marine Corps' inventory by FY 1997. Funds will be used to determine the reconfiguration of the current TAU and the Truck, Utility, Cargo, D1180, into a compatible mobile extinguisher. The Third Echelon Test Set (TETS) is a portable, highly mobile general purpose automatic tester designed for use by technicians both in garrison and at the forward edge of the battlefield. Corrosion Prevention and Control (CPAC) provides corrosion engineering support and tests material alternatives to reduce corrosion damage on various pre-milestone III programs.</p> <p><b>(U) FY 1997 Accomplishments:</b></p> <ul style="list-style-type: none"> <li>• (U) \$ 18 CBV - Conduct a shipboard compatibility study.</li> <li>• (U) \$ 350 CPAC - Initiated corrosion engineering efforts for pre-milestone III programs, including AAA and others.</li> <li>• (U) \$ 711 TETS - Completed Basic and RF bid sample testing by Naval Research Laboratory, Washington, D.C. Completed Test Program Set Research at Albany, GA.</li> </ul>										
Project C2316			Page 171 - 15 of 171 - 19 Pages				Exhibit R-2			

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<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)</b>		DATE <b>February 1998</b>																
<b>BUDGET ACTIVITY</b> <b>7 - Operational System Development</b>	<b>PE NUMBER AND TITLE</b> <b>0206624M Marine Corps Combat Services Support</b>	<b>PROJECT</b> <b>C2316</b>																
<p>(U)Total \$ 1,079</p> <p><b>(U) FY 1998 Planned Program:</b></p> <ul style="list-style-type: none"> <li>• (U) \$ 437 1500ROWPU: Design and fabrication of a working 1500ROWPU prototype to confirm the design decisions based on componentry testing.</li> <li>• (U) \$ 113 TETS: Initiate research of EO Test Requirements and capabilities of Commercial and other Services EO Tester. Develop new technology testing applications in support of emerging Weapon System by ATSU, Albany, GA.</li> <li>• (U) \$ 286 TWIN AGENT UNIT, MOBILE: Complete combined DT and OT&amp;E.</li> </ul> <p>(U)Total \$ 836</p> <p><b>(U) FY 1999 Planned Program:</b></p> <ul style="list-style-type: none"> <li>• (U) \$ 915 CBV: Evaluation and testing of CBV/minefield marking capabilities/amphibious shipboard compatibility.</li> <li>• (U) \$ 727 1500ROWPU: Test and evaluation of the 1500ROWPU prototype to include required changes to componentry to optimize the design hardware.</li> <li>• (U) \$ 114 TETS: Develop new technology testing applications in support of emerging weapon systems.</li> </ul> <p>(U)Total \$ 1,756</p>																		
<p><b>B. (U) <u>Project Change Summary</u></b></p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 40%;"></th> <th style="text-align: center;"><u>FY 1997</u></th> <th style="text-align: center;"><u>FY 1998</u></th> <th style="text-align: center;"><u>FY 1999</u></th> </tr> </thead> <tbody> <tr> <td>(U) Previous President's Budget</td> <td style="text-align: center;">469</td> <td style="text-align: center;">862</td> <td style="text-align: center;">1820</td> </tr> <tr> <td>(U) Adjustments to Previous President's Budget</td> <td style="text-align: center;">610</td> <td style="text-align: center;">-26</td> <td style="text-align: center;">-64</td> </tr> <tr> <td>(U) Current Budget Submit</td> <td style="text-align: center;">1079</td> <td style="text-align: center;">836</td> <td style="text-align: center;">1756</td> </tr> </tbody> </table> <p>(U) Change Summary Explanation:            (U) Funding: Increase +\$260K due to recognition of increased costs during the execution of the TETS program; mid-year increase +\$350K to fund the CPAC. FY 1999 decreased funds in the amount of \$1 thousand reflect a NWCF - Marine Corps Depot Rate Adjustment and the decreased amount of \$63 thousand is due to a minor affordability adjustment.</p>				<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	(U) Previous President's Budget	469	862	1820	(U) Adjustments to Previous President's Budget	610	-26	-64	(U) Current Budget Submit	1079	836	1756
	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>															
(U) Previous President's Budget	469	862	1820															
(U) Adjustments to Previous President's Budget	610	-26	-64															
(U) Current Budget Submit	1079	836	1756															
Project C2316	Page 171 - 16 of 171 - 19 Pages	Exhibit R-2																

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<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)</b>								DATE <b>February 1998</b>	
<b>BUDGET ACTIVITY</b> <b>7 - Operational System Development</b>				<b>PE NUMBER AND TITLE</b> <b>0206624M Marine Corps Combat Services Support</b>				<b>PROJECT</b> <b>C2316</b>	
<p>(U) Schedule: TETS underwent DOD IG Audit. Contract Award subsequently delayed to 4<sup>th</sup> QTR FY 97, Field Qualification Test (FQT) delayed to 2<sup>nd</sup> QTR FY 98.</p> <p>(U) Technical: N/A</p>									
<b>C. (U) <u>Other Program Funding Summary</u></b>									
<b>(APPN, BLI #, NOMEN)</b>									
	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>To</u>	<u>Total</u>
(U) PMC Line (BLI# 613300) CBV	0	0	0	0	0	54,399	69,945	<u>Compl</u>	<u>Cost</u>
(U) PMC LINE (BLI# 627400) 1500ROWPU	0	0	0	0	33,314	25,645	24,699	Cont	Cont
(U) PMC LINE (BLI# 666900) TAU	0	0	1,109	0	0	0	0	0	1,109
(U) PMC Line 33 (BLI# 440200) TETS	11,553	11,845	19,312	29,181	0	0	0	0	73,816
<b>(U) <u>Related RDT&amp;E</u></b>									
(U) PE 0206623M Marine Corps Ground Combat Supporting Arms Systems									
(U) PE 0603640M Marine Corps Advanced Technology Demonstration									
(U) PE 0604804A Logistics and Engineering Equip/Engr Development									
(U) PE 0206313M Marine Corps Communications									
<b>D. (U) <u>Schedule Profile:</u> N/A</b>									

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1998	
BUDGET ACTIVITY <b>7 - Operational System Development</b>					PE NUMBER AND TITLE <b>0206624M Marine Corps Combat Services Support</b>					PROJECT <b>C2316</b>	
<b>A. (U) Project Cost Breakdown</b>											
					<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>				
Production Development					201	554	1741				
Support and Management					368	45	15				
Test and Evaluation					510	237	0				
Total					1079	836	1756				
<b>B. Budget Acquisition History and Planning Information</b>											
<b>Performing Organizations</b>											
Contractor or Government	Contract Method/Type	Award or Obligation	Performing Activity	Project Office	Total Prior to				Budget to	Total	
Performing Activity	Vehicle	Date	EAC	EAC	FY 1997	FY 1997	FY 1998	FY 1999	Complete	Program	
<b>Product Development Organizations</b>											
Miscellaneous	Various	Various			0	201	113	1002	CONT	CONT	
TACOM	MIPR				0	0	441	739	CONT	CONT	
<b>Support and Management Organizations</b>											
MKI	RCP				0	18	0	0	0	18	
MARCORSYSCOM	WR				0	350	0	0	0	350	
Miscellaneous	Various	Various			0	0	45	15	CONT	CONT	
<b>Test and Evaluation Organizations</b>											
Miscellaneous	Various	Various			0	510	0	0	0	510	
TBD	RCP				0	0	237	0	0	237	
<b>Government Furnished Property</b>											
Item	Contract Method/Type	Award or Obligation	Delivery		Total Prior to				Budget to	Total	
Description	Vehicle	Date	Date		FY 1997	FY 1997	FY 1998	FY 1999	Complete	Program	
<b>Product Development Property</b>											
N/A											
<b>Support and Management Property</b>											
N/A											
<b>Test and Evaluation Property</b>											
N/A											
Project C2316					Page 171 - 18 of 171 - 19 Pages				Exhibit R-3		

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<b>RDT&amp;E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)</b>	DATE <b>February 1998</b>
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<b>BUDGET ACTIVITY</b> <b>7 - Operational System Development</b>	<b>PE NUMBER AND TITLE</b> <b>0206624M Marine Corps Combat Services Support</b>	<b>PROJECT</b> <b>C2316</b>
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	Total Prior to <u>FY 1997</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	Budget to <u>Complete</u>	Total <u>Program</u>
Subtotal Product Development		201	554	1741	CONT	CONT
Subtotal Support and Management		368	45	15	CONT	CONT
Subtotal Test and Evaluation		510	237	0	747	747
Total Project		1079	836	1756	CONT	CONT

# UNCLASSIFIED

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0207161N

PROGRAM ELEMENT TITLE: TACTICAL AIR INTERCEPT

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 <u>ACTUAL</u>	FY 1998 <u>ESTIMATE</u>	FY 1999 <u>ESTIMATE</u>	FY 2000 <u>ESTIMATE</u>	FY 2001 <u>ESTIMATE</u>	FY 2002 <u>ESTIMATE</u>	FY 2003 <u>ESTIMATE</u>	TO <u>COMPLETE</u>	TOTAL <u>PROGRAM</u>
E0457 AIM-9X	45,319	57,946	65,855	42,711	20,872	9,666	6,062	0	276,483
RDT&E,N Articles		6	9	11					26

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The AIM-9X Sidewinder program is a joint USN/USAF effort to continue the evolutionary development of the AIM-9 missile. The AIM-9X is the long term evolution of the AIM-9 that will provide a series of modifications to the AIM-9 improving seeker/guidance and kinematic performance which will be fielded in the post-2000 timeframe. Funding for AIM-9X activities beyond FY 1994 will be provided equally in the aggregate by the USN and USAF.

B. (U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it encompasses engineering and manufacturing development for modifying existing, operational systems.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS: (Navy Share Only)

- (U) (\$27,543) Obtained Milestone (MS)-II approval, awarded Engineering Manufacturing Development (EMD) contract, flying captive seeker hardware, and conducted Design Review I (DRI) in July 1997.
- (U) (\$5,190) Provided aircraft interface information to EMD contractor.
- (U) (\$11,088) Monitored EMD contract, began government Developmental Test (DT)-IIA and provide consulting services support.
- (U) (\$1,498) Provided headquarters/field travel to support EMD program activities.

Exhibit R-2

# UNCLASSIFIED

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7            PROGRAM ELEMENT: 0207161N            PROJECT NUMBER: E0457  
PROGRAM ELEMENT TITLE: TACTICAL AIR INTERCEPT            PROJECT TITLE: AIM-9X

2. (U) FY 1998 PLAN: (Navy Share Only)

- (U) (\$35,080) Continue EMD, conduct Design Review II (DR II), fly Captive Test Units, and start delivery of safe separation vehicles for DT-IIB.
- (U) (\$7,590) Continue providing aircraft interface information to EMD contractor to include any available wind tunnel data.
- (U) (\$11,514) Continue monitoring EMD contract, continue DT-IIA flight testing, complete DT-IIA within the fourth quarter, begin preparations for DT-IIB, start DT-IIB, and provide consulting services support.
- (U) (\$1,980) Headquarters/field travel.
- (U) (\$1,782) Begin digital upgrade modification to LAU-7 launcher.

3. (U) FY 1999 PLAN: (Navy Share Only)

- (U) (\$31,505) Continue EMD efforts.
- (U) (\$9,110) Continue providing aircraft interface to the EMD contractor. Relate results of wind tunnel testing to missile/platform interface and compatibility efforts.
- (U) (\$20,553) Continuation of EMD contractor monitoring, complete DT-IIB, start DT-IIC, and provide consulting services support.
- (U) (\$1,917) Headquarters/field travel.
- (U) (\$2,770) Continue digital upgrade to LAU-7 launcher.

Exhibit R-2



**UNCLASSIFIED**

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0207161N

PROJECT NUMBER: E0457

PROGRAM ELEMENT TITLE: TACTICAL AIR INTERCEPT

PROJECT TITLE: AIM-9X

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	52,463	60,079	66,040
(U) Appropriated Value:	54,915		
(U) Adjustments from PRESBUDG:	-7,144	-2,133	-185
(U) FY 1999 President's Budget Submit:	45,319	57,946	65,855

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1997 net reduction of -\$7,144 thousand includes a -\$1,380 thousand Small Business Innovative Research transfer, funds in the amount of -\$5,698 thousand reprogrammed to other programs reflecting actual EMD contract costs, and a -\$66 thousand Revised Economic Adjustment. The FY 1998 reduction of -\$2,133 thousand reflects -\$351 thousand in contractor advisory and assistance services and -\$1,782 thousand for Congressional price adjustments. The FY 1999 net reduction of -\$185 thousand includes -\$1,160 thousand for inflation adjustment and \$975 thousand for minor pricing adjustments.

(U) Schedule: FY 1997 T&E Milestone for DT-IIA reflects a change from an estimated date to a firm date. FY 1998 Engineering Milestone for DR II reflects a change from an estimated date to a firm date. TO COMPLETE for TRR TECHEVAL, TRR for OPEVAL and OT-IIB were changed due to a previous error interpreting the Program Master Schedule.

(U) Technical: Not applicable.

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

WPN	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>TO COMPLETE</u>	<u>TOTAL PROGRAM</u>
Qty	75	125	300	300	4,200	5,000
Dollars	32,043	35,522	62,011	66,352	1,229,973	1,425,901

(U) RELATED RDT&E:

- (U) DA PE 0603715D (AIM-9 CONSOLIDATED PROGRAM)
- (U) AF PE 0207161F (TACTICAL AIM MISSILE)

Exhibit R-2

# UNCLASSIFIED

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0207161N

PROJECT NUMBER: E0457

PROGRAM ELEMENT TITLE: TACTICAL AIR INTERCEPT

PROJECT TITLE: AIM-9X

## D. (U) SCHEDULE PROFILE:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>TO COMPLETE</u>
Program Milestones	1Q MS-II			2Q/00 LRIP DAB
Engineering Milestones	4Q DR I	2Q DR II		2Q/00 TRR TECHEVAL 1Q/01 TRR for OPEVAL
T&E Milestones	3Q/97-4Q/98 DT-IIA	4Q/98-4Q/99 DT-IIB/C	1Q/99-3Q/00 DT-IID 4Q/99-1Q/00 OT-IIA	1Q/01-4Q/01 OT-IIB
Contract Milestones		1Q Award EMD Contract		2Q/00 LRIP

Exhibit R-2

**UNCLASSIFIED**

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

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0207161N

PROJECT NUMBER: E0457

PROGRAM ELEMENT TITLE: TACTICAL AIR INTERCEPT

PROJECT TITLE: AIM-9X

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

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Primary Hardware Development	27,543	35,080	31,505
b. Government Engineering Support	7,440	6,920	8,620
c. Contractor Engineering Support	5,190	7,590	9,110
d. Miscellaneous	2,714	2,801	3,031
e. Development Test & Evaluation	2,005	3,535	10,550
f. Headquarters Travel	427	238	269
g. LAU-7 Launcher	0	1,782	2,770
Total	45,319	57,946	65,855

Exhibit R-3

**UNCLASSIFIED**

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

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0207161N

PROJECT NUMBER: E0457

PROGRAM ELEMENT TITLE: TACTICAL AIR INTERCEPT

PROJECT TITLE: AIM-9X

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

PERFORMING ORGANIZATIONS

<u>Contractor/ Government Performing Activity</u>	<u>Contract Method/ Fund Type Vehicle</u>	<u>Award/ Oblig Date</u>	<u>Perform Activity EAC</u>	<u>Project Office EAC</u>	<u>*Total FY 1996 &amp; Prior</u>	<u>FY 1997 Budget</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Product Development										
Hughes										
Tucson AZ	C/CPIF	DEC 94	6,685	6,685	6,685				0	6,685
Raytheon										
Bedford MA	C/CPIF	DEC 94	8,587	8,587	8,587				0	8,587
Hughes(EMD)										
Tucson AZ	C/CPIF/AF	DEC 96	129,318	129,318	0	27,543	35,080	31,505	35,190	129,318
McDonnell-Douglas										
St Louis MO	C/CPFF	JAN 95	24,397	24,397	1,187	5,190	7,590	9,110	1,320	24,397
NAWC CL	WR	OCT 99	69,362	69,362	9,744	8,231	10,455	19,170	21,762	69,362
MISC I/H (Efforts < \$2.0M)										
	VARIOUS	VARIOUS	9,502	9,502	713	2,712	1,980	1,917	2,180	9,502
GOVT (TBD)	WR	OCT 99	21,922	21,922			1,782	2,770	17,370	21,922
Support and Management										
Various Contracts	TBD	OCT 99	TBD	6,710	1,136	1,643	1,059	1,383	1,489	6,710

Test and Evaluation (Included in Product Development)

\* FY95 and prior funded under P.E. 0603715D. FY96 funded under P.E. 0207161N.

Exhibit R-3

**UNCLASSIFIED**

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

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0207161N

PROJECT NUMBER: E0457

PROGRAM ELEMENT TITLE: TACTICAL AIR INTERCEPT

PROJECT TITLE: AIM-9X

GOVERNMENT FURNISHED PROPERTY (Not Applicable)

	<u>*Total FY 1996 &amp; Prior</u>	<u>FY 1997 Budget</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Subtotal Product Development	26,916	43,676	56,887	64,472	77,822	269,773
Subtotal Support and Management	1,136	1,643	1,059	1,383	1,489	6,710
Subtotal Test and Evaluation	0	0	0	0	0	0
Total Project	28,052	45,319	57,946	65,855	79,311	276,483

\* FY95 and prior funded under P.E. 0603715D. FY96 funded under P.E. 0207161N

Exhibit R-3

# UNCLASSIFIED

DATE: February 1998

## FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0207163N  
PROGRAM ELEMENT TITLE: AMRAAM

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
E0981 AMRAAM	2,128	5,479	4,862	4,647	4,434	4,497	4,590	Cont.	Cont.
TOTAL									

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This joint Navy/Air Force program is structured in response to the Joint Service Operational Requirement and Mission Element Need Statement to develop an air superiority air-to-air missile with significant improvements in operational utility and combat effectiveness. This program supports the integration of the AMRAAM into Navy aircraft with analysis of Navy unique applications, simulation capability development, aircraft missile integration tasks, pre-planned product improvement (P3I) efforts, and procurement of hardware to support Navy test and evaluation tasks.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it encompasses engineering and manufacturing development for upgrade of existing, operational systems.

- (U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$2,128) Continued participation in AMRAAM P3I Phase 2 and began P3I Phase 3 risk reduction programs with emphasis on Navy unique requirements and aircraft integration compatibility requirements. Participated in technical planning for post Phase 2 RDT&E activities to support Cost Operational Effectiveness Analysis results. Completed flight testing of the extended length rocket motor. Obtained Initial Operating Capability (IOC) of P3I Phase 2 missiles.

R-1 Item No. 173

# UNCLASSIFIED

# UNCLASSIFIED

DATE: February 1998

## FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0207163N  
PROGRAM ELEMENT TITLE: AMRAAM

PROJECT NUMBER: E0981  
PROJECT TITLE: AMRAAM

### 2. (U) FY 1998 PLAN:

- (U) (\$5,479) Continue systems engineering and participation in AMRAAM P3I Phase 2 EMD and Phase 3 risk reduction program (incorporating additional Air Force funding of \$39,875) with emphasis on Navy unique requirements and aircraft integration compatibility requirements.

### 3. (U) FY 1999 PLAN:

- (U) (\$4,862) Initiate systems engineering and participation in AMRAAM P3I Phase 3 EMD program (incorporating additional Air Force funding of \$45,078) with emphasis on Navy unique requirements and aircraft integration compatibility requirements. Conduct P3I Phase 3 Preliminary Design Review.

R-1 Item No. 173

# UNCLASSIFIED

**UNCLASSIFIED**

DATE: February 1998

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0207163N  
PROGRAM ELEMENT TITLE: AMRAAM

PROJECT NUMBER: E0981  
PROJECT TITLE: AMRAAM

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	2,274	5,700	4,855
(U) Appropriated Value:	2,274		
(U) Adjustments from PRESBUDG:	-146	-221	+7
(U) FY 1999 President's Budget:	2,128	5,479	4,862

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY 1997 reduction includes -\$18 thousand for Small Business Innovation Research assessment, and -\$128 for Congressional adjustments. The FY 1998 reduction includes -\$52 thousand for Advisory and Assistance Services, -\$169 thousand for general and inflation adjustments. The FY 1999 net increase reflects +\$118 thousand for Navy Working Capital Fund (NWCFF) adjustments, +\$38 thousand for pricing adjustments, and a reduction of -\$149 thousand for inflation adjustments

(U) Schedule: P3I-2 Flight Test slipped to the fourth quarter due to the non-availability of a shortened control actuator system and Air Force reductions in FY 1997 R&D funding. P3I-3 EMD contract award moved to first quarter FY 1999 as directed by FY 1998 Congressional language (No impact to Navy funding). P3I-3 PDR moved to third quarter due to the contract award change.

(U) Technical: Not Applicable

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

WPN/P1#6	<u>FY 1997</u> <u>ACTUAL</u>	<u>FY 1998</u> <u>ESTIMATE</u>	<u>FY 1999</u> <u>ESTIMATE</u>	<u>FY 2000</u> <u>ESTIMATE</u>	<u>FY 2001</u> <u>ESTIMATE</u>	<u>FY 2002</u> <u>ESTIMATE</u>	<u>FY 2003</u> <u>ESTIMATE</u>	<u>TO</u> <u>COMPLETE</u>	<u>TOTAL</u> <u>PROGRAM</u>
Qty	100	120	115	115	100	150	125	531	2,419
\$	50,252	55,250	62,641	61,328	55,921	80,339	69,273	317,533	1,618,162

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**UNCLASSIFIED**



# UNCLASSIFIED

DATE: February 1998

## FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0207163N  
PROGRAM ELEMENT TITLE: AMRAAM

PROJECT NUMBER: E0981  
PROJECT TITLE: AMRAAM

(U) RELATED RDT&E:

- (U) PE 0207130F F-15
- (U) PE 0204136N F/A-18 Squadrons
- (U) PE 0207163F AMRAAM P3I
- (U) PE 0207133F F-16
- (U) PE 0604239F F-22
- (U) PE 0207134F F-15E

D. (U) SCHEDULE PROFILE:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>To Complete</u>
Program Milestones	2Q IOC P3I-2		1Q P3I-3 EMD CTK AWD	
Engineering Milestones			3Q P3I-3 PDR	
T&E Milestones	2-4Q P3I-2 FLT TEST	4Q P3I-2 FLT TEST		
Contract Milestones				

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# UNCLASSIFIED

**UNCLASSIFIED**

DATE: February 1998

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

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0207163N  
PROGRAM ELEMENT TITLE: AMRAAM

PROJECT NUMBER: E0981  
PROJECT TITLE: AMRAAM

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

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. System Integration	330	340	300
b. Pre-Planned Product Improvement	996	3,425	2,584
c. Systems Engineering	542	1,434	1,698
d. Travel	260	280	280
Total	2,128	5,479	4,862

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**UNCLASSIFIED**

**UNCLASSIFIED**

DATE: February 1998

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

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0207163N  
PROGRAM ELEMENT TITLE: AMRAAM

PROJECT NUMBER: E0981  
PROJECT TITLE: AMRAAM

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

PERFORMING ORGANIZATIONS

<u>Contractor/</u> <u>Government</u> <u>Performing</u> <u>Activity</u>	<u>Contract</u> <u>Method/</u> <u>Fund Type</u> <u>Vehicle</u>	<u>Award/</u> <u>Oblig</u> <u>Date</u>	<u>Perform</u> <u>Activity</u> <u>EAC</u>	<u>Project</u> <u>Office</u> <u>EAC</u>	<u>Total</u> <u>FY 1996</u> <u>&amp; Prior</u>	<u>FY 1997</u> <u>Budget</u>	<u>FY 1998</u> <u>Budget</u>	<u>FY 1999</u> <u>Budget</u>	<u>To</u> <u>Complete</u>	<u>Total</u> <u>Program</u>
Product Development										
ALLIANT TECH	C/FFP	Sep 95	3,549	3,549	3,549	0	0	0	0	3,549
NAWC WD	Various WX	Oct 98	Cont.	Cont.	34,665	833	3,770	3,338	Cont.	Cont.
Misc	Var	Oct 98	Cont.	Cont.	3,089	908	1,059	900	Cont.	Cont.
Support and Management										
Misc	WX	Oct 98	Cont.	Cont.	6,196	387	650	624	Cont.	Cont.
Test and Evaluation										
NAWC WD Pt Mugu,CA	WX	Nov 95	12,755	12,755	12,755	0	0	0	0	12,755

GOVERNMENT FURNISHED PROPERTY: NOT APPLICABLE

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**UNCLASSIFIED**

DATE: February 1998

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

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0207163N  
PROGRAM ELEMENT TITLE: AMRAAM

PROJECT NUMBER: E0981  
PROJECT TITLE: AMRAAM

Item	Contract Method/ Fund Type	Award/ Oblig	Delivery	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
<u>Description</u>	<u>Vehicle</u>	<u>Date</u>	<u>Date</u>						
Product Development									
Support and Management									
Test and Evaluation									
				<u>Total FY 1996 &amp; Prior</u>	<u>FY 1997 Budget</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Subtotal Production Development				41,303	1,741	4,829	4,238	Cont.	Cont.
Subtotal Support and Management				6,196	387	650	624	Cont.	Cont.
Subtotal Test and Evaluation				12,755	0	0	0	0	12,755
Total Project				60,254	2,128	5,479	4,862	Cont.	Cont.

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**UNCLASSIFIED**

# UNCLASSIFIED

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0303109N

PROGRAM ELEMENT TITLE: Satellite Communications

(U) COST: (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
X1880 Joint Terminal Project Office	1,734	0	0	0	0	0	0	CONT.	CONT.
X0728 EHF SATCOM Terminals	13,628	15,464	16,068	8,595	7,514	6,771	7,877	CONT.	CONT.
X0731 Fleet Satellite Communications	16,638	792	2,120	2,798	1,492	1,490	1,533	CONT.	CONT.
<b>TOTAL</b>	<b>32,000</b>	<b>16,256</b>	<b>18,188</b>	<b>11,393</b>	<b>9,006</b>	<b>8,261</b>	<b>9,410</b>	<b>CONT.</b>	<b>CONT.</b>

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This program supports development of shipboard and shore based equipment operating through six communication satellite systems: Fleet Satellite (FLTSAT) Communications, Leased Satellite (LEASAT) Communications, Defense Satellite Communications System (DSCS), Ultra High Frequency Follow-On Program (UFO), NATO Allied, and Air Force Satellite Communications (AFSATCOM). The Navy Extremely High Frequency (EHF) Satellite Communications (SATCOM) Program (NESP) provides for the development and production of terminals to provide anti-jam, low probability of intercept/detection communications capability for Command and Control of the fleet. NESP operates with FLTSAT EHF packages and UFO EHF Satellite packages and is the Navy's portion of Milstar. The Milstar program is comprised of satellites, control stations, and aircraft, ship, and ground terminals to provide assured worldwide, secure, anti-jam, survivable communications for the National Command Authority, CINCs, and operational commanders. The Joint Terminal Project Office (JTPO) chartered by tri-service Memorandum of Understanding (MOU) coordinates and directs cross-service interoperability engineering in the individual Service development of EHF satellite terminals; oversees cross-service logistics and infrastructure supportability planning and execution; provides technical support to the Joint Chiefs and Service Staffs, CINCs, and operational commanders; and coordinates MILSATCOM terminal technology transfer among the Services and agencies.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it encompasses engineering and manufacturing development for upgrade of existing, operational systems.

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

DATE: February 1998

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0303109N PROJECT NUMBER: X1880  
PROGRAM ELEMENT TITLE: Satellite Communications PROJECT TITLE: Joint Terminal Project Office

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
X1880 Joint Terminal Project Office	1,734	0	0	0	0	0	0	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Milstar program is comprised of satellites, control stations, and aircraft, ship, and ground terminals to provide assured worldwide, secure, anti-jam, survivable communications for the National Command Authority, CINCs, and operational commanders. The Joint Terminal Program Office (JTPO) chartered by tri-service Memorandum of Understanding (MOU) coordinates individual Service development of MILSATCOM terminals in four areas: (1) cross service terminal interoperability engineering; (2) joint integrated logistics and C3 infrastructure support planning; (3) technical support to the Office of the Secretary of Defense (OSD), the Office of Joint Chiefs of Staff (OJCS), the Commanders in Chief (CINCs), and users and developers; and (4) identification, application and transfer of advanced technology into MILSATCOM terminals. The first Milstar satellite was placed into orbit in February 1994; the second satellite (of six) in November 1995.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS: The JTPO coordinates and directs the development of Milstar and MILSATCOM terminals in four areas: Interoperability, Logistics/Infrastructure support, User Support and Technology.

1. (U) FY 1997 PLAN:

- (U) (\$ 588) Conducted interoperability engineering for additional user interface devices and equipment identified for use with Service MILSATCOM terminals; identify and test user baseband devices to ensure interoperability through MILSATCOM systems; interoperability with DII/DISN, including STEP program; provide leadership and coordination between Service terminal developers and the Joint Interoperability Test Command (JITC) in executing CJCS interoperability certification policy; plan for and conduct joint interoperability testing in conjunction with on-orbit testing of Milstar I payloads and pre-launch testing of Milstar II payloads; and evaluate interoperability and terminal segment specification compliance of MILSATCOM terminals prior to acquisition and/or production and fielding decisions.
- (U) (\$ 338) Coordinated cross-service EHF terminal installation planning, maintain Joint Training Plan and Joint ILSP for Low Data Rate (LDR) and Medium Data Rate (MDR) EHF terminals; participate in logistics and infrastructure integrated product teams for emerging multiband MILSATCOM terminals; identify and resolve joint logistics and infrastructure support issues for MILSATCOM terminals.
- (U) (\$ 347) Supported AFSPC, the OJCS, CINCs, and users in technical network planning, and assist in refining system technical applications and expanding operational use of Milstar.
- (U) (\$ 375) Finalized advanced EHF system documentation, with focus on user-to-user interoperability system engineering in the terminal segments. Continue Space Architecture development supporting DoD Space Architect. Maximize opportunities for MILSATCOM terminal technology transfer by identifying emerging technologies, maintaining MILSATCOM technology database, and

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

DATE: February 1998

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0303109N PROJECT NUMBER: X1880  
PROGRAM ELEMENT TITLE: Satellite Communications PROJECT TITLE: Joint Terminal Project Office

recommending appropriate technology insertion points for NDI/COTS. Participate in international efforts to achieve user-to-user interoperability standardization in MILSATCOM.

- (U) (\$ 86) Developed and update Naval Command, Control, Communications, Computers, Intelligence, Sensors and Reconnaissance (C4ISR) implementation guidance.

2. (U) FY 1998 PLAN:

Not applicable

3. (U) FY 1999 PLAN:

Not applicable

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	2,924	0	0
(U) Appropriated Value			
(U) Adjustments from FY 1998 PRESBUDG:	-1,190	0	0
(U) FY 1999 President's Budget Submit:	1,734	0	0

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding:

FY 1997: Reflects SBIR Transfer(\$-73K), programmatic adjustments (\$-1,113K), and revised economic assumptions \$-4K).  
{total: \$-1,190K}

(U) Schedule: Not Applicable.

(U) Technical: Not Applicable.

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

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

DATE: February 1998

BUDGET ACTIVITY: 7    PROGRAM ELEMENT: 0303109N    PROJECT NUMBER: X1880  
PROGRAM ELEMENT TITLE: Satellite Communications    PROJECT TITLE: Joint Terminal Project Office

D. (U) SCHEDULE PROFILE: Not applicable.

A. (U) PROJECT COST BREAKDOWN: Not Applicable.

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION: Not Applicable.

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

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0303109N

PROJECT NUMBER: X0728

PROGRAM ELEMENT TITLE: Satellite Communications

PROJECT TITLE: EHF SATCOM Terminals

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
X0728 EHF SATCOM Terminals	13,628	15,464	16,068	8,595	7,514	6,771	7,877	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: Navy Extremely High Frequency (EHF) Satellite Communications (SATCOM) Program provides for the development and production of terminals to provide anti-jam, low probability of intercept/detection communications capability for Command and Control of the fleet. The terminals will provide physical and electromagnetically survivable, worldwide communications in the current and projected electromagnetic and nuclear threat. Navy EHF terminals are interoperable with Army and Air Force terminals and will operate with Milstar as well as EHF packages on-board Ultra High Frequency (UHF) Follow-On (UFO) Satellites 4 through 10 and FLTSATCOM Satellites 7 and 8. Navy terminals operated during Desert Storm with EHF packages on-board Fleet Satellite 8 and supported fleet operations in Haiti. The increased capability provided by EHF terminals is accomplished by use of the wider bandwidths available at extremely high frequencies, narrow antenna beamwidths, spread spectrum techniques, on-board satellite processing, and advanced signal processing technology.

(U) A Medium Data Rate (MDR) capability is currently under development to utilize the capabilities on Milstar satellites DFS-3 through DFS-6. MDR will provide the only protected (jam resistant and low probability of intercept/detection) MDR data rates from 4.8 kilobits per second (Kbps) to 1.544 megabits per second (Mbps) to the majority of the fleet.

(U) The Navy EHF Communications Controller (NECC) provides automated, netted tactical data Information Exchange Subsystems (IXS) over jam resistant EHF satellite links. The NECC will provide for load and channel sharing, resource management, communications management and planning, network control and monitoring, and services including circuit switching, packet switching, and backward compatibility to UHF SATCOM.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 PLAN:

- (U) (\$ 9,021) Continued EDM MDR modem and modification kits development and deliver initial kits. Commence ILS development for MDR. Develop and fabricate a ten foot MDR Shore antenna. Begin MDR SATSIM development.
- (U) (\$ 872) Started MDR on-ground cover test (MST 3600) and conduct development testing with the Navy MDR terminal, Army MDR terminals and the Milstar MDR satellite design verification model (MST 4000).
- (U) (\$ 543) Commenced development of MDR mods to NECC.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7                    PROGRAM ELEMENT: 0303109N                    PROJECT NUMBER: X0728  
PROGRAM ELEMENT TITLE: Satellite Communications                    PROJECT TITLE: EHF SATCOM Terminals

- (U) (\$ 2,764) Continued Milstar terminal and MDR development engineering analysis and management.
- (U) (\$ 428) Developed and update Naval Command, Control, Communications, Computers, Intelligence, Sensors and Reconnaissance (C4ISR) implementation guidance.

2. (U) FY 1998 PLAN:

- (U) (\$ 8,691) Deliver additional EDM MDR modem and modification kits; continue MDR ILS development; complete MDR software development; continue MDR SATSIM development; and perform system integration testing to meet MST testing schedule.
- (U) (\$ 1,503) Perform developmental and interoperability testing (MST-6000) with Navy MDR terminal, Army MDR terminal, and the on-ground flight model Milstar MDR satellite to verify compatibility prior to launch of first Milstar satellite in FY 99.
- (U) (\$ 1,031) Continue development of NECC interface with MDR.
- (U) (\$ 1,039) Commence development of Submarine Reportback Compression/Encryption capability to provide transmit and receive message processing for reportback messages to support tactical brevity coding, reportback message compression, and KGV-11 time of day encryption.
- (U) (\$ 294) Develop and update Naval Command, Control, Communications, Computers, Intelligence, Sensors and Reconnaissance (C4ISR) implementation guidance.
- (U) (\$ 2,906) Continue Milstar terminal and MDR development engineering analysis and management.

3. (U) FY 1999 PLAN:

- (U) (\$ 6,749) Perform MDR software corrections resulting from MST-6000 testing with flight model MDR satellite. Continue MDR ILS development; prepare MDR software documentation; perform software configuration management; perform system testing; support installation, checkout, and integration of EDM antenna/pedestals on operational platforms, EDM MDR modems, and field change kits in support of MST testing; and complete MDR SATSIM development and modifications.
- (U) (\$ 600) Perform ship and shore integration for MDR upgrade.
- (U) (\$ 1,600) Perform MST-8000 development testing with initial AN/USC-38(V) with MDR, Army MDR terminal, and on-orbit Milstar satellite with MDR to verify compatibility.
- (U) (\$ 3,133) Perform TECHEVALs/OPEVALs for Navy MDR and participate in Milstar MDR IOT&E.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0303109N      PROJECT NUMBER: X0728  
 PROGRAM ELEMENT TITLE: Satellite Communications      PROJECT TITLE: EHF SATCOM Terminals

- (U) (\$ 1,125) Continue development of NECC modifications. Conduct developmental and operational testing of MDR capable NECC units.
- (U) (\$ 1,551) Develop modifications required to maintain compatibility with future EHF satellite constellations (i.e., Advanced EHF). Investigate antenna technology advancements including phased array and flat plate antennas. Begin investigation of Radar Cross Section (RCS) vulnerability reduction measures.
- (U) (\$ 1,310) Continue Milstar terminal and MDR development engineering analysis and management.

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	14,416	16,177	25,161
(U) Appropriated Value:			
(U) Adjustments from FY 1998 PRESBUDG:	-788	-713	-9,093
(U) FY 1999 President's Budget Submit:	13,628	15,464	16,068

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding:

FY 1997: Reflects SBIR transfer (\$-344K), reprogramming to other higher priority Navy programs (\$-419K), revised economic adjustments (\$-18K), and other minor Navy adjustments (\$-7K). {total: \$-788K}  
 FY 1998: Reflects Congressional Undistributed general reductions (\$-677K) and revised economic assumptions (\$-36K) {total: \$-713K}  
 FY 1999: Redirection to develop and update overarching C4ISR mission requirements (\$-267K), decrease for IT21 EHF Terminals (\$-8,500K), NWCF adjustments (\$+79K), programmatic adjustments (\$-147K), inflation adjustments (\$-258K). {total: \$-9,093K}

(U) Schedule: The FY 1999 adjustment of \$-9,093K delays development of terminal upgrades and Advanced EHF until the out years.

(U) Technical: Not applicable.

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

FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
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Budget Item Justification  
(Exhibit R-2, Page 7 of 18)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7	PROGRAM ELEMENT: 0303109N	PROJECT NUMBER: X0728
	PROGRAM ELEMENT TITLE: Satellite Communications	PROJECT TITLE: EHF SATCOM Terminals
OPN SHIP* 54,127 321000	34,215 57,136 71,194 52,568 56,432 61,876	CONT. CONT.
OPN SHORE* 17,310 322000	2,234 15,223 35,325 21,148 16,501 39,249	CONT. CONT.

\*Includes EHF terminal installation costs.

(U) Related RDT&E:

- (U) PE 0303603F, Milstar
- (U) PE 0303601F, Air Force Satellite Communications
- (U) PE 0303142A, Army Extremely High Frequency Communications Terminal

D. (U) SCHEDULE PROFILE:

	FY 1997	FY 1998	FY 1999
Program Milestones			MS IV (MDR Full Rate Prod) 2/99
Engineering Milestones	Deliver MDR EDMs 5/97 Commence NECC MDR development 7/97		
T&E Milestones	MDR MST4000 7/97	MDR MST6000 7/98	MDR MST8000 12/98 MDR OT 10/98
Contract Milestones	Follow-On RFP Release 7/97	MDR Initial Prod Award 1/98	

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

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0303109N

PROJECT NUMBER: X0728

PROGRAM ELEMENT TITLE: Satellite Communications

PROJECT TITLE: EHF SATCOM Terminals

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

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Project Management	520	504	688
b. Systems Engineering	2,105	2,378	2,854
c. Prime Mission Equipment	8,740	9,797	8,073
d. System Test & Evaluation	920	1,237	3,028
e. Integrated Logistics Support	663	744	825
f. Site/Platform Integration	680	804	600
Total:	13,628	15,464	16,068

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0303109N

PROJECT NUMBER: X0728

PROGRAM ELEMENT TITLE: Satellite Communications

PROJECT TITLE: EHF SATCOM Terminals

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

PERFORMING ORGANIZATIONS

<u>Contractor/ Government Performing Activity</u>	<u>Contract Method/ Fund Type Vehicle</u>	<u>Award/ Oblig Date</u>	<u>Perform Activity EAC</u>	<u>Project Office EAC</u>	<u>Total FY 1996 &amp; Prior</u>	<u>FY 1997 Budget</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Product Development										
Raytheon	SS/CPFF	1/94	53,943	53,943	15,435	6,812	7,627	8,879	CONT.	CONT.
F/O EHF Studies/Upgrades										
NRaD	WR	10/93	N/A	N/A	5,582	2,072	2,540	2,685	CONT.	CONT.
Other	Var	Var	Var	Var	2,884	775	982	971	CONT.	CONT.
Support and Management										
NRaD	WR	10/93	N/A	N/A	2,742	1,345	1,445	870	CONT.	CONT.
NUWC	WR	10/93	N/A	N/A	2,529	1,070	1,113	432	CONT.	CONT.
Other	Var	Var	Var	Var	1,846	900	930	336	CONT.	CONT.
Test and Evaluation										
Other	Var	Var	Var	Var	2,085	654	827	1,895	CONT.	CONT.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0303109N

PROJECT NUMBER: X0728

PROGRAM ELEMENT TITLE: Satellite Communications

PROJECT TITLE: EHF SATCOM Terminals

GOVERNMENT FURNISHED PROPERTY

<u>Item Description</u>	<u>Contract Method/ Fund Type Vehicle</u>	<u>Award/ Oblig Date</u>	<u>Delivery Date</u>	<u>Total FY 1996 &amp; Prior</u>	<u>FY 1997 Budget</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Product Development	NONE								
Support and Management	NONE								
Test and Evaluation	NONE								
Subtotal Product Development				23,901	9,659	11,149	12,535	CONT.	CONT.
Subtotal Support and Management				7,109	3,315	3,488	1,638	CONT.	CONT.
Subtotal Test and Evaluation				2,085	654	827	1,895	CONT.	CONT.
Total:				33,103	13,628	15,464	16,068	CONT.	CONT.

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

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0303109N

PROJECT NUMBER: X0731

PROGRAM ELEMENT TITLE: Satellite Communications

PROJECT TITLE: Fleet SATCOM

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
X0731 Fleet Satellite Communications	16,638	792	2,120	2,798	1,492	1,490	1,533	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: Fleet Satellite Communications is the principle carrier of Naval communications for Fleet operations worldwide. The project supports development of shipboard and shore based equipment operating through six communication satellite systems: Fleet Satellite (FLTSAT) Communications, Leased Satellite (LEASAT) Communications, Defense Satellite Communication System (DSCS), Ultra High Frequency (UHF) Follow-On Program (UFO), NATO Allied, and Air Force Satellite Communications (AFSATCOM). The principal mission is to provide global, continuous, secure communications between U.S. and Allied Forces via UHF and DSCS satellites and to provide secure anti-jam communications between joint command centers and Fleet commanders using DSCS satellites and Extremely High Frequency (EHF) capable satellites. A secondary mission is to provide rapid transfer of administrative and logistics messages over commercial and military satellites.

(U) Specifically, the efforts of this program develop UHF and Super High Frequency (SHF) communications, network controllers, time division multiplexers, and tactical applications. The FLTSAT/LEASAT/UFO Communications Systems provide Fleet broadcast service to all Navy Ships, Over-the-Horizon Targeting data for TOMAHAWK and Flag configured ships, submarine communications intelligence data, and various other battle group and joint task force communications services.

(U) The Miniature Demand Assigned Multiple Access (Mini-DAMA (M-D) AN/USC-42(V)) system will provide a similar satellite channel utilization efficiency for aircraft and submarines that are now enjoyed by surface ship and shore stations equipped with the larger TD-1271 DAMA Multiplexer and AN/WSC-3. M-D, however, provides greater capacity (8 half duplex networks) vice 4 provided by TD-1271s. M-D will also embed many encryption and data transfer functions which currently require separate equipment. M-D is being developed in two variants: the (V)1 is the submarine ship/shore application and the (V)3 is the airborne version.

(U) Closely aligned with the fielding of M-D is the transition of DAMA operations from the Distributed Control (DC) mode to the Automatic Control (AC) mode. Originally identified as "Auto-DAMA," the control system for the AC mode will provide for dynamic assignment of DAMA slots and will result in an estimated four-fold increase in satellite channel utilization efficiency. Auto-DAMA has become a joint interest program referred to as the Joint (UHF) MILSATCOM Network Integrated (JMINI) control system which will be included as part of Automated Digital Network System (ADNS). The DAMA Semi-Automatic Control (SAC) program is a stepping stone in this process and will provide an estimated two-fold utilization increase; DAMA SAC controllers will be installed during FY 96 - FY 97 with cutover to AC mode in FY 97. JMINI control system is targeted for fielding in FY 00.

(U) The Tactical Intelligence Information Exchange Subsystem (TACINTEL II+) implements the Integrated Special Intelligence Communications portion of the Copernicus and ADNS architecture, to provide services for transfer of Special Intelligence (SI) information between ships, aircraft, and shore activities in support of joint and combined operations. TACINTEL II+ will support real time indications

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

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0303109N

PROJECT NUMBER: X0731

PROGRAM ELEMENT TITLE: Satellite Communications

PROJECT TITLE: Fleet SATCOM

and warning support to joint and component commanders through reliable high speed transfer of sensor data and intelligence information. Enhanced interoperability with other services, agencies, and allies will permit a level of integration of SI operations not achievable with current systems.

(U) The SHF terminals operate within the DSCS. SHF provides high capacity, two way communications for principle Navy ship types and provides Navy connectivity to Allied and Joint Force Command Networks via the DSCS. The Universal Modem is a joint U.S./U.K. development to provide U.S. force and Allied interoperability and anti-jam, protected communications for command and control networks.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 PLAN:

- (U) (\$ 1,089) Completed OPEVAL for TACINTEL II Build 1 software.
- (U) (\$ 983) Achieved Milestone III (MS III) for TACINTEL II Build 1.
- (U) (\$ 996) Initiated Phase II Build 2 development of INTELNET.
- (U) (\$ 988) Completed testing of Mini-DAMA (V)3 (DT/OT II) systems.
- (U) (\$10,369) Obtained MS 0/I/II decision. Complete Phase I Build 1 of JMINI software and associated functions. Commence development of Phase II Build 2 JMINI software.
- (U) (\$ 376) Commenced software development and test and evaluation of ADNS implementation.
- (U) (\$ 731) Completed Mini-DAMA SSA IV&V.
- (U) (\$ 554) Conducted SHF SATCOM interoperability and certification tests with evolving joint MILSATCOM architecture.
- (U) (\$ 552) Developed and update Naval Command, Control, Communications, Computers, Intelligence, Sensors and Reconnaissance (C4ISR) implementation guidance.

2. (U) FY 1998 PLAN:

- (U) (\$ 779) Implementation of advanced Special Intelligence (SI) TACINTEL II into Automated Digital Network System (ADNS) and an additional \$979K is forward financed with FY 97 funding due to low expenditures in FY 96.

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

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0303109N

PROJECT NUMBER: X0731

PROGRAM ELEMENT TITLE: Satellite Communications

PROJECT TITLE: Fleet SATCOM

- (U) (\$ 13) Develop and update Naval Command, Control, Communications, Computers, Intelligence, Sensors and Reconnaissance (C4ISR) implementation guidance.

3. (U) FY 1999 PLAN:

- (U) (\$ 2,120) Continue implementation of TACINTEL II into ADNS.

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	19,020	849	2,247
(U) Appropriated Value			
(U) Adjustments from FY 1998 PRESBUDG:	-2,382	-57	-127
(U) FY 1999 President's Budget Submit:	16,638	792	2,120

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding:

FY 1997: Reflects \$-1,549K reprogrammed to fund other higher priority GEOSAT (X1452) programs. Other adjustments include SBIR Transfer (\$-90K), revised economic assumptions (\$-23K), NWCF adjustments (\$-400K) and other minor Navy adjustments (\$-320K). {total: \$-2,382K}

FY 1998: Reflects Congressional Undistributed general reductions (\$-57K).

FY 1999: Reflects redirection to develop and update overarching C4ISR mission requirements (\$-36K), NWCF adjustment (\$-64K), and Congressional Undistributed general reductions (\$-27K). {total: \$-127K}

(U) Schedule: Not Applicable.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7                      PROGRAM ELEMENT: 0303109N                      PROJECT NUMBER: X0731  
    PROGRAM ELEMENT TITLE: Satellite Communications                      PROJECT TITLE: Fleet SATCOM

(U) Technical: Use of existing TD-1271/WSC-5 DAMA hardware and optimize use of previously planned Air Force 5-kHz DAMA controller installations at the NCTAMS.

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

	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
OPN SHIP* 321000	32,144	21,289	31,004	36,560	41,235	69,533	68,890	CONT.	CONT.
OPN SHORE* 322000	3,604	2,376	54,251	28,141	4,175	1,258	576	CONT.	CONT.

\*Includes terminal installation costs.

(U) RELATED RDT&E:

- (U) PE 0303142A, Satellite Communications Ground Environment
- (U) PE 0204163N, Communications Automation
- (U) PE NSA 0301055, Project Embroidery

D. (U) SCHEDULE PROFILE:

Program	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
Milestones	TAC II+ 1 MS III 8/97 M-D(V)1 IOC 3/97 M-D(V)3 IOC 6/97	TAC II+ 2 MS III 7/98	
Engineering Milestones	TAC II+ 2 PCA 7/97		
T&E Milestones	TAC II+ 1 DT 11/96 TAC II+ 1 OT 3/97 M-D(V)3 DT/OTII 5/97		
Contract Milestones			

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0303109N

PROJECT NUMBER: X0731

PROGRAM ELEMENT TITLE: Satellite Communications

PROJECT TITLE: Fleet SATCOM

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

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Project Management	360	50	218
b. Systems Engineering	3,041	618	1,633
c. Prime Mission Equipment	7,871	0	0
d. System Test & Evaluation	3,573	0	0
e. Integrated Logistics Support	1,793	124	269
f. Site/Platform Integration	0	0	0
Total:	16,638	792	2,120

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Budget Item Justification  
(Exhibit R-3, Page 16 of 18)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0303109N

PROJECT NUMBER: X0731

PROGRAM ELEMENT TITLE: Satellite Communications

PROJECT TITLE: Fleet SATCOM

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

<u>Contractor/ Government Performing Activity</u>	<u>Contract Method/ Fund Type Vehicle</u>	<u>Award/ Oblig Date</u>	<u>Perform Activity EAC</u>	<u>Project Office EAC</u>	<u>Total FY 1996 &amp; Prior</u>	<u>FY 1997 Budget</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Product Development										
Titan	FPI	07/89	N/A	N/A	6,309	6,576	0	0	CONT.	CONT.
SRC	FFP	10/94	6,305	6,305	11,929	0	0	0	CONT.	CONT.
NAVSUP/SRC	PD	10/94	N/A	N/A	3,192	562	192	650	CONT.	CONT.
Other	Var	Var			6,203	3,025	426	983	CONT.	CONT.
Support and Management										
CSC	CPFF	Var	N/A	N/A	2,957	631	0	0	CONT.	CONT.
NAVAIR/ISC	PD	Var	N/A	N/A	1,176	0	124	269	CONT.	CONT.
Other	Var	Var	N/A	N/A	4,979	4,364	50	218	CONT.	CONT.
Test and Evaluation										
Other	Var	Var	N/A	N/A	7,816	1,480	0	0	CONT.	CONT.

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Budget Item Justification  
(Exhibit R-3, Page 17 of 18)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0303109N

PROJECT NUMBER: X0731

PROGRAM ELEMENT TITLE: Satellite Communications

PROJECT TITLE: Fleet SATCOM

GOVERNMENT FURNISHED PROPERTY

<u>Item Description</u>	<u>Contract Method/ Fund Type Vehicle</u>	<u>Award/ Oblig Date</u>	<u>Delivery Date</u>	<u>Total FY 1996 &amp; Prior</u>	<u>FY 1997 Budget</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Product Development									
Support and Management									
Test and Evaluation									
Subtotal Product Development				27,633	10,163	618	1,633	CONT.	CONT.
Subtotal Support and Management				9,112	4,995	174	487	CONT.	CONT.
Subtotal Test and Evaluation				7,816	1,480	0	0	CONT.	CONT.
Total:				44,561	16,638	792	2,120	CONT.	CONT.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0303140N  
PROGRAM ELEMENT TITLE: Information Systems Security Program

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
X0734 Information Systems Security	22,388	16,773	22,201	24,578	24,814	24,340	23,961	CONT.	CONT.
TOTAL	22,388	16,773	22,201	24,578	24,814	24,340	23,961	CONT.	CONT.

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The goal of the Navy Information Systems Security (INFOSEC) Program is to ensure the continued protection of Navy and Joint communications and computing systems from hostile exploitation in order to provide Information Assurance (IA) for Navy strategic and tactical systems. With the advent of the information age, the network environment, and the proliferation of distributed systems, the Navy is making profound changes in the way it has traditionally approached communications and computer security. The current operating environment has virtually eliminated the traditional distinction between telecommunications and information systems. Contributing factors to the new systems-oriented approach to security are: the development of more complex systems; the networking of systems; and rapid technological advances. The RDT&E program accomplishes this systems-oriented approach by: developing a technical strategy and framework to guide and integrate Navy efforts with DOD and NSA efforts; evaluating and tailoring standards, processes, and tools for Navy application; assessing available technology and products; developing missing technology and integrating the available technology with the newly developed technology into prototype products and systems; providing INFOSEC expertise and engineering/certification support to Department of the Navy (DON) development programs; developing standard INFOSEC products and systems to meet DON and, by agreement, Joint requirements. Because INFOSEC is a cradle-to-grave discipline, this program develops the technology and methodology to protect the confidentiality, integrity, and availability of systems in development, production and operation. It also develops the infra-structure needed to support and evaluate the security of deployed systems. These objectives are pursued for equipments/systems focusing on cryptographic technology and its use and impact on secure systems. Another focus is on providing security for tactical and non-tactical computer-based systems with emphasis on

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Budget Item Justification  
(Exhibit R-2, Page 1 of 13 Pages)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0303140N  
PROGRAM ELEMENT TITLE: Information Systems Security Program

multilevel security and the use and impact of trusted computer technology (both hardware and software) on the security of systems.

The COMSEC and COMPUSEC Projects were funded separately through FY-94. With today's proliferation of information processing networks, and the need to take a systems view of these network security requirements, the COMSEC and COMPUSEC projects were combined under the Information Systems Security Project starting in FY95.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it encompasses engineering and manufacturing development for upgrade of existing, operational systems.

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Budget Item Justification  
(Exhibit R-2, Page 2 of 13 Pages)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0303140N      PROJECT NUMBER: X0734  
PROGRAM ELEMENT TITLE: Information Systems Security      PROJECT TITLE: Information Systems Security (INFOSEC)  
Program

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
X0734 Information Systems Security	22,388	16,773	22,201	24,578	24,814	24,340	23,961	CONT.	CONT.
Current Funding Available	22,388								

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The INFOSEC project analyzes existing COMSEC/COMPUSEC equipments and develops improved, interoperable communications security equipment and methods to protect classified communications from exploitation and provide Information Assurance (IA) for critical Navy systems. The project is a continuing effort to modernize obsolete cryptographic equipment and ancillaries with state-of-the-art replacements in order to meet the evolving threat. Replacement COMSEC, in most cases, will be implemented using embedded modules (using National Security Agency (NSA) approved crypto engines). The technical strategy and framework efforts are focused on the use of COMSEC technology to counter a wide variety of INFOSEC threats in a Navy environment. Processes and tools are being developed and tested to design and evaluate the security of systems that integrate COMSEC products. Technology base efforts are: developing new secure voice prototypes; developing technology for a new family of programmable COMSEC modules (Programmable Embeddable INFOSEC Product (PEIP)); and assessing a variety of potentially high pay-off NSA and industry products. The resulting expertise is applied to a wide variety of Navy development programs that must integrate COMSEC technology. The expertise is also applied to the development of Navy INFOSEC products and systems. Under the Navy Key Management System (NKMS) program, the Navy COMSEC program will revolutionize the Navy's COMSEC Material Control System. The overall objectives of the NKMS are to: (1) increase security for all on-line and off-line information processing systems and (2) eliminate workload associated with cryptographic key management. The NKMS program provides for the electronic distribution of cryptographic keying material and includes the development of the NKMS and supporting efforts for benign key fill with the eventual goal of end-to-end encrypted key to eliminate the Walker-Whitworth type insider threat. The NKMS Program will satisfy the Joint Key Management System (JKMS) requirements. Another specific product under development is the Embeddable INFOSEC Product (EIP), designed to

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0303140N      PROJECT NUMBER: X0734  
PROGRAM ELEMENT TITLE: Information Systems Security      PROJECT TITLE: Information Systems  
Program      Security (INFOSEC)

meet the In-line Network Encryption (INE) requirements for Navy networked systems. Starting in FY95, this project also included those efforts previously funded under X0911 (Computer Security) for a total Information Systems Security approach. These efforts are focused on the integration of computer processes into DON systems and their impact on systems security. The objectives are similar to those described above for COMSEC and equally applicable to secure computer technology (i.e., threat assessment, development of missing technology (i.e., Multilevel Security (MLS) and certification methods), development of standards, processes and tools, etc). Specific emphasis is being placed on evaluation, integration and test of Contractor off-the-shelf (COTS)/Non-developmental Item (NDI) network security products into prototype capabilities such as firewalls, guards and monitoring systems to provide for monitoring, detecting, isolating and reacting (MDIR) to network intrusions throughout the DON.

## (U) PROGRAM ACCOMPLISHMENTS AND PLANS:

### 1. (U) FY 1997 PLAN:

- (U) (\$1,274) Continued development of the EIP.
- (U) (\$800) Continued development of PEIP prototype.
- (U) (\$10,248) Continued development of NKMS Tier 1 Phase 1.
- (U) (\$861) Continued development of NKMS Tier 2 and 3 components.
- (U) (\$3,394) Provided systems security engineering, certification, and accreditation support to Navy information systems such as DMS and MISSI. This included systems security engineering support to Navy tactical and non-tactical systems, that were required to incorporate DMS and MISSI evolving technology. Particular emphasis was directed to systems engineering associated with implementation of DMS and MISSI technology into tactical systems, including those associated with Top Secret and SCI systems.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0303140N      PROJECT NUMBER: X0734  
PROGRAM ELEMENT TITLE: Information Systems Security      PROJECT TITLE: Information Systems  
Program      Security (INFOSEC)

- (U) (\$1,684) Developed and tested network security solutions using available COTS/NDI and government off-the-shelf (GOTS) products to provide integrated capabilities for Navy information systems such as MISSI. This included high assurance components associated with Top Secret and SCI system solutions
- (U) (\$1,105) Continued development of integrated security architectures for Naval INFOSEC systems, both for C4I systems and non-C4I systems. This included refinements of interim, incremental security architectures that display how MISSI, EKMS, and STE security technology will be integrated into Navy systems. The architectures included analysis of all technical issues and related concepts of operations associated with the architectures. Developed requirements for mid-term INFOSEC products that were required. Continued to analyze achieved INFOSEC performance in operational systems. Included latest operational requirements, technical opportunities and new threat information.
- (U) (\$503) Continued to participate in revising/refining INFOSEC standards to reflect evolving capabilities. Refined INFOSEC engineering guideline documents as directed by the CNO/Marine Corps co-chaired Navy INFOSEC Steering Group. In coordination with NSA, continued refinements to Systems Engineering Automated Tools and other automated tools to accomplish systems certification and accreditation.
- (U) (\$1,548) Continued to support secure voice and biometric access consortia. Continued laboratory assessments of the latest NSA and industry INFOSEC technology and demonstrations of prototype voice systems. Continued research into new INFOSEC voice technology.
- (U) (\$971) Developed and updated Naval Command, Control, Communications, Computer, Intelligence, Sensors and Reconnaissance (C4ISR) implementation guidance. Developed and updated Naval C4ISR mission to incorporate an overarching operational systems, technical and information architectures. Conducted C4ISR analysis and studies.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7      PROGRAM ELEMENT:      0303140N      PROJECT NUMBER: X0734  
PROGRAM ELEMENT TITLE: Information Systems Security      PROJECT TITLE: Information Systems  
Program      Security (INFOSEC)

## 2. (U) FY 1998 PLAN:

- (U) (\$300) Complete development of the EIP.
- (U) (\$250) Continue development of PEIP prototype.
- (U) (\$8,044) Perform development demonstrations, software design reviews, and development, integration and system testing for Tier 1 Phase 1.
- (U) (\$1,185) Continue development and begin testing of Tiers 2 and 3 components.
- (U) (\$1,920) Provide systems security engineering, certification, and accreditation support to Navy information systems such as DMS and MISSI. This will include systems security engineering support to Navy tactical and non-tactical systems, that are required to incorporate DMS and MISSI evolving technology. Particular emphasis will be directed to systems engineering associated with implementation of DMS and MISSI technology into tactical systems, including those associated with Top Secret and SCI systems.
- (U) (\$1,093) Develop and test network security solutions for Navy information systems. This will include the high assurance components associated with Top Secret and SCI system solutions.
- (U) (\$1,296) Continue development of integrated security architectures for Naval INFOSEC systems, both for C4I systems and non-C4I systems. This will include refinements of interim, incremental security architectures that display how MISSI, EKMS, and STE security technology will be integrated into Navy systems. The architectures will include analysis of all technical issues and related concepts of operations associated with the architectures. Develop requirements for mid-term INFOSEC products that may be required. Continue to analyze achieved INFOSEC performance in operational systems. Include latest operational requirements, technical opportunities and new threat information.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0303140N      PROJECT NUMBER: X0734  
PROGRAM ELEMENT TITLE: Information Systems Security      PROJECT TITLE: Information Systems Security (INFOSEC)  
Program

- (U) (\$405) Continue to participate in revising/refining INFOSEC standards to reflect evolving capabilities. Refine INFOSEC engineering guideline documents as directed by the CNO/Marine Corps co-chaired INFOSEC Steering Group. In coordination with NSA, continue refinements to automated tools to accomplish systems certification and accreditation.
  - (U) (\$932) Develop secure voice integrated shipboard architecture incorporating NSA STE products and integrating COTS assessments of the latest NSA and industry INFOSEC technology and demonstrations of prototype voice systems. Continue research into new INFOSEC voice technology.
  - (U) (\$386) Develop and update Naval C4ISR implementation guidance. Develop and update Naval C4ISR mission to incorporate an overarching systems, technical and information architectures. Conduct associated C4ISR analysis and studies.
  - (U) (\$962) Reflects realignment of Navy Vulnerability Assessment and Countermeasures (NVACM) under the INFOSEC Program. Continue vulnerability assessments and information warfare threat assessments in support of critical developing information systems. Continue development, evaluation, integration and prototype of COTS/NDI network countermeasures capabilities to monitor, detect, isolate and react (MDIR) to unwanted intrusions into Navy information systems.
3. (U) FY 1999 PLAN:
- (U) (\$2,110) Continue development of PEIP prototype and begin integration and system testing.
  - (U) (\$1,249) Complete development of EKMS Tier 1 phase I.
  - (U) (\$1,998) Complete development, integration and testing of Tiers 2 and 3 components with Tier 1 system.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0303140N      PROJECT NUMBER: X0734  
PROGRAM ELEMENT TITLE: Information Systems Security      PROJECT TITLE: Information Systems  
Program      Security (INFOSEC)

- (U) (\$5,703) Begin development of Tier 1 Phase 2, incorporating Defense Message System (DMS), MISSI, Global.
- (U) (\$4,477) Provide systems security engineering, certification, and accreditation support to Navy information systems such as DMS and MISSI. This will include systems security engineering support to Navy tactical and non-tactical systems that are required to incorporate DMS and MISSI evolving technology. Attention will be directed to systems engineering associated with implementation of DMS and MISSI technology into tactical systems, including those associated with Top Secret and SCI systems.
- (U) (\$1,526) Continue developing and testing network security solutions for Navy information systems. This will include the high assurance components associated with Top Secret and SCI system solutions.
- (U) (\$1,046) Continue development of integrated security architectures for Naval INFOSEC systems, both for C4I systems and non-C4I systems. Continue development of requirements for mid-term INFOSEC products and analysis of achieved INFOSEC performance in operational systems.
- (U) (\$498) Continue revising/refining INFOSEC standards, engineering guideline documents and automated tools.
- (U) (\$2,262) Continue development of secure voice integrated shipboard architecture. Continue research into new INFOSEC voice technology and conduct laboratory assessments of the latest NSA and industry INFOSEC technology and demonstrations of prototype voice systems.
- (U) (\$1,332) Continue vulnerability/threat assessments and development and systems integration of network countermeasures tools (NVACM) efforts.

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0303140N      PROJECT NUMBER: X0734  
PROGRAM ELEMENT TITLE: Information Systems Security      PROJECT TITLE: Information Systems Security (INFOSEC)  
Program

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	25,525	20,291	25,301
(U) Adjustments from FY98 PRESBUDG:	- 3,137	- 3,518	-3,100
(U) FY 1999 President's Budget Submission:	22,388	16,773	22,201

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding:

(U) FY 1997: -\$379K transfer for SBIR assessment; -\$200K FFRDC respread; -\$1,988K reduction to finance other higher priority programs; -\$32K supplemental revised economic assumption and -\$538K for NWCF rate adjustment

(U) FY 1998: -\$79K FFRDC respread; -\$557K for Congressional undistributed general reductions; -\$45K supplemental revised economic assumption; -\$2,500K reduction for Navy / OSD offsets; and -\$337K CAAS adjustments

(U) FY 1999: -\$405K which was redirected to develop and update overarching C4ISR mission requirements; -\$1,785K for low prior years expenditures ; -\$299K for NWCF rate adjustment; -\$218K misc adjustments; and -\$393K for inflation adjustment.

(U) Schedule: Not Applicable

(U) Technical: Not Applicable

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DATE: February 1998

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0303140N      PROJECT NUMBER: X0734  
PROGRAM ELEMENT TITLE: Information Systems Security Program      PROJECT TITLE: Information Systems Security (INFOSEC)

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

	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
(U) OPN 3415 Information Systems Security Program (ISSP)	37,294	33,179	48,990	93,700	88,424	84,171	69,272	CONT.	CONT.
(U) O&MN 4A6M	15,343	15,641	14,966	15,305	15,771	16,071	16,453	CONT.	CONT.
(U) RELATED RDT&E: (U) PE 0303140G (Cryptographic Equipments)									



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BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0303140N      PROJECT NUMBER: X0734  
PROGRAM ELEMENT TITLE: Information Systems Security Program      PROJECT TITLE: Information Systems Security (INFOSEC)

## D. SCHEDULE PROFILE:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
EKMS			
Program Milestones			
Engineering Milestones	1Q-SSR	1Q-Build Rev 3	
	3Q-Build Review 1	4Q-IOC	
	4Q-Build Rev 2		
T&E Milestones			3Q-In plant test
			4Q-GAT
Contract Milestones			
EIP			
Program Milestones			
Engineering Milestones			
T&E Milestones		1/2Q-CONTR TEST	
Contract Milestones		3Q-EMDM Cert/ Delivery	

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7	PROGRAM ELEMENT: 0303140N	PROJECT NUMBER: X0734	
	PROGRAM ELEMENT TITLE: Information Systems Security Program	PROJECT TITLE: Information Systems Security (INFOSEC)	

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

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Security Science & Technology	3,301	2,112	3,197
b. System Security Engineering	5,421	5,857	6,324
c. Security Guidance & Assessments	805	1,514	2,372
d. INFOSEC Products & Subsystems	12,861	7,290	10,308
Current Allocation	22,388	16,773	22,201

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

PERFORMING ORGANIZATIONS

<u>Contractor/ Government Performing Activity</u>	<u>Contract Method/ Fund Type Vehicle</u>	<u>Award/ Oblig Date</u>	<u>Perform Activity EAC</u>	<u>Project Office EAC</u>	<u>Total FY 1996 &amp; Prior</u>	<u>FY 1997 Budget</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Product Development										
VIASAT	CPFF	9/93	7,582	7,582	6,582	700	300	0	0	7,582

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7	PROGRAM ELEMENT: 0303140N	PROJECT NUMBER: X0734
	PROGRAM ELEMENT TITLE: Information Systems Security Program	PROJECT TITLE: Information Systems Security (INFOSEC)

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
SAIC	CPAF	8/95	25,258	25,258	8,858	8,525	6,975	900	0	25,258
Various Support and Management	Various	Various	Various	Various	13,348	10,187	7,024	18,182	CONT.	CONT.
Support and Management (con't)										
Various	Various	Various	Various	Various	3,212	2,976	2,474	3,119	CONT.	CONT.
Test and Evaluation			Not applicable							
GOVERNMENT FURNISHED PROPERTY			Not Applicable							
Subtotal Product Development					18,771	19,412	14,299	19,082	CONT.	CONT.
Subtotal Support and Management					3,212	2,976	2,474	3,119	CONT.	CONT.
Subtotal Test and Evaluation										
Current Available					21,983	22,388	16,773	22,201	CONT.	CONT.

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FY 1998 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0303150N

PROGRAM ELEMENT TITLE: Global Command and Control System

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 COMPLETE	TO PROGRAM	TOTAL
X2304 Global Command and Control System (GCCS)	0	484	469	505	515	526	537	CONT.	CONT.
TOTAL	0	484	469	505	515	526	537	CONT.	CONT.

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Global Command and Control System (GCCS) (formerly Worldwide Military Command and Control System (WWMCCS)) is an operational, strategic joint/multi-service program that provides support to the National Command Authority (NCA) and the Joint Staff by providing C3 data processing capabilities that facilitate national security decision making, force preparation, and operations planning and execution. GCCS replaced WWMCCS and extends the strategic C3 capabilities to the tactical user level, as well as providing all sites with enhanced tactical capabilities that did not exist in WWMCCS.

The Defense Information Systems Agency (DISA) is the lead agency for GCCS, however, each Service is responsible for designing and developing essential service unique components in support of Navy GCCS users. Each component must be created to ensure interoperability, backward compatibility, and effective interface with all core components.

Operationally, the Navy supported sites are USACOM, USPACOM, CINCLANTFLT, CINCPACFLT, CINCUSNAVEUR, CNO, and COMUSJAPAN, as well as associated remote and afloat GCCS users. Additional GCCS server/user sites include COMNAVCENT, NAVSPECWARCOM, and NAVSPACECOM.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it encompasses engineering and manufacturing development for upgrade of existing, operational systems.

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Budget Item Justification

(Exhibit R-2, Page 1 of 4)

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FY 1998 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0303150N

PROGRAM ELEMENT TITLE: Global Command and Control System

(U) COST (Dollars in thousands)

## PROJECT

NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TOTAL COMPLETE	PROGRAM
X2304 Global Command and Control System (GCCS)	0	484	469	505	515	526	537	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: Discussed on previous page.

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# UNCLASSIFIED

Budget Item Justification

(Exhibit R-2, Page 2 of 4)

# UNCLASSIFIED

FY 1998 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0303150N

PROJECT NUMBER: X2304

PROGRAM ELEMENT TITLE: Global Command and Control System

PROJECT TITLE: GCCS

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 PLAN:

- (U) Not Applicable.

2. (U) FY 1998 PLAN:

- (U) (\$476) Develop a Web based interface to the GCCS segments which will allow the use of standard Navy hardware instead of the non-standard hardware prescribed by DISA and migrate Navy site unique GCCS applications to GCCS DII version 4.0. Efforts will include initial development and required upgrades to accommodate changes between GCCS DII COE versions 3 and 4. The Navy site unique application, Reserve Data Unit Data Resource System version 4.0 (RUDRS), will also require updating to accommodate GCCS CDII version 4.0, developing new code to support emergent user requirements and migration to Oracle database. (October 97 through July 98)
- (U) (\$8) Develop and update Naval Command, Control, Communications, Computers, Intelligence, Sensors and Reconnaissance (C4ISR) implementation guidance. Develop and update Naval C4ISR mission to incorporate an overarching operational, systems, technical and information architectures. Conduct associated C4ISR analyses and studies.

3. (U) FY 1999 PLAN:

- (U) (\$469) Continue to develop and migrate the Web based interface and migrate Navy site unique GCCS applications to GCCS DII version 5.0. Efforts will include initial development and required upgrades to Navy segments to accommodate changes between GCCS DII COE versions 4 and 5. Develop RUDRS 5.0 and integrate with GCCS DII version 5.0. (October 98 through July 99)

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Budget Item Justification

(Exhibit R-2, Page 3 of 4)

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FY 1998 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0303150N

PROJECT NUMBER: X2304

PROGRAM ELEMENT TITLE: Global Command and Control System

PROJECT TITLE: GCCS

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY1998 PRESIDENT'S BUDGET:	0	498	508
(U) Appropriated Value			
(U) Adjustments from FY 1998 PRESBUDG:	0	-14	-39
(U) FY 1999 President's Budget Submit:	0	484	469

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY98 Congressional undistributed general reductions \$-13K; Revised Economic Assumptions \$-1K. FY99 Redirected \$-8K to develop and update overarching C4ISR mission requirements, \$-25K due to NWCf adjustment, and \$-6K for Congressional undistributed general reductions.

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

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

	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
(U) OPN 3350	2,730	1,526	2,944	3,153	3,255	5,084	3,844	CONT.	CONT.
(U) OMN	1,560	5,122	5,374	5,462	5,564	5,717	5,880	CONT.	CONT.

(U) RELATED RDT&E: Not applicable

D. (U) SCHEDULE PROFILE: Not Applicable

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# UNCLASSIFIED

Budget Item Justification

(Exhibit R-2, Page 4 of 4)

# UNCLASSIFIED

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0305160N

PROGRAM ELEMENT TITLE: Defense Meteorological Satellite

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
R0524 DMSP - Navy Support									
727		*4,389	10,432	11,977	20,696	21,957	20,788	CONT.	CONT.
X1452 GEOSAT									
16,008		364	1,239	1,762	1,758	983	969	CONT.	CONT.
TOTAL	16,735	4,753	11,671	13,739	22,454	22,940	21,747	CONT.	CONT.

\*Project transferred from X0524 in FY 1998

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This program element supports Navy interests in, and commitments to, satellite, sensor, and operational development activities associated with two national satellite programs: 1) the Joint Service Defense Meteorological Satellite Program (DMSP), and 2) the Navy Geodetic/geophysical Satellite (GEOSAT), funded entirely by Navy. The passive microwave instruments carried on DMSP provide global oceanic and atmospheric data of direct operational relevance, including sea surface wind, sea ice, precipitation; GEOSAT altimeter data are used to produce significant wave height, ocean circulation, and ocean topography. The DMSP Navy Support project provides for Navy participation in Navy/Air Force cooperative efforts leading to current and future DMSP sensor development, including calibration and validation of instruments and delivery of satellite products to the Fleet. A new initiative in 1998, Windsat, is a risk reduction effort for the DoC(NOAA)/DoD converged satellite program, National Polar-Orbiting Operational Environmental Satellite System (NPOESS). The DMSP Navy Support project supports the Navy contribution to Windsat, which is fully funded via a formalized inter-agency agreement. The GEOSAT provided ocean topography information from 1985-1990. In 1991, the Navy began the development of a follow-on capability to continue providing this required ocean topography information via the GEOSAT follow-on project, to be launched in 1998. Both of these projects fulfill Navy's obligation to develop ocean-unique technology.

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Budget Item Justification  
(Exhibit R-2, page 1 of 16)

# UNCLASSIFIED



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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0305160N

PROGRAM ELEMENT TITLE: Defense Meteorological Satellite

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it encompasses engineering and manufacturing development for upgrade of existing, operational systems.

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Budget Item Justification  
(Exhibit R-2, page 2 of 16)

# UNCLASSIFIED

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0305160N

PROGRAM ELEMENT TITLE: Defense Meteorological Satellite

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
R0524 DMSP - Navy Support	727	*4,389	10,432	11,977	20,696	21,957	20,778	Cont.	Cont.

\*Project transferred from X0524 in FY 1998.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Defense Meteorological Satellite Program (DMSP) - Navy Support project provides for Navy participation in current DMSP Special Sensor Microwave/Imager and Special Sensor Microwave Imager/Sounder ,and future Navy unique sensor development efforts Windsat in support of the Fleet operational requirements on the converged National Polar-orbiting Operational Environmental Satellite System (NPOESS). These efforts are not funded within the Air Force PE for DMSP/NPOESS, and are in accordance with current inter- agency agreements. The project also acquires the information necessary to keep Navy ground receiving equipment compatible with future satellite data formats and data transfer rates. The project also provides for studies leading to operational improvements of satellite derived products and implemented via Navy participation as a voting member of the DMSP Configuration Control Board (CCB).

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

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Budget Item Justification  
(Exhibit R-2, page 3 of 16)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0305160N PROJECT NUMBER: R0524  
PROGRAM ELEMENT TITLE: Defense Meteorological Satellite PROJECT TITLE: DMSP-Navy Support

- (U) (\$180) Continued systems engineering of Navy-unique sensor requirements for surface wind fields.
- (U) (\$119) Continued participation on the DMSP CCB.
- (U) (\$160) Continued to monitor sensor and program developments.
- (U) (\$246) Participated in convergence system studies and systems engineering trade-off evaluations for the overall operational requirements.
- (U) (\$22) Developed and updated Naval Command, Control, Communications, Computers, Intelligence, Sensors and Reconnaissance (C4ISR) implementation guidance. Developed and updated Naval C4ISR mission to incorporate an overarching operational, systems, technical and information architecture. Conducted associated C4ISR analyses and studies.

2. (U) FY 1998 PLAN:

- (U) (\$68) Participate in DMSP Special Sensor Microwave/Imager Calibration/Validation. Continue data quality assurance activities in support of operational products.
- (U) (\$924) Transfer funds to Project X1452 for support of Geosat to develop and update Naval C4ISR implementation guidance. Develop and update Naval C4ISR mission to incorporate an overarching operational, systems, technical and information architecture. Conduct associated C4ISR analyses and studies.
- (U) (\$3,397) Conduct design and analysis for Windsat and breadboard sensor and subsystems leading to a prototype instrument.

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Budget Item Justification  
(Exhibit R-2, page 4 of 16)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0305160N PROJECT NUMBER: R0524  
PROGRAM ELEMENT TITLE: Defense Meteorological Satellite PROJECT TITLE: DMSP-Navy Support

### 3. (U) FY 1999 PLAN:

- (U) (\$500) Prepare for validation effort associated with the expected launch of the first DMSP SSMIS (Microwave Imager/Sounder).
- (U) (\$1,428) Design and fabricate Airborne Polarimetric Microwave Imaging Radiometer (APMIR) to use for calibration/validation of DMSP SSM/I and SSM/IS sensors, and Windsat development, calibration, and validation.
- (U) (\$8,504) Complete Windsat sensor design and initiate fabrication of flight hardware.

### B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	771	2,789	8,745
(U) Appropriated Value:	-	822	-
(U) Adjustments from FY 1998 Presbudg:	-44	+1,600	+1,687
(U) FY 1999 President's Budget Request:	727	4,389	10,432

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Budget Item Justification  
(Exhibit R-2, page 5 of 16)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7      PROGRAM ELEMENT:                      0305160N                      PROJECT NUMBER: R0524  
PROGRAM ELEMENT TITLE: Defense Meteorological Satellite      PROJECT TITLE: DMSP-Navy Support

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1997 adjustments is due to SBIR assessment (-13), supplemental revised economic assumptions (-1), and minor program adjustment update to reflect actual execution (-30). FY 1998 adjustment is due to acceleration of DSMP development (+3,700), subsequent Congressional reduction (-1,967), Congressional Undistributed reductions (-123), and economic assumption (-10). FY 1999 adjustment is Commercial purchases inflation adjustment (-185), Navy Working Capital Fund (NWCF) surcharge correction (+143), other NWCF adjustments (-86), acceleration of DSMP development in accordance with revised MOU (+2,000) and other minor adjustments (-193), and military and civilian payraise (+8).

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

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

(U) RELATED RDT&E:

(U) PE 0305160F, Air Force DMSP

(U) PE 0604218N, Air/Ocean Equipment Engineering

D. (U) SCHEDULE PROFILE: Not applicable.

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Budget Item Justification  
(Exhibit R-2, page 6 of 16)

# UNCLASSIFIED

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

DATE: February 1998

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0305160N PROJECT NUMBER: R0524  
PROGRAM ELEMENT TITLE: Defense Meteorological Satellite PROJECT TITLE: DMSP-Navy Support

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

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Satellite Development	0	0	1,000
b. Payload Development	0	3,397	7,504
c. Science and Calibration/Validation	488	68	500
d. Airborne Testbed	0	0	1,428
e. Support GFO	242	924	0
Total	727	4,389	10,432

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RDT&E PE/Project Cost Breakdown  
(Exhibit R-3, page 7 of 16)

# UNCLASSIFIED

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

DATE: February 1998

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0305160N PROJECT NUMBER: R0524  
PROGRAM ELEMENT TITLE: Defense Meteorological Satellite PROJECT TITLE: DMSP-Navy Support

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

### PERFORMING ORGANIZATIONS

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

Various	Various		CONT.	CONT.	0	0	727	4,389	10,432	CONT.	CONT.
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Support and Management: Not Applicable

Test and Evaluation: Not Applicable

GOVERNMENT FURNISHED PROPERTY: Not Applicable

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RDT&E PE/Project Cost Breakdown  
(Exhibit R-3, page 8 of 16)

# UNCLASSIFIED

# UNCLASSIFIED

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

DATE: February 1998

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0305160N PROJECT NUMBER: R0524  
PROGRAM ELEMENT TITLE: Defense Meteorological Satellite PROJECT TITLE: DMSP-Navy Support

	<u>FY 1995</u> <u>&amp; Prior</u>	<u>FY 1996</u> <u>Budget</u>	<u>FY 1997</u> <u>Budget</u>	<u>FY 1998</u> <u>Budget</u>	<u>FY 1999</u> <u>Budget</u>	<u>To</u> <u>Complete</u>	<u>Total</u> <u>Program</u>
Subtotal Product Development	0	0	727	4,389	10,432	CONT.	CONT.
Subtotal Support and Management: Not Applicable							
Subtotal Test and Evaluation: Not Applicable							
Total Project	0	0	727	4,389	10,432	CONT.	CONT.

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RDT&E PE/Project Cost Breakdown  
(Exhibit R-3, page 9 of 16)

# UNCLASSIFIED





# UNCLASSIFIED

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7      PROGRAM ELEMENT:                    0305160N                    PROJECT NUMBER: X1452  
PROGRAM ELEMENT TITLE: Defense Meteorological Satellite      PROJECT TITLE: GEOSAT

- (U) (\$13,980) Completed GFO spacecraft and launch.

(U) (\$11) Developed and updated Naval Command, Control, Communications, Computers, Intelligence, Sensors and Reconnaissance (C4ISR) implementation guidance. Developed and updated Naval C4ISR mission to incorporate an overarching operational, systems, technical and information architecture. Conducted associated C4ISR analyses and studies.

2. (U) FY 1998 PLAN:

- (U) (\$357) Fund on-orbit performance incentive.
- (U) (\$7) Develop and update Naval C4ISR implementation guidance. Develop and update Naval C4ISR mission to incorporate an overarching operational, systems, technical and information architecture. Conduct associated C4ISR analyses and studies.

3. (U) FY 1999 PLAN:

- (U) (\$800) Fund on-orbit performance incentive.
- (U) (\$439) Continue to monitor satellite and launch operations.

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	12,362	376	390
(U) Appropriated Value:	-	376	-
(U) Adjustments from FY 1998 PRESBUDG:	+3,646	-12	+849

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RDT&E PE/Project Cost Breakdown  
(Exhibit R-3, page 11 of 16)

# UNCLASSIFIED

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0305160N PROJECT NUMBER: X1452  
PROGRAM ELEMENT TITLE: Defense Meteorological Satellite PROJECT TITLE: GEOSAT

(U) FY 1999 President's submit: 16,008 364 1,239

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1997 adjustment is due to SBIR assessment (-325), FY 1999 Supplemental revised economic assumptions (-15), and below threshold reprogramming needed for program restructure (+3,986). FY 1998 adjustment is due to Congressional Undistributed reductions (-11) and economic assumptions (-1). FY 1999 adjustment is due to DMSP support funding realignment (+870), Navy Working Capital Fund (NWCF) surcharge correction (+1), commercial purchases inflation adjustment (-22).

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

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

(U) RELATED RDT&E:

(U) PE 0604218N (Air/Ocean Equipment Engineering)

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RDT&E PE/Project Cost Breakdown  
(Exhibit R-3, page 12 of 16)

# UNCLASSIFIED

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7    PROGRAM ELEMENT:            0305160N            PROJECT NUMBER: X1452  
PROGRAM ELEMENT TITLE: Defense Meteorological Satellite    PROJECT TITLE: GEOSAT

D. (U) SCHEDULE PROFILE:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
Program Milestones	Launch Sat #1		
Engineering Milestones	FRR 3Q		
T&E Milestones	On Orbit Tests		
Contract Milestones	Not Applicable		

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RDT&E PE/Project Cost Breakdown  
(Exhibit R-3, page 13 of 16)

# UNCLASSIFIED

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7      PROGRAM ELEMENT:                    0305160N                    PROJECT NUMBER: X1452  
    PROGRAM ELEMENT TITLE: Defense Meteorological Satellite                    PROJECT TITLE: GEOSAT

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

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Satellite Development	15,680	364	1,239
b. Sensor Development	0	0	0
c. Contractor Engineering Support	328	0	0
<b>Total</b>	<b>16,008</b>	<b>364</b>	<b>1,239</b>

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

PERFORMING ORGANIZATIONS

<u>Contractor/ Government Performing Activity</u>	<u>Contract Method Fund Vehicle</u>	<u>Award/ Oblig Date</u>	<u>Perform Activity EAC</u>	<u>Project Office EAC</u>	<u>Total FY 1995 &amp; Prior</u>	<u>FY 1996 Budget</u>	<u>FY 1997 Budget</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Product Development											
Ball Aerospace w/Options	CPIF	8/92	85,868	85,868	47,068	19,387	15,689	364	1,239		
Various	Various	N/A	CONT.	CONT.	5,541	820	0	0	0	CONT.	CONT.
Support and Management: Not Applicable											

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Budget Item Justification  
(Exhibit R-3, page 14 of 16)

# UNCLASSIFIED

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7      PROGRAM ELEMENT:                      0305160N                      PROJECT NUMBER: X1452  
PROGRAM ELEMENT TITLE: Defense Meteorological Satellite      PROJECT TITLE: GEOSAT

<u>Contractor/ Government Performing Activity</u>	<u>Contract Method Fund Vehicle</u>	<u>Award/ Oblig Date</u>	<u>Perform Activity EAC</u>	<u>Project Office EAC</u>	<u>Total FY 1995 &amp; Prior</u>	<u>FY 1996 Budget</u>	<u>FY 1997 Budget</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Various					2,203	350	319	0	0	CONT.	CONT.

Test and Evaluation: Not Applicable

GOVERNMENT FURNISHED PROPERTY Not Applicable

<u>Item Description</u>	<u>Contract Method Fund Type Vehicle</u>	<u>Award/ Oblig Date</u>	<u>Delivery Date</u>	<u>Total FY 1995 &amp; Prior</u>	<u>FY 1996 Budget</u>	<u>FY 1997 Budget</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
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Product Development Not Applicable

Support and Management Not Applicable

Test and Evaluation Not Applicabale

Subtotal Product Development				52,609	20,200	15,680	364	1,329	CONT.	CONT.
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Subtotal Support and Management				2,203	350	328	0	0	CONT.	CONT.
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Subtotal Test and Evaluation Not Applicable

Total Project				54,812	20,557	16,008	364	1,239	CONT.	CONT.
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Budget Item Justification  
(Exhibit R-3, page 15 of 16)

# UNCLASSIFIED

# UNCLASSIFIED

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0305160N

PROJECT NUMBER: X1452

PROGRAM ELEMENT TITLE: Defense Meteorological Satellite

PROJECT TITLE: GEOSAT

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Budget Item Justification  
(Exhibit R-3, page 16 of 16)

# UNCLASSIFIED

# UNCLASSIFIED

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0305188N

PROGRAM ELEMENT TITLE: Joint (C4ISR) Battle Center

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
X2456 Joint (C4ISR) Battle Center	2,829*	2,808*	5,352	8,200	8,377	8,567	8,776	CONT.	CONT.
TOTAL	2,829*	2,808*	5,352	8,200	8,377	8,567	8,776	CONT.	CONT.

Note: \*Funds for this program were transferred from the Joint Staff to the Department of Navy, by the Defense Reform Initiative, beginning in FY 1999. In addition, funds for this program were previously included in the FY 1997/98 Joint Staff Budget under PE 0303149J, C4I for the Warrior.

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Joint Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR) Battle Center (JBC) is the Chairman, Joint Chiefs of Staff (CJCS) facility for warfighter exploration and assessment of C4ISR capabilities. The Center provides the combatant commands, at the Joint Task Force (JTF) level, with a joint assessment and experimental environment for the warfighter and technologist in support of Joint Vision 2010 (JV2010). It serves as the technical analysis and assessment agency for the Joint Requirement Operating Council (JROC) in determining C4ISR system "value-added" PRIOR to introduction to the CINCs and in advance of system fielding in operational environments. The intent is for the JBC to be a forcing function for joint synchronization and a means to foster rapid, near-term insertion of C4ISR technology. The mission of the JBC is to provide rapid assessment of required C4ISR interoperability and warfighter utility, join emerging C4ISR technology with new operational doctrine, and result in fielding C4ISR capabilities that meet the joint warfighter's needs. Initial attention is focused on developing the experimentation and assessment methodology for implementing Joint Vision 2010 (JV 2010).

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it provides rapid assessment of required C4ISR interoperability, as well as rapid insertion of emerging technology, with new operational doctrine that will result in fielding C4ISR capabilities that meet the joint warfighter's need.

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# UNCLASSIFIED

Budget Item Justification

(Exhibit R-2, Page 1 of 5)



# UNCLASSIFIED

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0305188N

PROJECT NUMBER: X2456

PROGRAM ELEMENT TITLE: Joint (C4ISR) Battle Center

PROJECT TITLE: Joint (C4ISR)

Battle Center

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2000 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
X2456 Joint (C4ISR) Battle Center	2,829*	2,808*	5,352	8,200	8,377	8,567	8,776	CONT.	CONT.

Note: \*Funds for this program were transferred from the Joint Staff to the Department of Navy, by the Defense Reform Initiative, beginning in FY 1999. In addition, funds for this program were previously included in the FY 1997/98 Joint Staff Budget under PE 0303149J, C4I for the Warrior.

A. (U) The Joint Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR) Battle Center (JBC) is the Chairman, Joint Chiefs of Staff (CJCS) facility for warfighter exploration and assessment of C4ISR capabilities. The Center provides the combatant commands, at the Joint Task Force (JTF) level, with a joint assessment and experimental environment for the warfighter and technologist in support of Joint Vision 2010 (JV2010). It serves as the technical analysis and assessment agency for the Joint Requirement Operating Council (JROC) in determining C4ISR system "value-added" PRIOR to introduction to the CINCs and in advance of system fielding in operational environments. The intent is for the JBC to be a forcing function for joint synchronization and a means to foster rapid, near-term insertion of C4ISR technology. The mission of the JBC is to provide rapid assessment of required C4ISR interoperability and warfighter utility, join emerging C4ISR technology with new operational doctrine, and result in fielding C4ISR capabilities that meet the joint warfighter's needs. Initial attention is focused on developing the experimentation and assessment methodology for implementing Joint Vision 2010 (JV 2010).

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 PLAN: \$0

2. (U) FY 1998 PLAN: \$0

R-1 Line Item 182

# UNCLASSIFIED

Budget Item Justification

(Exhibit R-2, Page 2 of 5)

# UNCLASSIFIED

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0305188N

PROJECT NUMBER: X2456

PROGRAM ELEMENT TITLE: Joint (C4ISR) Battle Center

PROJECT TITLE: Joint (C4ISR)

Battle Center

### 3. (U) FY 1999 PLAN:

- (U) (\$705K) Host Joint Warfighter Interoperability Demonstration (JWID). The JWID permits scenarios for warfighting commanders and acquisition decision makers which are relevant to new interoperability technology and the utility of evolving systems for operational use pertinent to each annual theme. The JBC has the infrastructure in place to support this demo.
- (U) (\$1,450K) Follow-on JWID. Upon completion and evaluation of each JWID the CINC's and CJTF's vote for participant systems for JBC to perform follow-on evaluation, assessment and demonstration on.
- (U) (\$1,100K) Asynchronous Transfer Mode (ATM) Operational Demonstration. ATM will take advantage of significant advances in switching technology to ensure CJTF seamless communications across all forces. Bandwidth restrictions severely limit successful JTF operations. ATM offers a potential solution but there is currently no DOD or Industry standard. This effort addresses a lack of standardization and a required CINC/JTF capability. Each service is currently selecting their "vendor of choice" which will likely lead to non-interoperability as well as increased cost and complexity in implementation. JBC will document/validate interoperability problems, assess ability to support tactical JTF down to actual ground forces and perform an operational demonstration.

R-1 Line Item 182

# UNCLASSIFIED

Budget Item Justification

(Exhibit R-2, Page 3 of 5)

# UNCLASSIFIED

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0305188N

PROJECT NUMBER: X2456

PROGRAM ELEMENT TITLE: Joint (C4ISR) Battle Center

PROJECT TITLE: Joint (C4ISR)  
Battle Center

- (U) (\$1,202K) Link 16 Operational Demonstration. Demonstrate Link-16/VMF Digitized Battle Space interoperability for the purpose of software development to permit portable exchange of tactical information to/from Link-16 and VMF networks. This is an advanced concept technology demonstration (ACTD).
- (U) (\$895K) Federated Battle Lab (FBL). The FBL is a consortium of Joint and Service battle centers/laboratories formed to promote solutions to operational problems in CJTF environments. The JBC is recognized as the joint FBL hub by CINC's and CJTF's

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY1998 PRESIDENT'S BUDGET:	*	*	0
(U) Appropriated Value			
(U) Adjustments from FY 1998 PRESBUDG:	*	*	+5,352
(U) FY 1999 President's Budget Submit:	*	*	5,352

Note: \*Funds for this program were transferred from the Joint Staff to the Department of Navy, IAW the Defense Reform Initiative beginning in FY99. In addition, funds for this program were previously included in PE 0303149J-C4I for the Warrior.

(U) CHANGE SUMMARY EXPLANATION:

- (U) Funding: Transferred from Joint Staff, RDT&E,DW BA-7 IAW the Defense Reform Initiative
- (U) Schedule: Not applicable.
- (U) Technical: Not applicable.

R-1 Line Item 182

# UNCLASSIFIED

Budget Item Justification

(Exhibit R-2, Page 4 of 5)

# UNCLASSIFIED

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0305188N

PROJECT NUMBER: X2456

PROGRAM ELEMENT TITLE: Joint (C4ISR) Battle Center

PROJECT TITLE: Joint (C4ISR)  
Battle Center

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

	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
(U) OPN 3368	4,814*	2,834*	2,677	0	0	0	0	TBD	TBD
(U) OMN 1C6C	11,657*	11,134*	10,071	12,456	12,730	13,009	13,296	CONT.	CONT.

Note: \*Funds for this program were transferred from DISA to the Joint Staff in FY 97. Funds were further transferred from the Joint Staff to the Department of Navy, IAW Defense Reform Initiative, beginning in FY99. In addition, funds for this program were previously included in PE 0303149J-C4I for the Warrior.

(U) RELATED RDT&E: Not applicable

D. (U) SCHEDULE PROFILE:

	<u>FY1997</u>	<u>FY1998</u>	<u>FY1999</u>
Host/Follow-on JWID	X		X
Federated Battle Lab	X	X	X
ATM Assessment Report		X	
ATM Operational Demo			X
Link 16 Assessment Plans		X	
Link 16 Assessment Report		X	
Link 16 Operational Demo			X

R-1 Line Item 182

# UNCLASSIFIED

Budget Item Justification

(Exhibit R-2, Page 5 of 5)

# UNCLASSIFIED

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0305927N

PROGRAM ELEMENT TITLE: Naval Space Surveillance

(U) COST: (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
R0125 Naval Space Surveillance	659	387	399	722	735	749	762	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Naval Space Surveillance Fence is an integral component of the U. S. Space Command Space Surveillance Network. This system provides continuous surveillance and unalerted detection of space objects crossing the Continental United States (CONUS). The fence is also the only space surveillance system which provides satellite vulnerability and space control data to the fleet units. It is a multistatic continuous wave radar fence consisting of three transmitter sites, six receiver sites, and a computation/communication center. The transmitter and receiver sites are located on a great circle across the southern CONUS, and the computation/communication center is located at Naval Space Command.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it encompasses engineering and manufacturing development for upgrade of existing operational systems.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) (\$121) Completed development of integrated and optical fence sensors.

R-1 Line Item 185

Budget Item Justification  
(Exhibit R-2, page 1 of 6)

# UNCLASSIFIED

# UNCLASSIFIED

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0305927N

PROJECT NUMBER: R0125

PROGRAM ELEMENT TITLE: Naval Space Surveillance

PROJECT TITLE: Naval Space Surveillance

- (U) (\$182) Prototyped high risk components of next generation fence.
  - (U) (\$150) Initiated development of prototype transmitter module.
  - (U) (\$206) Improved accuracy and consistency of angular resolution and chirp processing techniques.
2. (U) FY 1998 PLAN:
- (U) (\$181) Evaluate site distribution impacts to current system of X-band implementation.
  - (U) (\$206) Improved accuracy and consistency of chirp processing techniques.
3. (U) FY 1999 PLAN:
- (U) (\$200) Develop and evaluate prototype X band feed assembly as part of antenna array.
  - (U) (\$100) Evaluate impacts to current system of X band implementation.
  - (U) (\$99) Demonstrate impact of high volume processing (10-100 times) on multiple site integration.

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	677	399	529
(U) Appropriated Value:	-	399	-
(U) Adjustments from FY 1998 PRESBUDG:	-18	-12	-130
(U) FY 1999 President's Budget Request:	659	387	399

R-1 Line Item 185

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

# UNCLASSIFIED

# UNCLASSIFIED

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0305927N

PROJECT NUMBER: R0125

PROGRAM ELEMENT TITLE: Naval Space Surveillance

PROJECT TITLE: Naval Space Surveillance

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1997 adjustment is due to SBIR assessment (-18), revised economic assumptions (-1) and update to reflect actual execution (+1). FY 1998 adjustment is due to Congressional Undistributed reductions (-11) and economic assumptions (-1). FY 1999 adjustment is due to Navy Working Capital Fund surcharge correction (+3), other NWCF adjustments (-1), a reduction due to unjustified level of effort program growth (-125) and an inflation adjustment (-7).

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

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

(U) RELATED RDT&E: Not applicable.

D. (U) SCHEDULE PROFILE: Not applicable.

R-1 Line Item 185

Budget Item Justification  
(Exhibit R-2, page 3 of 6)

# UNCLASSIFIED

# UNCLASSIFIED

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

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0305927N

PROJECT NUMBER: R0125

PROGRAM ELEMENT TITLE: Naval Space Surveillance

PROJECT TITLE: Naval Space Surveillance

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

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Project Management	20	12	15
b. Product Development	639	375	384
Total	659	387	399

R-1 Line Item 185

RDT&E PE/Project Cost Breakdown  
(Exhibit R-3, page 4 of 6)

# UNCLASSIFIED



# UNCLASSIFIED

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

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0305927N

PROJECT NUMBER: R0125

PROGRAM ELEMENT TITLE: Naval Space Surveillance

PROJECT TITLE: Naval Space Surveillance

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

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

Miscellaneous					UNK	659	387	399	CONT.	CONT.
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Support and Management: Not applicable.

Test and Evaluation: Not applicable.

GOVERNMENT FURNISHED PROPERTY: Not applicable.

R-1 Line Item 185

RDT&E PE/Project Cost Breakdown  
(Exhibit R-3, page 5 of 6)

# UNCLASSIFIED

# UNCLASSIFIED

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

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0305927N

PROJECT NUMBER: R0125

PROGRAM ELEMENT TITLE: Naval Space Surveillance

PROJECT TITLE: Naval Space Surveillance

	<u>Total FY 1996 &amp; Prior</u>	<u>FY 1997 Budget</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Subtotal Product Development	UNK	659	387	399	CONT.	CONT.
Subtotal Support and Management	0	0	0	0	0	0
Subtotal Test and Evaluation	0	0	0	0	0	0
Total Project	UNK	659	387	399	CONT.	CONT.

R-1 Line Item 185

RDT&E PE/Project Cost Breakdown  
(Exhibit R-3, page 6 of 6)

# UNCLASSIFIED

**UNCLASSIFIED**

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0604227N

PROGRAM ELEMENT TITLE: Harpoon Modifications

A. (U) COST: (Dollars in Thousands)

PROJECT NUMBER TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
W1843 Harpoon	0	0	1,965	1,958	977	0	0	0	4,900
TOTAL	0	0	1,965	1,958	977	0	0	0	4,900

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

(U) HARPOON MODIFICATIONS Description: The Harpoon Block II Weapon System program will upgrade and expand the capabilities of the U. S. Navy's only anti-ship missile to improve its precision in congested littoral environments. It provides an intermediate range, day/night, all weather, weapon for use against surface ship targets in both open ocean and littoral environments. Harpoon Block II reuses hardware and software from Harpoon Block 1G, Stand-Off Land Attack Missile Expanded Response (SLAM ER), and Joint Direct Attack Missile (JDAM) to provide Global Positioning System (GPS) accuracy for the Harpoon Weapon System, and improve Anti Surface Warfare (ASUW) performance in the littoral environments.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it encompasses engineering and manufacturing development for upgrade of existing, operational systems.

Exhibit R-2

**UNCLASSIFIED**

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0604227N

PROGRAM ELEMENT TITLE: Harpoon Modifications

PROJECT NUMBER: W1843

PROJECT TITLE: Harpoon

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 PLAN:

- (U) N/A

2. (U) FY 1998 PLAN:

- (U) (\$0) Develop missile hardware and software modifications (funded by Boeing)
- (U) (\$0) Develop ship modifications (funded by Boeing)
- (U) (\$0) Perform Preliminary Design Review (funded by Boeing)

3. (U) FY 1999 PLAN:

- (U) (\$0) Continue missile and launch control development and conduct Critical Design Review (funded by Boeing)
- (U) (\$ 965) Begin test & evaluation (T&E)
- (U) (\$1,000) Conduct CDR and engineering Integrated Project Team (IPT)

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998/99 President's Budget:	0	0	0
(U) Appropriated Value	0	0	0
(U) Adjustments from PRESBUDG:	0	0	+1,965
(U) FY 1999 PRESBUDG Submit:	0	0	1,965

Exhibit R-2

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0604227N

PROGRAM ELEMENT TITLE: Harpoon Modifications

PROJECT NUMBER: W1843

PROJECT TITLE: Harpoon

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY99 budget of \$1,965K is to conduct US Navy Team support and begin Navy T&E in the contractor funded development of the Harpoon Block II upgrade.

(U) Schedule: N/A

(U) Technical: N/A

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

	<u>FY 1997</u> <u>ACTUAL</u>	<u>FY 1998</u> <u>ESTIMATE</u>	<u>FY 1999</u> <u>ESTIMATE</u>	<u>FY 2000</u> <u>ESTIMATE</u>	<u>FY 2001</u> <u>ESTIMATE</u>	<u>FY 2002</u> <u>ESTIMATE</u>	<u>FY 2003</u> <u>ESTIMATE</u>	<u>TO</u> <u>COMPLETE</u>	<u>TOTAL</u> <u>PROGRAM</u>
WPN Line 18									
Harp Bk II	0	0	0	0	2,800	5,700	6,500	0	15,000
OPN Line 143									
Harp Bk II	0	0	0	500	500	0	0	0	1,000

(U) RELATED RDT&E: Not applicable.

Exhibit R-2

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0604227N

PROJECT NUMBER: W1843

PROGRAM ELEMENT TITLE: Harpoon Modifications

PROJECT TITLE: Harpoon

D. (U) SCHEDULE PROFILE:

	<u>FY 1997</u>	<u>FY 1998 *</u>	<u>FY 1999</u>	<u>TO COMPLETE</u>
Program Milestones	N/A N/A		2Q CDR	
Engineering Milestones	N/A N/A	4Q PDR		
T&E Milestones	N/A N/A		3Q/99-1Q/00 Captive Carry Testing	2Q/00-1Q/01 TECHEVAL/OPEVAL
Contract Milestones	N/A N/A	2Q agreement signed**		3Q/01 FRP

\* FY 1998 effort funded by Boeing

\*\* Agreement signed in lieu of a formal contract with Boeing

Exhibit R-2

**UNCLASSIFIED**

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

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0604227N

PROJECT NUMBER: W1843

PROGRAM ELEMENT TITLE: Harpoon Modifications

PROJECT TITLE: Harpoon

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

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Test & Evaluation	0	0	965
b. Government Field Support	0	0	950
c. Travel	0	0	50
<b>Total</b>	<b>0</b>	<b>0</b>	<b>1,965</b>

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

PERFORMING ORGANIZATIONS

Contractor/ Government Performing <u>Activity</u>	Contract Method/ Fund Type <u>Vehicle</u>	Award/ Oblig <u>Date</u>	Perform Activity <u>EAC</u>	Project Office <u>EAC</u>	Total FY 1996 & Prior	FY 1997 <u>Budget</u>	FY 1998 <u>Budget</u>	FY 1999 <u>Budget</u>	To <u>Comp</u>	Total <u>Program</u>
Product Development:										
China Lake, CA	WX	11/98	1,100	1,100	0	0	0	500	600	1,100
Point Mugu, CA	WX	11/98	850	850	0	0	0	450	400	850
N/										
Support and Management:										
Miscellaneous		11/98	150	150	0	0	0	50	100	150
Test and Evaluation:										
Point Mugu, CA	WX	11/98	2,800	2,800	0	0	0	965	1,835	2,800

GOVERNMENT FURNISHED PROPERTY: Not applicable.

Exhibit R-3

**UNCLASSIFIED**

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

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0604227N

PROJECT NUMBER: W1843

PROGRAM ELEMENT TITLE: Harpoon Modifications

PROJECT TITLE: Harpoon

	<u>Total</u> <u>FY 1996</u> <u>&amp; Prior</u>	<u>FY 1997</u> <u>Budget</u>	<u>FY 1998</u> <u>Budget</u>	<u>FY 1999</u> <u>Budget</u>	<u>To</u> <u>Complete</u>	<u>Total</u> <u>Program</u>
Subtotal Production Development	0	0	0	950	1,000	1,950
Subtotal Support and Management	0	0	0	50	100	150
Subtotal Test and Evaluation	0	0	0	965	1,835	2,800
Total Project	0	0	0	1,965	2,935	4,900

Exhibit R-3

**UNCLASSIFIED**



**UNCLASSIFIED**

DATE: February 1998

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 07

PROGRAM ELEMENT: 0702207N

PROGRAM ELEMENT TITLE: DEPOT MAINTENANCE (Non-IF)

(U) COST: (Dollars in Thousands)

<u>PROJECT NUMBER &amp; TITLE</u>	<u>FY 1997 ACTUAL</u>	<u>FY 1998 ESTIMATE</u>	<u>FY 1999 ESTIMATE</u>	<u>FY 2000 ESTIMATE</u>	<u>FY 2001 ESTIMATE</u>	<u>FY 2002 ESTIMATE</u>	<u>FY 2003 ESTIMATE</u>	<u>TO COMPLETE</u>	<u>TOTAL PROGRAM</u>
H2451 P-3C SLAP	0	0	28,694	24,376	19,535	0	0	0	72,605
H2452 S-3B/ES-3A SLAP	0	0	23,781	14,489	4,786	0	0	0	43,056
H2453 AV-8B ALEP	0	0	11,006	5,678	8,205	6,902	5,133	CONT	CONT
H2454 AN/ARC-210 - RT-1794(C)	0	0	6,486	1,762	586	778	0	0	9,612
<b>TOTAL</b>	0	0	69,967	46,305	33,112	7,680	5,133	CONT	CONT

(U) MISSION DESCRIPTION AND BUDGET ITEM DESCRIPTION: In FY1999 RDT&E Service Life Assessment Program (SLAP) will commence on the P-3C (H2451) and S-3B/ES-3A (H2452). Similar to the SLAP effort, an Aircraft Life Extension Program (ALEP) will commence on the AV-8B (H2453). These efforts are required to be conducted for these airframes to ascertain what actions must be taken to safely operate each system until the targeted end of service life. The results of the SLAP/ALEP also provide justification for funding a Service Life Extension Program (SLEP) for fatigue limiting components with APN-5 funding if necessary. The AN/ARC-210 - RT-1794(C) (H2454) will provide for the development of radio software modifications required for upgrades to the evolving standards.

R-1 Item no. 187

Exhibit R-2, RDT&E Budget Item Justification  
(Exhibit R-2, Page 1 of 26)

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# UNCLASSIFIED

DATE: February 1998

BUDGET ACTIVITY: 07

PROGRAM ELEMENT: 0702207N

PROGRAM ELEMENT TITLE: DEPOT MAINTENANCE (Non-IF)

The P-3C Service Life Assessment Program (SLAP), project H2451, will perform engineering efforts which will result in an P-3C Service Life Extension Program (SLEP). SLAP includes a fatigue article destructive test of a full scale P-3C, associated pre-test and post-test analyses, and post-test disposal. SLEP is a fatigue life extension program that will extend operational service life by replacing fatigue limiting airframe components. Present fatigue life estimates (from 20,000 to 24,000 flight hours) are based on analysis alone. SLAP will identify specific components that require replacement or modification in order to extend the aircraft model's service life beyond its original design parameters by approximately 6,000 flight hours.

The S-3B/ES-3A SLAP, project H2452, will determine the present S-3B/ES-3A fatigue for 116 aircraft which were all procured from 1972 to 1976. The intent is to determine the magnitude of the SLEP necessary to extend the aircraft service life through 2015. The SLAP will certify an increase of the aircraft fatigue life from 13,000 flight hours to approximately 17,500 flight hours and from 3,000 to 4,300 catapults/arrested landings.

The AV-8B ALEP, project H2453, will resolve problems with critical life pacing items such as landing gear, their supporting airframe structure, dynamically loaded structure and other life limiting components (stabilator, vertical tail). The T/AV-8B design service life is 6,000 flight hours, but usage has given an approximate life of 11,000 service hours for the wing attach structure. This requires the airframe and components be tracked for fatigue life and an ALEP performed on the airframe and fatigue critical components. The T/AV-8B ALEP will perform fatigue and operational loads analysis, including dynamic environments, to verify the 2015 service life requirement. The T/AV-8B ALEP will perform the following: update of the Fatigue Life Tracking System (FLTS) of the aircraft, including the onboard program that calculates in-flight loads and records flight parameters for performing life assessments; instrumenting a production airframe to measure dynamic loads; flight testing to record dynamic loads; perform loads generation; analyses of the life critical structure; finite element modeling of the airframe, fatigue testing of critical areas of the airframe to determine the service life assessment; and a post test teardown.

The AN/ARC-210 - RT-1794(C), project H2454, provides for the development of radio software modifications required for upgrades to the evolving standards. Annual engineering change proposals to accomplish implementation of additional advanced waveforms, have been planned to maintain interoperability with other services, the Federal Aviation Administration (FAA) and the International Civil Aviation Organization (ICAO) [Global Air Traffic Management (GATM)/Global Access Navigation and Safety (GANS)]. Implementation of these waveforms is essential and will be accomplished in the Fleet by organizational units via the Memory Loader Verifier System (MLVS). These changes are the responsibility of the radio program for funding, management and execution.

Engineering change orders reflect the costs to support operational requirements document requirements for a planned upgrade to provide: (1) increase in the ARC-210 functionality, interoperability and certification; (2) implementation of additional advanced waveforms; (3) Protocol and Variable Message Format messages for Close Air Support (CAS); (4) Demand Assigned Multiple Access (DAMA) Satellite Communications (SATCOM); (5) embedded Communications Security (COMSEC); and (6) Link 4A. The RT-1794(C) will be integrated and operational in the F/A-18 C/D/E/F, AH-1W, UH-1N, C-2, and AV-8B. The RT-1794(C) retains all production baseline functions, and embeds the new functions of COMSEC (KY-58, YV-5, KGV-11, and KG-84), DAMA SATCOM (MIL-STD 188-181/182/183), and CAS Digital Message Transfer (MIL STD 188-220A), VMF-Variable Message Format.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it encompasses engineering and manufacturing development for upgrade of an existing, operational system.

R-1 Item no. 187

Exhibit R-2, RDT&E Budget Item Justification  
(Exhibit R-2, Page 2 of 26)

# UNCLASSIFIED

**UNCLASSIFIED**

DATE: February 1998

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 07

PROGRAM ELEMENT: 0702207N

PROJECT NUMBER: H2451

PROGRAM ELEMENT TITLE: P-3 SERVICE LIFE ASSESSMENT PROGRAM

PROJECT TITLE: P-3 SLAP

(U) COST: (Dollars in Thousands)

PROJECT

NUMBER &  
TITLE

	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
H2451 P-3 SLAP	0	0	28,694	24,376	19,535	0	0	0	72,605

A. (U) MISSION DESCRIPTION AND BUDGET ITEM DESCRIPTION: The P-3C Service Life Assessment Program (SLAP) will perform engineering efforts to determine the P-3C Service Life Extension Program (SLEP). SLAP includes a fatigue article destructive test of a full scale P-3C, associated pre-test and post-test analyses, and post-test disposal. SLEP is a fatigue life extension program that will extend operational service life by replacing fatigue limiting airframe components. Present fatigue life estimates (from 20,000 to 24,000 flight hours) are based on analysis alone. SLAP will identify specific components that require replacement or modification in order to extend the aircraft model's service life beyond its original design parameters by approximately 6,000 flight hours.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

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

2. (U) FY 1998 PLAN: Not Applicable.

3. (U) FY 1999 PLAN:

- (U) (\$25,873) Reaction frame buildup, preanalysis, aircraft preparation.
- (U) (\$950) Data: Preliminary engineering reports, quality assurance reports, preliminary SLEP drawings, cost schedule status reporting.
- (U) (\$1,087) Contract support services, travel.
- (U) (\$784) Naval Air Warfare Center (NAWC) field support

R-1 Item no. 187

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

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 07

PROGRAM ELEMENT: 0702207N

PROJECT NUMBER: H2451

PROGRAM ELEMENT TITLE: P-3 SERVICE LIFE ASSESSMENT PROGRAM

PROJECT TITLE: P-3 SLAP

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	0	0	0
(U) Appropriated Value:	0	0	0
(U) Adjustments from PRESBUDG:	0	0	+28,694
(U) FY 1999 President's Budget Submit:	0	0	28,694

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: The net increase of +\$28,694 thousand in FY99 reflects an increase of +\$29,200 thousand to fund SLAP efforts and a -\$506 thousand adjustment for Commercial Purchases Inflation.

(U) Schedule: Not Applicable.

(U) Technical: Not Applicable.

C. (U) OTHER PROGRAM FUNDING SUMMARY: None

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DATE: February 1998

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 07

PROGRAM ELEMENT: 0702207N

PROJECT NUMBER: H2451

PROGRAM ELEMENT TITLE: P-3 SERVICE LIFE ASSESSMENT PROGRAM

PROJECT TITLE: P-3 SLAP

(U) RELATED RDT&E: Not Applicable.

D. (U) SCHEDULE PROFILE:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>TO COMPLETE</u>
Program Milestones				
Engineering Milestones			Preliminary Design Review (2Q) Critical Design Review (3Q)	1Q/01 Conduct Fatigue Test 4Q/01 SLEP Kit Data Package
T&E Milestones				
Contract Milestones			Contract Award (1Q)	

R-1 Item no. 187

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

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

BUDGET ACTIVITY: 07

PROGRAM ELEMENT: 0702207N

PROJECT NUMBER: H2451

PROGRAM ELEMENT TITLE: P-3 SERVICE LIFE ASSESSMENT PROGRAM

PROJECT TITLE: P-3 SLAP

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

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Contract	0	0	26,823
b. Technical Support (CS)	0	0	1,087
c. Field Support	0	0	784
Total	0	0	28,694

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Exhibit R-3, RDT&E Program Element/Project Cost Breakdown  
(Exhibit R-3, Page 6 of 26)

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DATE: February 1998

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

BUDGET ACTIVITY: 07

PROGRAM ELEMENT: 0702207N

PROJECT NUMBER: H2451

PROGRAM ELEMENT TITLE: P-3 SERVICE LIFE ASSESSMENT PROGRAM

PROJECT TITLE: P-3 SLAP

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

PERFORMING ORGANIZATIONS

<u>Contractor/ Government Performing Activity</u>	<u>Contract Method/ Fund Type Vehicle</u>	<u>Award/ Oblig Date</u>	<u>Perform Activity EAC</u>	<u>Project Office EAC</u>	<u>Total FY 1996 &amp; Prior</u>	<u>FY 1997 Actual</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Product Development										
TBD	C/FFP	11/98	TBD	TBD	0	0	0	26,823	39,108	65,931
Other contracts less than \$1.0M										
NAWC/AD		10/98	TBD	TBD	0	0	0	784	2,434	3,218
Support and Management										
TBD	C/FFP	11/98	TBD	TBD				1,087	2,369	3,456
Other contracts less than \$1.0M										
Test and Evaluation										
Other contracts less than \$1.0M										

GOVERNMENT FURNISHED PROPERTY: One P-3C that has completed the P-3C Sustained Readiness Program modification will be provided as government furnished property to the contractor. This aircraft will be instrumented and then tested to destruction.

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Exhibit R-3, RDT&E Program Element/Project Cost Breakdown  
(Exhibit R-3, Page 7 of 26)

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DATE: February 1998

FY 1999 PROGRAM ELEMENT/PROJECT COST BREAKDOWN

BUDGET ACTIVITY: 07 PROGRAM ELEMENT: 0702207N

PROJECT NUMBER: H2451

PROGRAM ELEMENT TITLE: P-3 SERVICE LIFE ASSESSMENT PROGRAM

PROJECT TITLE: P-3 SLAP

	Total FY 1996 & Prior	FY 1997 Actual	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Subtotal Production Development	0	0	0	27,607	41,542	69,149
Subtotal Support and Management	0	0	0	1,087	2,369	3,456
Subtotal Test and Evaluation	0	0	0	0	0	0
Total Project	0	0	0	28,694	43,911	72,605

R-1 Item no. 187

Exhibit R-3, RDT&E Program Element/Project Cost Breakdown  
(Exhibit R-3, Page 8 of 26)

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DATE: February 1998

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 07

PROGRAM ELEMENT: 0702207N

PROJECT NUMBER: H2452

PROGRAM ELEMENT TITLE: S-3/ES-3 SERVICE LIFE ASSESSMENT PROGRAM PROJECT TITLE: S-3/ES-3 SLAP

(U) COST: (Dollars in Thousands)

PROJECT  
NUMBER &  
TITLE

	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
H2452 S-3/ES-3 SLAP	0	0	23,781	14,489	4,786	0	0	0	43,056

(U) MISSION DESCRIPTION AND BUDGET ITEM DESCRIPTION: H2452 S-3/ES-3 SLAP - The S-3B/ES-3A SLAP (H2452) will determine the present S-3B/ES-3A fatigue for 116 aircraft which were all procured from 1972 to 1976. The intent is to determine the magnitude of the SLEP necessary to extend the aircraft service life through 2015. The SLAP will certify an increase of the aircraft fatigue life from 13,000 flight hours to approximately 17,500 flight hours and from 3,000 to 4,300 catapults/arrested landings.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 PLAN: Not Applicable.
2. (U) FY 1998 PLAN: Not Applicable.
3. (U) FY 1999 PLAN
  - (U) (\$ 22,881) Award SLAP/Full Scale Fatigue Test (FSFT) contract option.
  - (U) (\$ 600) Establish field activity support for SLAP/FSFT efforts.
  - (U) (\$ 300) Contract support services, travel.

R-1 Item no. 187

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

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 07      PROGRAM ELEMENT: 0702207N      PROJECT NUMBER: H2452  
 PROGRAM ELEMENT TITLE: S-3/ES-3 SERVICE LIFE ASSESSMENT PROGRAM      PROJECT TITLE: S-3/ES-3 SLAP

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	0	0	0
(U) Appropriated Value:	0	0	0
(U) Adjustments from PRESBUDG:	0	0	+23,781
(U) FY 1999 President's Budget Submit:	0	0	23,781

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: The net increase of +\$23,781 thousand in FY99 reflects an increase of +\$24,200 thousand to fund SLAP efforts and a decrease of -\$419 thousand for Commercial Purchases Inflation adjustment.

(U) Schedule: Not Applicable.

(U) Technical: Not Applicable.

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

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY2001</u>	<u>FY2002</u>	<u>FY2003</u>	<u>TO</u>	<u>TOTAL</u>	<u>COMPLETE</u>	<u>PROGRAM</u>
	<u>ACTUAL</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>
(U) APN S-3 (OSIP 12-95)	2,955	9,730	12,457	7,601	11,321	7,670	3,891	1,875	62,953		
(U) APN ES-3 (OSIP 33-95)	2,193	1,521	1,055	1,375	1,407	2,801	3,790	4,191	21,983		

NOTE: Both critical structure OSIPs contain all S-3B/ES-3A structural degraders, not just those associated with SLAP.

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

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 07

PROGRAM ELEMENT: 0702207N

PROJECT NUMBER: H2452

PROGRAM ELEMENT TITLE: S-3/ES-3 SERVICE LIFE ASSESSMENT PROGRAM PROJECT TITLE: S-3/ES-3 SLAP

(U) RELATED RDT&E: Not Applicable.

D. (U) SCHEDULE PROFILE:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999 TO COMPLETE</u>
Program Milestones			
Engineering Milestones			Test Fixture Design Analysis (3Q)      CONT
T&E Milestones			
Contract Milestones			Contract Award (1Q)      CONT

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

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

BUDGET ACTIVITY: 07

PROGRAM ELEMENT: 0702207N

PROJECT NUMBER: H2452

PROGRAM ELEMENT TITLE: S-3/ES-3 SERVICE LIFE ASSESSMENT PROGRAM PROJECT TITLE: S-3/ES-3 SLAP

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

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Contract	0	0	22,881
b. Technical Support (CS)	0	0	300
c. Field Support	0	0	600
Total	0	0	23,781

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Exhibit R-3, RDT&E Program Element/Project Cost Breakdown  
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DATE: February 1998

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

BUDGET ACTIVITY: 07

PROGRAM ELEMENT: 0702207N

PROJECT NUMBER: H2452

PROGRAM ELEMENT TITLE: S-3/ES-3 SERVICE LIFE ASSESSMENT PROGRAM PROJECT TITLE: S-3/ES-3 SLAP

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

PERFORMING ORGANIZATIONS

<u>Contractor/ Government Performing Activity</u>	<u>Contract Method/ Fund Type Vehicle</u>	<u>Award/ Oblig Date</u>	<u>Perform Activity EAC</u>	<u>Project Office EAC</u>	<u>Total FY 1996 &amp; Prior</u>	<u>FY 1997 Actual</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Product Development LMAS (Miami,FL) Other Contracts less than \$1.0M	SS/CPIF	12/98	TBD	TBD	0	0	0	23,300	18,697	41,997
Support and Management Miscellaneous Other Contracts less than \$1.0M		Var	TBD	TBD	0	0	0	172	385	557
Test and Evaluation Miscellaneous Other Contracts less than \$1.0M		Var	TBD	TBD	0	0	0	309	193	502

GOVERNMENT FURNISHED PROPERTY: Not Applicable

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Exhibit R-3, RDT&E Program Element/Project Cost Breakdown  
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FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

BUDGET ACTIVITY: 07

PROGRAM ELEMENT: 0702207N

PROJECT NUMBER: H2452

PROGRAM ELEMENT TITLE: S-3/ES-3 SERVICE LIFE ASSESSMENT

PROGRAM PROJECT TITLE: S-3/ES-3SLAP

	<u>FY 1996 &amp; Prior</u>	<u>FY 1997 Actual</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Subtotal Production Development	0	0	0	23,300	18,697	41,997
Subtotal Support and Management	0	0	0	172	385	557
Subtotal Test and Evaluation	0	0	0	309	193	502
Total Project	0	0	0	23,781	19,275	43,056

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Exhibit R-3, RDT&E Program Element/Project Cost Breakdown  
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DATE: February 1998

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 07

PROGRAM ELEMENT: 0702207N

PROJECT NUMBER: H2453

PROGRAM ELEMENT TITLE: Depot Maintenance

PROJECT TITLE: AV-8B Aircraft Life Extension Program

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
H2453 AV-8B Aircraft Life Extension Program	0	0	11,006	5,678	8,205	6,902	5,133	CONT	CONT

A. (U) MISSION DESCRIPTION AND BUDGET ITEM DESCRIPTION: The AV-8B Aircraft Life Extension Program (ALEP) resolves problems with critical life pacing items such as landing gear, their supporting airframe structure, dynamically loaded structure and other life limiting components (stabilator, vertical tail). The T/AV-8B design service life is 6,000 flight hours, but usage has given an approximate life of 11,000 service hours for the wing attach structure. This requires the airframe and components be tracked for fatigue life and an ALEP performed on the airframe and fatigue critical components. The T/AV-8B ALEP will perform fatigue and operational loads analysis, including dynamic environments, to verify the 2015 service life requirement. The T/AV-8B ALEP non-recurring engineering (NRE) will perform the following: updates to the FLTS of the aircraft, including the onboard program that calculates in-flight loads and records flight parameters for performing life assessments; instrumenting a production airframe to measure dynamic loads; flight testing to record dynamic loads; perform loads generation; analyses of the life critical structure; finite element modeling of the airframe, fatigue testing of critical areas of the airframe to determine the service life assessment; and a post test teardown.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

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

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## FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 07

PROGRAM ELEMENT: 0702207N

PROJECT NUMBER: H2453

PROGRAM ELEMENT TITLE: Depot Maintenance

PROJECT TITLE: AV-8B Aircraft  
Life Extension Program

### 3. (U) FY 1999 PLAN:

- (U) (\$1,350) Commence engineering of Finite Element Analyses of the T/AV-8B aircraft configurations for internal loads, stresses, dynamic response and vibration.
- (U) (\$1,219) Commence Non-Destructive teardown inspections of aircraft with F402-RR-408 engines installed. These will include three Radar aircraft and two Night Attack aircraft.
- (U) (\$1,750) Commence design and integration of instrumentation of an aircraft for flight test to measure structural dynamic loads and responses in support of the Structural Dynamics Service Life Assessment Program (SDSLAP).
- (U) (\$2,056) Commence engineering and programming of revision to Fatigue Tracking Users Program (FTUP) to update the requirements to record more flight loads/flight parameters for service life assessment/fatigue life tracking.
- (U) (\$2,956) Commence engineering for the integration of an Advanced Memory Unit (AMU) to record the increased data requirements for the onboard fatigue tracking program.
- (U) (\$ 856) Commence engineering, programming and integration of the Fatigue Life Tracking System (FLTS) for structural service life assessment.
- (U) (\$ 819) Commence fatigue testing of critical structure for structural service life assessment of main landing gear (MLG) and nose landing gear (NLG) systems.

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

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BUDGET ACTIVITY: 07

PROGRAM ELEMENT: 0702207N

PROGRAM ELEMENT TITLE: Depot Maintenance

PROJECT NUMBER: H2453

PROJECT TITLE: AV-8B Aircraft  
Life Extension Program

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	0	0	0
(U) Appropriated Value:	0	0	0
(U) Adjustments from PRESBUDG:	0	0	+11,006
(U) FY 1999 President's Budget Submit:	0	0	11,006

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: The net increase of +\$11,006 thousand in FY99 reflects an increase of +\$11,200 thousand for the ALEP effort and a decrease of -\$194 thousand for Commercial Purchases Inflation adjustment.

(U) Schedule: Not Applicable.

(U) Technical: Not Applicable.

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

<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY2002</u>	<u>FY2003</u>	<u>TO</u>	<u>TOTAL</u>
<u>ACTUAL</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>ESTIMATE</u>	<u>COMPLETE</u>	<u>PROGRAM</u>
(U) APN-1/Line 1/2/AV-8B								
354,002	294,419	338,399	292,500	191,418	0	0	0	1,444,216
(U) QTY								
12	12	12	12	8	0	0	0	
(U) APN-5/Line 20/AV-8 Series								
22,163	31,879	99,109	73,625	60,560	25,014	32,748	CONT	CONT
(U) APN-6/Spares								
5,076	24,725	25,716	12,241	8,438	45	46		76,006

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Exhibit R-2, RDT&E Budget Item Justification  
(Exhibit R-2, Page 17 of 26)

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DATE: February 1998

FY 1999 BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 07

PROGRAM ELEMENT: 0702207N

PROJECT NUMBER: H2453

PROGRAM ELEMENT TITLE: Depot Maintenance

PROJECT TITLE: AV-8B Aircraft

Life Extension Program

(U) RELATED RDT&E: P.E. 0604214N, Project Unit H0652, AV-8B Aircraft

D. (U) SCHEDULE PROFILE:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>TO COMPLETE</u>
Program Milestones			4Q MLG SLAP Comp	
Engineering Milestones			4Q/FTUP PDR 3Q/SDSLAP PDR	3Q/00 FTUP CDR 3Q/00 AMU PDR 1Q/01 AMU CDR 4Q 00 SDSLAP CDR
T&E Milestones				1Q/01 FTUP OT 3Q 01 AMU OT
Contract Milestones				

R-1 Item no. 187

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

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

BUDGET ACTIVITY: 07

PROGRAM ELEMENT: 0702207N

PROJECT NUMBER: H2453

PROGRAM ELEMENT TITLE: Depot Maintenance

PROJECT TITLE: AV-8B Aircraft  
Life Extension Program

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

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Contracts (CS)	0	0	125
b. Technical Support	0	0	3,226
c. Engineering Development	0	0	7,356
d. Testing	0	0	279
e. Travel	0	0	20
Total	0	0	11,006

R-1 Item no. 187

Exhibit R-3, RDT&E Program Element/Project Cost Breakdown  
(Exhibit R-3, Page 19 of 26)

**UNCLASSIFIED**

**UNCLASSIFIED**

DATE: February 1998

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

BUDGET ACTIVITY: 07

PROGRAM ELEMENT: 0702207N

PROJECT NUMBER: H2453

PROGRAM ELEMENT TITLE: Depot Maintenance

PROJECT TITLE: AV-8B Aircraft  
Life Extension Program

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

PERFORMING ORGANIZATIONS

<u>Contractor/ Government Performing Activity</u>	<u>Contract Method/ Fund Type Vehicle</u>	<u>Award/ Oblig Date</u>	<u>Perform Activity EAC</u>	<u>Project Office EAC</u>	<u>Total FY 1996 &amp; Prior</u>	<u>FY 1997 Actual</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Product Development										
NAWC-WD China Lake, CA	WX	10/98	TBD	TBD	0	0	0	4,734	CONT	CONT
NAWC-AD Patuxent River, MD	WX	10/98	TBD	TBD	0	0	0	1,932	CONT	CONT
NADEP Cherry Point, NC	WX	10/98	TBD	TBD	0	0	0	1,417	CONT	CONT
CONTRACTS/MDA MISC/Hill AFB	Var MIPR	10/98 10/98	TBD TBD	TBD TBD	0 0	0 0	0 0	1,947 572	CONT CONT	CONT CONT
Support and Management										
MISC/Contracts	Var	Var	TBD	TBD	0	0	0	125	CONT	CONT
Test and Evaluation										
NAWC/WD CHINA LAKE,CA	WX	10/98	TBD	TBD	0	0	0	279	CONT	CONT

R-1 Item no. 187

Exhibit R-3, RDT&E Program Element/Project Cost Breakdown  
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**UNCLASSIFIED**

**UNCLASSIFIED**

DATE: February 1998

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

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0702207N

PROJECT NUMBER: H2454

PROGRAM ELEMENT TITLE: DEPOT MAINTENANCE

PROJECT TITLE: AV-8B Aircraft  
Life Extension Program

	<u>FY 1996</u> <u>&amp; Prior</u>	<u>FY 1997</u> <u>Actual</u>	<u>FY 1998</u> <u>Budget</u>	<u>FY 1999</u> <u>Budget</u>	<u>To</u> <u>Complete</u>	<u>Total</u> <u>Program</u>
Subtotal Product Development	0	0	0	10,602	CONT	CONT
Subtotal Support and Management	0	0	0	125	CONT	CONT
Subtotal Test and Evaluation	0	0	0	279	CONT	CONT
Total Project	0	0	0	11,006	CONT	CONT

R-1 Item no. 187

Exhibit R-3, RDT&E Program Element/Project Cost Breakdown  
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**UNCLASSIFIED**

**UNCLASSIFIED**

DATE: February 1998

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 07

PROGRAM ELEMENT: 0702207N

PROJECT NUMBER: H2454

PROGRAM ELEMENT TITLE: DEPOT MAINTENANCE

PROJECT TITLE: AN/ARC-210 - RT-1794(C)

(U) COST (Dollars in thousands)

<u>PROJECT NUMBER &amp; TITLE</u>	<u>FY 1997 ACTUAL</u>	<u>FY 1998 ESTIMATE</u>	<u>FY 1999 ESTIMATE</u>	<u>FY 2000 ESTIMATE</u>	<u>FY 2001 ESTIMATE</u>	<u>FY 2002 ESTIMATE</u>	<u>FY 2003 ESTIMATE</u>	<u>TO COMPLETE</u>	<u>TOTAL PROGRAM</u>
H2454 AN/ARC-210 - RT-1794(C)	0	0	6,486	1,762	586	778	0	0	9,612

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: Project H2454, AN/ARC-210 - RT-1794(C): This project provides for the development of radio software modifications required for upgrades to the evolving standards. Annual engineering change proposals to accomplish implementation of additional advanced waveforms, have been planned to maintain interoperability with other services, FAA and ICAO (GATM/GANS). Implementation of these waveforms is essential and will be accomplished in the Fleet by organizational units via the Memory Loader Verifier System (MLVS). These changes are the responsibility of the radio program for funding, management and execution.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

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

(U) (\$6,486) Develop upgrades and initiate Engineering Change Order (ECO) for digital battlefield interoperability communication requirements for voice and data link requirements for precision approach.

**UNCLASSIFIED**

DATE: February 1998

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

BUDGET ACTIVITY: 07

PROGRAM ELEMENT: 0702207N

PROJECT NUMBER: H2454

PROGRAM ELEMENT TITLE: DEPOT MAINTENANCE

PROJECT TITLE: AN/ARC-210 - RT-1794(C)

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	0	0	0
(U) Appropriated Value:	0	0	0
(U) Adjustments from PRESBUDG:	0	0	+6,486
(U) FY 1999 President's budget:	0	0	6,486

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: The net increase of +\$6,486 thousand in FY99 reflects an increase of +\$6,600 thousand to fund the development of radio software modifications and a decrease of -\$114 thousand adjustment for Commercial Purchases Inflation.

(U) Schedule: Not Applicable.

(U) Technical: Not Applicable.

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

(U) RELATED RDT&E: Not Applicable.

D. (U) SCHEDULE PROFILE: Not Applicable.

R-1 Item no. 187

Exhibit R-2, RDT&E Budget Item Justification  
(Exhibit R-2, Page 23 of 26)

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DATE: February 1998

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

BUDGET ACTIVITY: 07

PROGRAM ELEMENT: 0702207N

PROJECT NUMBER: H2454

PROGRAM ELEMENT TITLE: DEPOT MAINTENANCE

PROJECT TITLE: AN/ARC-210 /RT-1794(C)

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

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Program Planning	0	0	90
b. Prime Eqpmt/E&MD Prime Contractor	0	0	6,000
c. System T&E/OT&E	0	0	75
d. Systems Engineering	0	0	200
e. Contractor Support	0	0	85
f. Travel	0	0	36
Total	0	0	6,486

R-1 Item no. 187

Exhibit R-3, RDT&E Program Element/Project Cost Breakdown  
(Exhibit R-3, Page 24 of 26)

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**UNCLASSIFIED**

DATE: February 1998

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

BUDGET ACTIVITY: 07

PROGRAM ELEMENT: 0702207N  
PROGRAM ELEMENT TITLE: DEPOT MAINTENANCE

PROJECT NUMBER: H2454  
PROJECT TITLE: AN/ARC 210 /RT-1794(C)

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

PERFORMING ORGANIZATIONS

<u>Contractor/ Government Performing Activity</u>	<u>Contract Method/ Fund Type Vehicle</u>	<u>Award/ Oblig Date</u>	<u>Perform Activity EAC</u>	<u>Project Office EAC</u>	<u>Total FY 1996 &amp; Prior</u>	<u>FY 1997 Budget</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Product Development										
Rockwell	Var	3/99	TBD	TBD	0	0	0	6,000	2,801	8,801
Misc		2/99	TBD	TBD	0	0	0	326	170	496
Support and Management										
Misc	Var	2/99	TBD	TBD	0	0	0	85	80	165
Test and Evaluation										
Misc	Var	2/99	TBD	TBD	0	0	0	75	75	150

GOVERNMENT FURNISHED PROPERTY: Not Applicable.

R-1 Item no. 187

Exhibit R-3, RDT&E Program Element/Project Cost Breakdown  
(Exhibit R-3, Page 25 of 26)

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DATE: February 1998

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

BUDGET ACTIVITY: 07

PROGRAM ELEMENT: 0702207N

PROJECT NUMBER: H2454

PROGRAM ELEMENT TITLE: DEPOT MAINTENANCE

PROJECT TITLE: AN/ARC-210 /RT-1794(C)

	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Subtotal Production Development	0	0	0	6,326	2,971	9,297
Subtotal Support and Management	0	0	0	85	80	165
Subtotal Test and Evaluation	0	0	0	75	75	150
Total Project	0	0	0	6,486	3,126	9,612

R-1 Item no. 187

Exhibit R-3, RDT&E Program Element/Project Cost Breakdown  
(Exhibit R-3, Page 26 of 26)

**UNCLASSIFIED**

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0708011N

PROGRAM ELEMENT TITLE: Manufacturing Technology Development

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM	
R1050	Manufacturing Technology									
	79,851	53,369	59,060	59,867	61,217	62,314	63,555	CONT.	CONT.	
R2322	Acquisition Center of Excellence									
	4,386	*	*	*	*	*	*	*	4,386	
TOTAL	84,237	53,369	59,060	59,867	61,217	62,314	63,555	CONT.	CONT.	

\*Funded in P.E. 0605804N project R0835 beginning in FY 1998.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Manufacturing Technology (MANTECH) Program is intended to improve the productivity and responsiveness of the U.S. defense industrial base by funding the development of manufacturing technologies. The MANTECH program, by providing seed funding for the development of moderate to high risk process and equipment technology, permits contractors to upgrade their manufacturing capabilities. Ultimately, the program aims to produce high-quality weapon systems with shorter lead times and reduced acquisition costs. Major areas of endeavor both underway and planned include: advanced manufacturing technology for electronics assembly, laser metalworking, flexible computer manufacturing, composites, metalworking and welding technology. The MANTECH program is being integrated into the Joint Mission Area/Support Area and Joint Warfare Operational Capability process and will utilize the results of these initiatives as appropriate in the program planning process. The MANTECH program is aimed at achieving affordability in the acquisition of weapons systems by inserting manufacturing process solutions early into the design phase to reduce lifecycle costs, improve schedules and ensure quality.

(U) This program element funds the Acquisition Center of Excellence in FY 1997.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it encompasses engineering and manufacturing development for upgrade of existing, operational systems.

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Budget Item Justification  
(Exhibit R-2, page 1 of 11)

# UNCLASSIFIED

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0708011N

PROGRAM ELEMENT TITLE: Manufacturing Technology Development

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
R1050	Manufacturing Technology 79,851	53,369	59,060	59,867	61,217	62,314	63,555	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Manufacturing Technology (MANTECH) Program is intended to improve the productivity and responsiveness of the U.S. defense industrial base by funding the development of manufacturing technologies. The MANTECH program, by providing seed funding for the development of moderate to high risk process and equipment technology, permits contractors to upgrade their manufacturing capabilities. Ultimately, the program aims to produce high-quality weapon systems with shorter lead times and reduced acquisition costs. Major areas of endeavor both underway and planned include: advanced manufacturing technology for electronics assembly, laser metalworking, flexible computer manufacturing, composites, metalworking and welding technology. The MANTECH program is being integrated into the Joint Mission Area/Support Area and Joint Warfare Operational Capability process and will utilize the results of these initiatives as appropriate in the program planning process.

The MANTECH program is aimed at achieving affordability in the acquisition of weapons systems by inserting manufacturing process solutions early into the design phase to reduce lifecycle costs, improve schedules and ensure quality.

R-1 Line Item 188

Budget Item Justification  
(Exhibit R-2, page 2 of 11)

# UNCLASSIFIED

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0708011N      PROJECT NUMBER: R1050  
PROGRAM ELEMENT TITLE: Manufacturing Technology      PROJECT TITLE: Manufacturing Technology  
Development

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS: (While the control amount for FY 1997 is \$79,851 thousand, the actual execution amount is \$94,575 thousand. This reflects the \$37,400 thousand being forward financed from FY 1996 and \$57,175 thousand in FY 1997 funds. \$22,676 thousand of FY 1997 funds is being forward financed to FY 1998.)
  - (U) The Navy MANTECH program executes a significant amount of its projects through its Centers of Excellence. The technical efforts performed are reflected throughout the following taxonomy.
    - (U) (\$157) Manufacturing and Engineering Systems: Completed work on STEP Conformance Testing.
    - (U) (\$14,500) Composites and Processing Fabrication: Initiated Phase I of the Composites Affordability Initiative. Continued Rapid Response projects, Resin Transfer Molding, Composites Shipboard Electronic Cabinets, Composite Ventilation Ducting for Shipboard Applications, Carbon-Carbon Manufacturing Improvement, and Z-Direction Reinforcement for Composite Laminates. Completed Manufacturing Technology for Composites Marine Control Surfaces, Advanced Fiber Placement (Phase II), In-Situ Fiber Placement, Low Observable Honeycomb Core Manufacturing and Injection Molded Thermoplastic Composite Bearing Cages.
    - (U) (\$19,127) Electronics Processing and Fabrication: Initiated the following electro-optics projects: Sapphire Dome Coatings, Diode Pump Erbium Glass Laser Range Finders, Low Cost Manufacture of Infrared Focal Plane Arrays, Fiber Optic Velocity Sensor Manufacturing, and Manufacture Automation of Monolithic Ring Gyros. Continued Diamond Film Packaging for Transmit/Receive Modules, Simulation and Modeling for Electronically Steerable Arrays, Enhanced Fault Isolation, Flexible Manufacturing of Microwave Vacuum Electronic Devices. Continued manufacturing work on the Power Electronics Building Block program.
    - (U) (\$37,561) Metals Processing and Fabrication: Completed final documentation on the Cast Ductile Iron Projectiles and Bombs efforts and terminated both contracts. Continued Condition Based Maintenance, Gear Hob Wear/Breakage Monitoring, Marine Corps Rotocraft, Cutting Tools Coatings, Net Shape Finishing of Gears by Ausforming and Laser Processing of Nickel Aluminum. Accelerated the Spray Metal Forming project supporting the Joint Strike Fighter Office. Continued Titanium Welding, Weld Fumes, Weld Residual Stress

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Budget Item Justification  
(Exhibit R-2, page 3 of 11)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0708011N      PROJECT NUMBER: R1050  
PROGRAM ELEMENT TITLE: Manufacturing Technology      PROJECT TITLE: Manufacturing Technology  
Development

and Distortion, and the Programmable Automated Welding System projects. Completed Superplastic Forming of Aluminum Aircraft Assemblies, Advanced Optimized Weldment Properties, and Knowledge Integrated Solution Heat Treatment Process for Turbine Engines. Completed Development of Hot Isostatic Pressing Modeling System for Large Complex Parts, Powder Injection Molding of Naval Weapon Systems, Optimized Atomization of Magnesium Power and Computer Prediction of Hot Tears and Hot Cracks in Precision Casting. Continued Semi Solid Forming Technology for Titanium Fluid Handling Components, Centrifugally Cast Titanium Bronze Components, and Commercialization of Advanced Welding Consumables.

- (U) (\$10,120) Advanced Industrial Practices: Continued identification of best management and manufacturing practices to be utilized in achieving acquisition reform. Continued enhancements of the Program Managers Workstation and updated as needed. Continued Program Managers Workstation courses at Defense Systems Management College. Continued the identification of environmental best practices for use in partnership with Environmental Protection Agency, University of Maryland and White House Environmental Office. Continued Shock Reduction of Hull Planing Boats, Research in Shipboard Sensors, Integrating Fire-Tolerant Design and Fabrication of Composite Ship Structures, Motion Sickness and Anti-Motion Sickness Treatment, and the Environmental Resource Information Center in support of the MANTECH shipbuilding initiatives. Initiated a new shipbuilding effort entitled Supply Chain Integration.
  - (U) (\$13,110) Other: Finished Phase II of Spray Metal Forming project. Completed manufacturing effort on the Transmit Receive Modules for the Cooperative Engagement Capabilities program. Continued repair technology rapid response projects, Ball Valve Repair Process Improvement, Shearography System Development in support of the depots and shipyards. Continued Low Cost Charge Munitions Manufacturing. Improved Technology for Line Charge Manufacturing and Ammonium Dinitramide Manufacturing in support of energetics materials. Initiated efforts for specific technology transfer projects, and career training and assessment. Initiated the Line Charge and Shaped Charge Munitions projects supporting the U.S. Marine Corps.
2. (U) FY 1998 PLAN: (While the control amount for FY 1998 is \$53,369, the actual execution amount is \$76,045 thousand. This reflects \$22,676 of FY 1997 carryover to FY 1998.)

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Budget Item Justification  
(Exhibit R-2, page 4 of 11)

# UNCLASSIFIED

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0708011N      PROJECT NUMBER: R1050  
PROGRAM ELEMENT TITLE: Manufacturing Technology      PROJECT TITLE: Manufacturing Technology  
Development

- (U) The Navy MANTECH program executes a significant amount of its projects through the Centers of Excellence. The technical efforts performed are reflected throughout the following taxonomy:
  - (U) (\$500) Manufacturing and Engineering Systems - Complete efforts in the Computer Aided Manufacturing Engineering project.
  - (U) (\$14,000) Composites and Processing Fabrication - Continue efforts in composite shipboard electronic cabinets, continue the Composites Affordability Initiative, initiate a Topside Structure project, continue efforts with the Naval Sea Systems Command (NAVSEA) Lean Ship initiative.
  - (U) (\$9,000) Electronics Processing and Fabrication - Continue the AEGIS electronics demonstration, continue Flexible manufacturing of microwave vacuum electronic devices, continue Diamond Film Packaging for Transmit Receive Modules, continue Sapphire Dome Coatings, continue Diode Pump Erbium Glass Laser Range Finders, continue Low Cost Manufacture of Infrared Focal Plane Arrays, continue Fiber Optic Velocity Sensor Manufacturing, and continue Manufacture Automation of Monolithic Ring Gyros.
  - (U) (\$25,000) Metals Processing and Fabrication - Continue efforts in Centrifugally Cast Titanium Carbide Bronze Implements, continue Commercialization of Advanced Welding Consumables, continue Titanium Welding, continue Weld Residual Stress and Distortion, continue Modeling of Clamping Distortions and Prediction of Gear Accuracy, continue laser Processing of Nickel Aluminum Bronze, and continue Non-Contract Highspeed Gear Inspection, continue Adhesive Bondline Integrity, and continue Underwater Wet Welding.
  - (U) (\$7,500) Advanced Industrial Practices - Continue efforts in identifying best commercial practices to be incorporated into the Acquisition Reform regime. Initiate efforts to establish a strong linkage between the Best Manufacturing Practices program and the Acquisition Center of Excellence. Initiate efforts with NAVSEA to support the Lean Ship Initiative. Recompete the Gulf Coast Region Maritime Technology Center in order to continue shipbuilding efforts such as Non-Toxic Pigment Substitute for Chromium in Primer for Aluminum Substrates, continue Simulation Based Design initiatives, continue Environmental Resource Information Center, continue Research in Shipboard Sensors and continue Effective Aluminum Catamaran Structure Extrusions.

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Budget Item Justification  
(Exhibit R-2, page 5 of 11)

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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0708011N      PROJECT NUMBER: R1050  
PROGRAM ELEMENT TITLE: Manufacturing Technology      PROJECT TITLE: Manufacturing Technology  
Development

-- (U) (\$20,045) Other - Continue projects in the repair technology arena that support the depots and shipyards such as Supercritical CO2 Parts Cleaning, Ball Valve Repair Process Improvement, Shearography System Development, and Reverse and Re-Engineering Technical Data Generation System. Continue the Ammonium Dinitramide and Composite Propellants projects in support of energetic materials. Continue enhancing technology transfer efforts at the Technology Transfer Center. Continue Phase III of the F414 Engine Demonstration Device with General Electric. Continue Production Tooling for Concept 1 Payload in support of Surface Ship Torpedo Defense. Initiate research efforts in support of the Advanced Shipbuilding Enterprise. Continue efforts in Propulsor Encapsulation.

3. (U) FY 1999 PLAN:

- (U) (\$59,060) High priority projects will fall within the three top areas: Composites, Electronics and Metalworking.
  - (U) (\$12,000) Composites Processing and Fabrication - Continue work on the Composites Affordability Initiative, the Composites Electronic Housing, Resin Transfer Molding, KOREX, Z-Direction Reinforcement for Composite Laminates, Fiber Steering for Lightweight Affordable Composite Structures, Teaching Factory and Rapid Response projects; and initiate a new project for Ship Topside Structure Demonstration.
  - (U) (\$10,000) Electronics Processing and Fabrication - Continue AEGIS Electronic Demonstration, Flexible Manufacturing of Microwave Power Module Manufacturing, Learning Center and Demonstration Factory, and the Power Electronic Building Blocks Manufacturing plan. Continue electro-optics efforts in Sapphire Domes, Manufacturing Automation of Monolithic Ring Gyros; and initiate efforts for Fiber Optic Velocity Sensors, Remote Source Lighting Technology, Conformal Acoustic Velocity Sensor Accelerometer Manufacturing, RF Photonics for Multi-Function Phased Array Antennas, and Affordable Array Technology Tooling.
  - (U) (\$21,000) Metals Processing and Fabrication - Continue the following metalworking projects: Verification of Advanced Welding Consumables, Centrifugally Cast Titanium/Chromium Bronze Components, Neodymium Ribbon Development, Optimized Atomization of Magnesium Powder, Titanium Alloy Hearth Melting Processing Technology, Optimized High Strength Lightweight Alloy Welding, and Thin Wall Superalloy Structural Castings. Terminate Powder Metallurgy and Materials Initiative. Continue the following joining projects: Weld Residual Stress and Distortion, Titanium Welding, Adhesive Bonding Integrity, Gas Tungsten

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Budget Item Justification  
(Exhibit R-2, page 6 of 11)

# UNCLASSIFIED



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FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0708011N      PROJECT NUMBER: R1050  
PROGRAM ELEMENT TITLE: Manufacturing Technology      PROJECT TITLE: Manufacturing Technology  
Development

Arc Welding Flux for Increased Penetration, Knowledge Based Ultrasonic Testing of Welds, and continue rapid response actions. Continue the following materials processing initiatives: Laser Processing of Nickel Aluminum Bronze, Non-Contact High Speed Gear Inspection, Repair/Refurbishment of Fatigue/Wear Limited Navy Structures, Advanced Manufacturing Processes for the Advanced Amphibious Assault Vehicle, and Manufacturing of High Performance of Transmission Housing.

- (U) (\$7,500) Advanced Industrial Practices - Continue enhancing the linkage between Best Manufacturing Practices and Acquisition Reform. Continue documenting environmental manufacturing and business practices. Continue efforts in shipbuilding and simulation based design.
- (U) (\$8,560) Other - Continue projects in the repair technology arena that support the depots and shipyards such as Supercritical CO2 Parts Cleaning, Ball Valve Repair Process Improvement, Shearography System Development, and Reverse and Re-Engineering Technical Data Generation System. Continue the Ammonium Dinitramide and Composite Propellants projects in support of energetic materials. Continue enhancing technology transfer efforts at the Technology Transfer Center. Continue Phase III of the F414 Engine Demonstration Device with General Electric. Continue Production Tooling for Concept 1 Payload in support of Surface Ship Torpedo Defense. Initiate research efforts in support of the Advanced Shipbuilding Enterprise. Continue efforts in Propulsor Encapsulation.

## B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
(U) FY 1998 President's Budget:	84,397	0	35,348
(U) Appropriated Value:	-	55,000	-
(U) Adjustments from FY 1998 PRESBUDG:	-4,546	+53,369	+23,712
(U) FY 1999 President's Budget Request:	79,851	53,369*	59,060

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Budget Item Justification  
(Exhibit R-2, page 7 of 11)

# UNCLASSIFIED

# UNCLASSIFIED

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1998

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0708011N      PROJECT NUMBER: R1050  
PROGRAM ELEMENT TITLE: Manufacturing Technology      PROJECT TITLE: Manufacturing Technology  
Development

\* \$22,676 thousand of FY 1997 carryover funding being utilized in addition to \$53,369 thousand appropriated.

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1997 adjustment is due to SBIR assessment (-2,218), revised economic assumptions (-103), reprogramming for Southeast Regional Network (-2,300) and update to reflect actual execution (+75). FY 1998 adjustment is due to a Congressional increase (+55,000), Congressional Undistributed reductions (-1,509) and economic assumptions (-122). FY 1999 increase reflects decision to level fund the program in FY 99 and out at \$60 million per year (+24,652), Navy Working Capital Fund (NWCF) surcharge correction (+106), other NWCF adjustments (-21), inflation adjustment (-1,042) and other minor adjustments (+17).

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

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

(U) RELATED RDT&E: Not applicable.

D. (U) SCHEDULE PROFILE: Not applicable.

R-1 Line Item 188

Budget Item Justification  
(Exhibit R-2, page 8 of 11)

# UNCLASSIFIED

# UNCLASSIFIED

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

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0708011N

PROJECT NUMBER: R1050

PROGRAM ELEMENT TITLE: Manufacturing Technology  
Development

PROJECT TITLE: Manufacturing Technology

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

Project Cost Categories	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
a. Process Development	88,159	65,300	55,000
b. Program Management Support	6,416	10,745	4,060
Total	94,575*	76,045**	59,060

\*Reflects FY 1997 actual execution. This includes \$37,400 thousand of FY 1996 carryover and \$57,175 thousand in FY 1997 funds.

\*\* \$22,676 thousand of FY 1997 carryover being utilized in FY 1998 in addition to \$53,369 thousand appropriated.

R-1 Line Item 188

RDT&E PE/Project Cost Breakdown  
(Exhibit R-3, page 9 of 11)

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

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0708011N

PROJECT NUMBER: R1050

PROGRAM ELEMENT TITLE: Manufacturing Technology  
Development

PROJECT TITLE: Manufacturing Technology

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

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development										
GLCC	C/BAA	1995	CONT.	CONT.	72,928	14,000	14,000	12,000	CONT.	CONT.
CTC	SS/CPFF	1988	CONT.	CONT.	148,495	27,000	17,000	15,000	CONT.	CONT.
EWI	C/BAA	1996	CONT.	CONT.	5,000	3,100	3,500	3,000	CONT.	CONT.
ACI	C/BAA	1995	CONT.	CONT.	3,500	7,668	7,275	6,000	CONT.	CONT.
UNO	C/BAA	1994	CONT.	CONT.	27,235	6,000	4,360	4,000	CONT.	CONT.
PSU	C/CPFF	1992	CONT.	CONT.	35,820	4,900	7,000	3,000	CONT.	CONT.
BFTC	C/CA	1994	CONT.	CONT.	750	10,518	1,000	4,000	CONT.	CONT.
PTI	C/CPFF	1996	CONT.	CONT.	19,841	4,500	5,000	4,000	CONT.	CONT.
NSWC-CD	WX	1996	UNK	UNK	UNK	2,045	2,027	2,000	CONT.	CONT.
NSWC-IN	WX	1995	UNK	UNK	UNK	3,400	3,000	2,000	CONT.	CONT.
NAWC-WD	WX	1996	UNK	UNK	UNK	1,200	1,275	900	0	UNK
IPI	C/CPFF	1995	UNK	UNK	4,274	2,700	3,000	0	0	9,974
Miscellaneous						7,544	7,608	3,160	CONT.	CONT.

Support and Management: Not applicable.

Test and Evaluation: Not applicable.

GOVERNMENT FURNISHED PROPERTY: Not applicable.

R-1 Line Item 188

RDT&E PE/Project Cost Breakdown  
(Exhibit R-3, page 10 of 11)

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# UNCLASSIFIED

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

DATE: February 1998

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0708011N

PROJECT NUMBER: R1050

PROGRAM ELEMENT TITLE: Manufacturing Technology  
Development

PROJECT TITLE: Manufacturing Technology

	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Subtotal Product Development	317,843	94,575	76,045	59,060	CONT.	CONT.
Subtotal Support and Management	0	0	0	0	0	0
Subtotal Test and Evaluation	0	0	0	0	0	0
Total Project	317,843	94,575	76,045	59,060	CONT.	CONT.

R-1 Line Item 188

RDT&E PE/Project Cost Breakdown  
(Exhibit R-3, page 11 of 11)

# UNCLASSIFIED