DEPARTMENT OF THE NAVY
FY 1999 BUDGET ESTIMATES

JUSTIFICATION OF ESTIMATES

RESEARH, DEVELOPMENT, TEST & EVALUATION
BUDGET ACTIVITY 7: OPERATIONAL SYSTEMS DEVELOPMENT

SEPTEMBER 1997

Department of the Navy
FY 1998/1999 RDT&E Program

Exhibit R-1

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

DATE: September 1997

R-1 Line Number	Program Element Number	Item Nomenclature	Budget Activity	Millions of Dollars FY 1997	FY 1998	FY 1999	Security Classification
145	0101221N	Strategic Sub & Weapons System Support	7	31.854	44.419	53.544	U
146	0101224N	SSBN Security/Survivability Program	7	22.657	24.726	34.190	U
		(R2/R3 Materials provided in Classified Budget Book)					
147	0101226N	Sub Acoustic Warfare Dev	7	7.391	6.058	8.454	U
148	0204136N	F/A-18 Squadrons	7	402.847	316.976	362.740	U
149	0204152N	E-2 Squadrons	7	60.015	64.852	48.509	U
150	0204163N	Fleet Communications	7	17.797	16.927	17.463	U
150A	0204227N	Harpoon Modifications	7	-	-	2.000	
151	0204229N	Tomahawk & TMPC	7	138.821	93.359	65.809	U
152	0204311N	Integrated Surveillance System	7	33.132	9.882	21.116	U
153	0204413N	Amphib Tactical Support Units	7	1.442	0.672	1.981	U
154	0204571N	Consolidated Training Systems Development	7	43.234	59.189	21.939	U
155	0204575N	EW Readiness Support	7	1.240	1.626	3.781	U
156	0205601N	HARM Improvement	7	35.783	6.169	8.212	U
157	0205604N	Tactical Data Links	7	34.695	41.375	51.401	U
158	0205620N	Surface ASW Combat Sys Integration	7	6.412	7.991	9.533	U
159	0205632N	MK 48 ADCAP	7	11.627	10.786	17.802	U
160	0205633N	Aviation Improvements	7	50.794	60.025	65.940	U
161	0205658N	Navy Science Assistance Program	7	15.534	-	-	U
		(Prior Year Only -- R2/R3 Not Required)					
162	0205667N	F-14 Upgrade	7	9.377	11.704	13.060	U
163	0205675N	Operational Nuclear Power Systems	7	54.825	55.998	55.138	U
		(R2/R3 Materials provided in Classified Budget Book)					
164	0206313M	Marine Corps Communications	7	53.850	35.641	51.475	U
165	0206623M	MC Ground Combat/Spt Arms Sys	7	9.589	12.386	14.954	U
166	0206624M	MC Combat Services Support	7	7.993	5.048	4.748	U
167	0207161N	Tactical Air Intercept	7	45.321	60.079	66.877	U
168	0207163N	AMRAAM	7	2.128	5.700	4.911	U
169	0303906N	Aquarius	7	-	-	-	U
		(Classified -- Material Not Available)					

170	0303901N	Sirius	7	-	-	-	U
		(Classified -- Material Not Available)					
171	0303109N	Satellite Communications (Space)	7	32.046	17.026	18.621	U
172	0303140N	Information Systems Security Plan	7	22.760	20.291	22.955	U
173	0303150N	Global Command and Control	7	-	0.498	0.477	U
174	0303905N	Pisces	7	-	-	-	U
		(Classified -- Material Not Available)					
175	0303907N	Capricorn	7	-	-	-	U
		(Classified -- Material Not Available)					
176	0305160N	Def Meteorological Satellite Prog (Space)	7	16.759	6.865	10.479	U
177	0305192N	Joint Military Intelligence Program	7	-	2.412	2.302	U
178	0305207N	DARP, Special Project Aircraft	7	-	0.344	0.342	U
		(Classified -- Material Not Available)					
179	0305927N	Navy Space Surv	7	0.658	0.399	0.407	U
180	0708011N	Industrial Preparedness	7	84.241	-	60.126	U
		Total Operational Systems Development		1,254.822	999.423	1,121.286	

UNCLASSIFIED

Department of the Navy
FY 1998/1999 RDT&E Program
Alphabetic Listing

Exhibit R-1

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

DATE: September 1997

R-1 Line Number	Program Element Number	Item Nomenclature	Budget Activity	Millions of Dollars FY 1997	FY 1998	FY 1999	Security Classification
153	0204413N	Amphib Tactical Support Units	7	1.442	0.672	1.981	U
168	0207163N	AMRAAM	7	2.128	5.700	4.911	U
169	0303906N	Aquarius	7	-	-	-	U
		(Classified -- Material Not Available)					
160	0205633N	Aviation Improvements	7	50.794	60.025	65.940	U
175	0303907N	Capricorn	7	-	-	-	U
		(Classified -- Material Not Available)					
154	0204571N	Consolidated Training Systems Development	7	43.234	59.189	21.939	U
184	0305889N	Counter Drug RDTEN Projects	7	-	-	-	U
		(Prior Year Only -- R2/R3 Not Required)					
178	0305207N	DARP, Special Project Aircraft	7	-	0.344	0.342	U
		(Classified -- Material Not Available)					
176	0305160N	Def Meteorological Satellite Prog (Space)	7	16.759	6.865	10.479	U
149	0204152N	E-2 Squadrons	7	60.015	64.852	48.509	U
155	0204575N	EW Readiness Support	7	1.240	1.626	3.781	U
162	0205667N	F-14 Upgrade	7	9.377	11.704	13.060	U
148	0204136N	F/A-18 Squadrons	7	402.847	316.976	362.740	U
150	0204163N	Fleet Communications	7	17.797	16.927	17.463	U
173	0303150N	Global Command and Control	7	-	0.498	0.477	U
156	0205601N	HARM Improvement	7	35.783	6.169	8.212	U
150A	0204227N	Harpoon Modifications	7	-	-	2.000	
180	0708011N	Industrial Preparedness	7	84.241	-	60.126	U
172	0303140N	Information Systems Security Plan	7	22.760	20.291	22.955	U
152	0204311N	Integrated Surveillance System	7	33.132	9.882	21.116	U
177	0305192N	Joint Military Intelligence Program	7	-	2.412	2.302	U
164	0206313M	Marine Corps Communications	7	53.850	35.641	51.475	U
166	0206624M	MC Combat Services Support	7	7.993	5.048	4.748	U
171	0206626M	MC Command/Control/Communic Sys	7	-	-	-	U
		(Prior Year Only -- R2/R3 Not Required)					

165	0206623M	MC Ground Combat/Spt Arms Sys	7	9.589	12.386	14.954	U
170	0206625M	MC Intell/Elect Warfare System	7	-	-	-	U
		(Prior Year Only -- R2/R3 Not Required)					
159	0205632N	MK 48 ADCAP	7	11.627	10.786	17.802	U
161	0205658N	Navy Science Assistance Program	7	15.534	-	-	U
		(Prior Year Only -- R2/R3 Not Required)					
179	0305927N	Navy Space Surv	7	0.658	0.399	0.407	U
150	0101402N	Navy Strategic Communications	7	-	-	-	U
		(Prior Year Only -- R2/R3 Not Required)					
163	0205675N	Operational Nuclear Power Systems	7	54.825	55.998	55.138	U
		(R2/R3 Materials provided in Classified Budget Book)					
174	0303905N	Pisces	7	-	-	-	U
		(Classified -- Material Not Available)					
171	0303109N	Satellite Communications (Space)	7	32.046	17.026	18.621	U
170	0303901N	Sirius	7	-	-	-	U
		(Classified -- Material Not Available)					
146	0101224N	SSBN Security/Survivability Program	7	22.657	24.726	34.190	U
		(R2/R3 Materials provided in Classified Budget Book)					
145	0101221N	Strategic Sub & Weapons System Support	7	31.854	44.419	53.544	U
147	0101226N	Sub Acoustic Warfare Dev	7	7.391	6.058	8.454	U
158	0205620N	Surface ASW Combat Sys Integration	7	6.412	7.991	9.533	U
167	0207161N	Tactical Air Intercept	7	45.321	60.079	66.877	U
157	0205604N	Tactical Data Links	7	34.695	41.375	51.401	U
151	0204229N	Tomahawk & TMPC	7	138.821	93.359	65.809	U
		Total Operational Systems Development		1,254.822	999.423	1,121.286	

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN Date: Sept 1997

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	9,446	10,993	10,149	9,268	7,621	7,840	1,314	CONT.	CONT.
S0004 TRIDENT Submarine System Improvement	1,548	4,729	7,542	2,240	0	1,515	1,535	CONT.	CONT.
J2228 Technology Applications Program	20,860	28,697	35,853	38,899	41,135	42,209	43,376	CONT.	CONT.
TOTAL	31,854	44,419	53,544	50,407	48,756	51,564	46,225	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.

Exhibit R-2

FY 1999 PROGRAM ELEMENTS/PROJECT COST BREAKDOWN

Date: Sept 1997

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	9,446	10,993	10,149	9,268	7,621	7,840	1,314	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.

Exhibit R-2

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

Date: Sept 1997

BUDGET ACTIVITY: 7

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

PROJECT NUMBER: J0951
PROJECT TITLE: TRIDENT II

(U) PROGRAM ACCOMPLISHMENTS AND PLANS

1. (U) FY 1997 PLAN:

- (U) ($7,446) SRS: Effort continues in support of phase three development of the SLBM Retargeting System.
- (U) ($2,000) TRIDENT COST OF OWNERSHIP REDUCTION INITIATIVES: Continue the solid missile models for the Virtual Prototype System (VPS) and continue development of distributed computing methodologies and design tool linkages. Continue the advanced Non Destructive Test (NDT) development efforts with the acquisition of prototype NDT equipments and perform initial studies on full scale test articles. Continue the reduced costs manufacturing concepts project for Post Boost Control System (PBCS) replacement components, electronic and other missile components with small scale component design, manufacture and test.

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 3rd quarter of the 1st year.
- (U) ($1,993) TRIDENT COST OF OWNERSHIP REDUCTION INITIATIVES: Full obligation is projected by 3rd quarter of the 1st 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) ($9,178) SRS: Effort continues in support of phase three development of the SLBM Retargeting System. Full obligation is projected by 3rd quarter of 1st year.
- (U) ($ 971) This represents funding utilized to finance closed account contract billings.

Exhibit R-2

FY 1999 RDT&E,N PROGRAM ELEMENTS/PROJECT COST BREAKDOWN Date: Sept 1997

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:

	FY 1997	FY 1998	FY 1999
(U) FY 1998 President's Budget	12,333	10,993	9,178
(U) Adjustments from FY 1998 PRESBUDG:	(-)2,887	0	971
(U) FY 1999 OSD/OMB Budget:	9,446	10,993	10,149

(U) CHANGE SUMMARY EXPLANATION: FY 1997 changes result from an enacted below threshold reprogramming ($-2,200) and miscellaneous NWCF and other pricing adjustments ($-687). FY 1999 increase results from a PR-99 adjustment for Closed Account Bills ($+1,000) and miscellaneous NWCF and other pricing adjustments ($-29).

(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
314,277	339,269	318,823	514,217	533,561	552,399	494,352	1,277,800	4,344,698

WPN LI 2+3

(U) RELATED RDT&E: N/A

D. (U) SCHEDULE PROFILE: Not Applicable.

Exhibit R-2

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	FY 1997	FY 1998	FY 1999
a. Strategic Retargeting System	7,446	9,000	9,178
b. TRIDENT Cost of Ownership Initiative	2,000	1,993	0
c. Closed Account Contract Billings	0	0	971
Total	9,446	10,993	10,149

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	3,400	3,400		3,400			0	3,400
LMMS	SS/CPFF	10/96	1,800	1,800		1,800				1,800
LMMS	SS/CPFF	2/96	4,954	4,954	4,954				0	4,954
LMMS*	SS/CPFF	6/97	200	200		200			0	200
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	1,993			1,993		0	1,993
GDEB	SS/CPFF	3/95	1,428	1,428	1,428				0	1,428

*$.2 million was deferred until June 1997.

Exhibit R-3

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

Date: Sept 1997

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

Item Description	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Total Delivery Date	FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
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		4,046			0	4,046
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				971	0	971
Support and Management									
Test and Evaluation									
Total									

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

Exhibit R-3

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

Date: Sept 1997

BUDGET ACTIVITY: 7

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

PROJECT NUMBER: J0951
PROJECT TITLE: TRIDENT II

C. (U) FUNDING PROFILE:
C. 1. (U) FISCAL YEAR OBLIGATION/EXPENDITURE ACTUALS AND PLANS (BY QUARTER) ($ in thousands)

		FY 1997		FY 1998		FY 1999	
Funds Profile		Oblig	Expend	Obilg	Expend	Oblig	Expend
FY 1997	1Q ACT	6,000	200				
	2Q ACT	9,037	717				
	3Q ACT	9,246	3,359				
	4Q EST	9,446	5,195				
FY 1997	TOTAL	9,446	5,195				
FY 1998	1Q EST		876	4,837	220		
	2Q EST		1,673	7,745	440		
	3Q EST		2,470	10,993	3,298		
	4Q EST		3,117	10,993	6,046		
FY 1998	TOTAL		3,117	10,993	6,046		
FY 1999	1Q EST		246		880	4,453	202
	2Q EST		496		1,759	6,882	404
	3Q EST		738		2,748	10,149	3,036
	4Q EST		1,134		3,628	10,149	5,566
FY 1999	TOTAL		1,134		3,628	10,149	5,566
FY 2000	1Q EST				330		810
	2Q EST				660		1,620
	3Q EST				990		2,531
	4Q EST				1,319		3,340
FY 2000	TOTAL	0	0	0	1,319	0	3,340
FY 2001	1Q EST						303
	2Q EST						606
	3Q EST						909
	4Q EST						1,243
FY 2001	TOTAL	0	0	0	0	0	1,243
TOTAL OF FY FUNDS		9,446	9,446	10,993	10,993	10,149	10,149

Date: Sept 1997

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0101221N

PROGRAM ELEMENT TITLE: Strategic Submarine and Weapon Systems Support

PROJECT NUMBER: J0951

PROJECT TITLE: TRIDENT II

C. 2. (U) FY 1997 OBLIGATIONS/EXPENDITURES ($ in thousands)

	TOTAL AVAILABLE FUNDS	FIRST YEAR OBLIGATIONS ($000)	%	FIRST YEAR EXPENDITURES ($000)	%
FY 1997 ACTUAL THRU July *	9,446	9,037	96%	3,359	36%

EXPLANATIONS OF LOW OBLIGATIONS OR EXPENDITURES:

* The SSP RDT&EN program for FY 1997 is near 100% obligated. Repeated external reductions to budgeted TOA have forced contract award delays as well as modifications. Navy expenditure end of year target is anticipated to be met.

Exhibit R-3

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

Date: Sept 1997

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	20,860	28,697	35,853	38,899	41,135	42,209	43,376	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.

Exhibit R-2

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) ($11,588) Continue Reentry System Applications Program. FY 1997 efforts include:

(U) Select and prepare flight test on-board instrumentation for measurement of nosetip recession.

(U) Manufacture selected ground test nosetip and heatshield replacement material specimens.

(U) Update 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) Evaluate reentry vehicle ground test and flight test data for aging related trends.

(U) Define and test instrumentation to support reentry vehicle service life extension and accuracy maintenance assessments.

(U) Continue tasks initiated in FY 1996 in response to the results of the readiness application assessment.

(U) Continue 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) ($ 9,272) Continue Strategic Guidance Applications Program. FY 1997 efforts include:

(U) Adapt and enhance 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) Continue 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 Inteferometic 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.

BUDGET ACTIVITY: 7

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

PROJECT NUMBER: J2228
PROJECT TITLE: Technology Applications

2. (U) FY 1998 Plan

- (U) ($15,706) 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.

  (V) Develop program plan and initiate testing on new & aged reentry materials exposed to operational environments and assess impact to system performance which includes accuracy.

  (U) Maintain Technical Program Plan.

  (U) Continue development of instrumentation for flight test applications.

  (U) Continue, as required, the application of analytical method areas defined by the results of the readiness application assessment completed in FY 1997.

Exhibit R-2

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

Date: Sept 1997

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0101221N
PROGRAM ELEMENT TITLE: Strategic Submarine and

PROJECT NUMBER: J2228
PROJECT TITLE:

Weapon Systems Support Technology Applications

- (U) ($12,991) 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 which should be attained in early FY 1999. Continue expanding the hardware design support of SIGHTS into other subsystems such as attitude and stellar and their associated hardware correlation. SIGHTS will continue development towards having a laboratory Inertial Measurement Unit (IMU) design complete by the end of FY 1998. Deliver and begin utilization of the "probes" initiated in FY 1997.

  (U) Continue the prototype/design tradeoff effort for the next generation PIGA towards a Critical Design Review (CDR) at the end of FY 1998. The review of alternate accelerometer efforts/technologies and the status of the next generation PIGA will go through down select to one or more technologies to be pursued with eventual evaluation in SIGHTS. Complete the radiation testing of IFOG technology and pursue technology alternatives for deficiencies. Continue to pursue alternatives for the current TRIDENT II gyro to improve its anticipated reliability. Depending on stellar sensor performance under the FY 1997 task, possible procurement of sensors adapted to a TRIDENT II format. If FY 1997 stellar sensor task meets with failure, pursue alternate technologies. Select one or more of the alternate designs from the Rad Hard electronics task for hardware implementation. Continue to look at other alternatives for the Rad Hard electronics issue.

3. (U) FY 1999 Plan

- (U) ($19,830) Continue reentry system applications program. Full obligation is projected by the 3rd quarter of the 1st year. FY 1999 efforts include:

  (U) Conduct limited ground testing of candidate nosetip & heatshield replacement materials.
  (U) Initiate planning for limited procurement of flight required hardware and instrumentation.
  (U) Update aging assessment methodologies with new test data collected in FY 1998.
  (U) Continue development of required instrumentation for flight test applications
  (U) Continue, as required, the application of selected analytical method areas defined by the results of the readiness assessment completed in FY 1997.

Exhibit R-2

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN Date: Sept 1997

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0101221N PROJECT NUMBER: J2228
PROGRAM ELEMENT TITLE: Strategic Submarine & PROJECT TITLE: Technology

- (U) ($16,023) Continue Strategic Guidance Applications Program. Projected obligation by 3rd quarter 1st year. FY 1999 efforts include:

  (U) Complete IEE System functionality and provide improved fidelity towards a "virtual" system capability in FY 2000. Utilize the IEE/SIGHTS capability to perform system architecture/design tradeoffs. Continue with IEE/SIGHTS towards a "real time hardware-in-the-loop simulation capability targeted for completion in late FY 2001.

  (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:

	FY 1997	FY 1998	FY 1999
(U) FY 1998 President's Budget:	27,797	28,697	38,949
(U) Adjustment from 1998 PresBud:	- 6,937	0	- 3,096
(U) FY 1999 OSD submission:	20,860	28,697	35,853

(U) CHANGE SUMMARY EXPLANATION:

(U) The FY 1997 reduction results from enacted below threshold reprogrammings, SBIR transfer and miscellaneous NWCF and other pricing adjustments. The decrease in FY 1999 is an affordability-based reduction which delays Guidance gyroscope tasks and reduces the scope of various Reentry tasks. While the key technologies will still be maintained, the reduced tasking introduces some additional, but acceptable, risk that the full application of the technology will not be realized.

(U) Schedule: N/A

(U) Technical: N/A

Exhibit R-2

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: Sept 1997

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)

TO

FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	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)

Exhibit R-2

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: Sept 1997

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0101221N PROGRAM ELEMENT TITLE: Strategic Submarine and Weapon System Support PROGRAM NUMBER: J2228 PROJECT TITLE: Technology Applications

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

Project Cost Categories	FY 1997	FY 1998	FY 1999
a. Reentry System Applications	11,588	15,706	19,830
b. Strategic Guidance Applications	9,272	12,991	16,023
Total	20,860	28,697	35,853

Exhibit R-3

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJ0CT COST BREAKDOWN Date: Sept 1997

BUDGET ACTIVITY: 7
PROGRAM ELEMENT: 0101221N
PROGRAM ELEMENT TITLE: Strategic Submarine and Weapon System Support
PROJECT NUMBER: J2228
PROJECT TITLE: Technology Applications

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

PERFORMING ORGANIZATIONS

Contractor/ Government	Contract Method/	Award/	Perform	Project	FY 1996

Performing Activity	Fund Type Vehicle	Oblig Date	Activity EAC	Office EAC	& 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	6,676	6,676		6,676			0	6,676
LMSC	SS/CPFF	1/98	9,508	9,508			9,508		0	9,508
LMSC	SS/CPFF	1/99	11,921	11,921				11,921	0	11,921
CSDL	SS/CPFF	3/96	8,215	8,215	8,215				0	8,215
CSDL	SS/CPFF	2/97	9,272	9,272		9,272			0	9,272
CSDL	SS/CPFF	10/97	12,991	12,991			12,991		0	12,991
CSDL	SS/CPFF	10/98	16,023	16,023				16,023	0	16,023

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			4,562			0	4,562
NSWC	WR	10/97				5,698		0	5,698
NSWC	WR	10/98					7,159	0	7,159
DOE	WR	10/95 - 10/98		209	350	500	750	0	1,809

Exhibit R-3

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

Date: Sept 97

BUDGET ACTIVITY: 7

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

PROJECT NUMBER: J2228
PROJECT TITLE: Technology Applications

C. (U) FUNDING PROFILE:

1. FISCAL YEAR OBLIGATION/EXPENDITURE ACTUALS AND PLANS (BY QUARTER) ($in thousands)

Funds Profile		FY 1997 Oblig	FY 1997 Expend	FY 1998 Oblig	FY 1998 Expend	FY 1999 Oblig	FY 1999 Expend
FY 1997	1Q ACT	13,594	200				
	2Q ACT	15,701	1,985				

	3Q ACT	18,864	10,492				
	4Q EST	20,860	13,000				
FY 1997	TOTAL	20,860	13,000				
FY 1998	1Q EST		1,617	12,627	574		
	2Q EST		3,234	19,514	1,148		
	3Q EST		4,851	28,697	8,609		
	4Q EST		5,357	28,697	15,783		
FY 1998	TOTAL	0	5,357	28,697	15,783		
FY 1999	1Q EST		750		2,296	15,772	717
	2Q EST		1,290		4,592	24,376	1,434
	3Q EST		1,851		7,174	35,853	10,756
	4Q EST		2,503		9,470	35,853	19,719
FY 1999	TOTAL	0	2,503	0	9,470	35,853	19,719
FY 2000	1Q EST				861		2,868
	2Q EST				1,722		5,736
	3Q EST				2,583		8,963
	4Q EST				3,444		11,828
FY 2000	TOTAL	0	0	0	3,444		11,828
FY 2001	1Q EST						1,076
	2Q EST						2,153
	3Q EST						3,229
	4Q EST			0			4,306
FY 2001	TOTAL	0	0	0	0	0	
TOTAL OF FY FUNDS		20,860	20,860	28,697	28,697	35,853	35,853

Exhibit R-3

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

Date: Sept 97

BUDGET ACTIVITY: 7

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

PROJECT NUMBER: J2228
PROJECT TITLE: Technology Applications

C. 2. (U) FY 1997 OBLIGATIONS/EXPENDITURES ($ in thousands)

Total Available Funds ($000)	First Year Obligations ($000)	%	First Year Expenditures ($000)	%

FY 1997 ACTUAL July	20,860	20,860	100%	12,707	61%

EXPLANATION OF LOW OBLIGATIONS OR EXPENDITURES: N/A

Exhibit R-3

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0101221N
PROGRAM ELEMENT TITLE: Strategic Submarine & Weapons System 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 PROGRAM
S0004 TRIDENT Submarine System Improvements	1,548	4,729	7,542	2,240	0	1,515	1,535	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.

Exhibit R-2

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

BUDGET ACTIVITY: 7
PROGRAM ELEMENT: 0101221N
PROGRAM ELEMENT TITLE: Strategic Submarine & Weapons System Support
PROJECT NUMBER: S0004
PROJECT TITLE: TRIDENT Submarine System Improvements

2. (U) FY 1998 PLAN:

- (U) ($2,725) 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) ($1,058) 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) ($3,442) Complete development of TRIDENT CCS MK2 Block IC DWS Program.
- (U) ($2,450) Continue development of ARCI Phase I/II MPP Program.
- (U) ($1,650) Continue development of Architecture Model Maintenance and COTS Technical Refresher.

Exhibit R-2

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

BUDGET ACTIVITY: 7
PROGRAM ELEMENT: 0101221N
PROGRAM ELEMENT TITLE: Strategic Submarine & Weapons System Support
PROJECT NUMBER: S0004
PROJECT TITLE: TRIDENT Submarine Systems Improvements

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1997	FY 1998	FY 1999
(U) FY 1998 President's Budget:	1,592	4,729	3,997
(U) Appropriated Value:	1,660		
(U) Adjustments to FY 1997 Appropriated Value/FY 1998 President's Budget:			
a. SBIR Transfer	-42		
b. Congressional Undistributed Reductions	-68		
c. TRIDENT Modernization		+3,525	
d. FY97 Revised Economic Assumptions	-2		
e. NWCF Adjustments		+20	
(U) FY 1999 OSD/OMB Budget Submit:	1,548	4,729	7,542

(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), Congressional Undistributed Reductions (decrease $68K), and Revised Economic Assumptions (decrease $2K). Adjustments in FY99 were the result of PR-99 realignments of outyear controls (accomplished with CNO (N87) concurrence) to support TRIDENT OER programs (increase $3,525K) and minor NWCF adjustments (increase $20K).

(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. This restructuring received OPNAV 872E sponsor concurrence.

Exhibit R-2

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

BUDGET ACTIVITY: 7
PROGRAM ELEMENT: 0101221N
PROGRAM ELEMENT TITLE: Strategic Submarine & Weapons System Support
PROJECT NUMBER: S0004
PROJECT TITLE: TRIDENT Submarine Systems Improvements

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)									
	27,403	7,499	12,966	22,349	21,352	13,242	17,495	CONT.	CONT.
• (U) OPN Line 535500/535506 (BA-4)									
	2,055	2,312	3,046	10,098	4,882	10,929	5,817	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.

Exhibit R-2

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

DATE: September 1997

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0101221N
PROGRAM ELEMENT TITLE: Strategic Submarine & Weapons System Support

PROJECT NUMBER: S0004
PROJECT TITLE: TRIDENT Submarine System Improvements

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

Project Cost Categories	FY 1997	FY 1998	FY 1999
a. Software Development	0	600	0
b. Test and Certification	30	346	2,875
c. Design/Development Engineering	1,500	3,783	4,667
d. Support and Management	18	0	0
Total	1,548	4,729	7,542

Exhibit R-3

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: September 1997

BUDGET ACTIVITY: 7
PROGRAM ELEMENT: 0101221N
PROGRAM ELEMENT TITLE: Strategic Submarine & Weapons System Support
PROJECT NUMBER: S0004
PROJECT TITLE: TRIDENT Submarine System 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										
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	4,725	4,725	0	1,500	1,058	2,167	0	4,725
NUWCDIV, Newport, RI (CCS MK2 Block 1C)										
	WR		5,225	5,225	0	0	2,725	2,500	0	5,225
NUWCDIV, 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	2,488	2,488	683	30	0	1,225	550	2,488
NUWCDIV, Newport, RI (Architecture Model)										
	WR		CONT.	CONT.			346	1,650	CONT.	CONT.

Exhibit R-3

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: September 1997

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0101221N PROJECT NUMBER: S0004
PROGRAM ELEMENT TITLE: Strategic Submarine & Weapons System Support PROJECT TITLE: TRIDENT Submarine System Improvements

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	4,383	4,667	0	22,265
Subtotal Support and Management	0	18	0	0	0	18
Subtotal Test and Evaluation	683	30	346	2,875	CONT.	CONT.
Total Project	12,398	1,548	4,729	7,542	CONT.	CONT.

Exhibit R-3

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

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	6,058	8,454	6,638	3,803	4,972	5,860	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. Submarine Regional Warfare Missile (SRWM) 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.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0101226N
PROGRAM ELEMENT TITLE: Submarine Acoustic Warfare Development
PROJECT NUMBER: V1265
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) ($6,058) 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) ($1,487) Perform WAF analysis. Perform system analysis and prototyping for NGCM including SMTD, Submarine High Speed Offensive Countermeasure (SHOCM) and Smart Adaptive Countermeasure (SACM).

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

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:

	FY 1997	FY 1998	FY 1999
(U) FY 1998 President's Budget:	7,548	6,058	8,348
(U) Appropriated Value:	7,917		
(U) Adjustments to FY 1997 Appropriated Value/FY 1998 President's Budget:			
a. FY97 SBIR Transfer	-148		
b. Congressional Undistributed Reductions	-369		
c. FY97 Supplemental - Revised Economic Assumptions	-9		
d. NWCF Adjustments			+106
(U) FY 1999 OSD/OMB Budget Submit:	7,391	6,058	8,454

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

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 (-$369), SBIR transfer (-$148), and FY97 Supplemental - Revised Economic Assumptions (-9). FY 1999: NWCF adjustments (+106).

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

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

	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
OPN BLI: 2210 Submarine Acoustic Warfare Systems	6,934	4,259	8,502	12,636	11,642	14,388	22,481	CONT.	CONT.

(U) RELATED RDT&E: Not applicable.

D. (U) SCHEDULE PROFILE: See attached.

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: September 1997

BUDGET ACTIVITY: 7
PROGRAM ELEMENT: 0101226N
PROGRAM ELEMENT TITLE: Submarine Acoustic Warfare Development
PROJECT NUMBER: V1265
PROJECT TITLE: Submarine Defensive Warfare

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

Project Cost Categories	FY 1997	FY 1998	FY 1999
a. Primary Hardware Development	6,426	5,208	6,429
b. Development Test and Evaluation	100	0	610
c. Operational Test and Evaluation	0	0	565
d. Program Management Support	750	750	750
e. Travel	115	100	100
Total	7,391	6,058	8,454

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: September 1997

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 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 - 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.

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

Subtotal Support and Management - Not applicable.

Subtotal Test and Evaluation - Not applicable.

Total Project

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET **DATE: September 1997**

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	51,722	47,110	98,766	132,658	102,129	41,081	16,702	0	3,106,901
E2065 F/A-18 RADAR Upgrade	20,298	2,330	0	0	0	0	0	0	290,408
E2130 F/A-18 Follow-On Variant*	330,827	267,536	219,821	147,221	27,693	6,926	6,177	0	5,643,297
E2350 F/A-18F TAC RECCE	0	0	44,153	46,053	16,853	4,553	2,053	0	113,665
TOTAL	402,847	316,976	362,740	325,932	146,675	52,560	24,932	0	9,154,271
RDT&E Articles		10							10

* An Above Threshold Reprogramming (ATR) of $26M is planned in FY98. Funding will be reprogrammed from F/A-18E/F APN-1 to the Follow-on Variant Project (E2130). This action will offset the $26M Congressional reduction to the Follow-on Variant Project.

(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 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^3I) (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^3I 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.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET **DATE: September 1997**

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									
	51,722	47,110	98,766	132,658	102,129	41,081	16,702	0	3,106,901

(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 including the Stand-Off Land Attack Missile (SLAM) Expanded Response (ER), 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. In addition, the ATFLIR has been identified as a DoD risk reserve pilot program for FY 1999, with $1.2M identified from within existing budget requirements as “risk reserve”.

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)($35,985) Continued to develop and integrate enhancements to the effectiveness, operability, and safety of the F/A-18 Weapon System (airframe, avionics, weapons, and subsystems). Continued to investigate deficiencies and develop corrective action. Continued development of PIDS for combat identification and JHMCS.
- (U)($ 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)($18,000) Commenced engineering design for integration of BOL Chaff Dispenser (LAU-138) into the F/A-18.

2. (U) FY 1998 PLAN:

- (U)($2,026) 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)($1,574) 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)($43,510) Continue development of DCS, PIDS, ATFLIR, and JHMCS.

3. (U) FY 1999 PLAN:

- (U)($6,985) 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)($1,575) 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)($39,091) Continue development of DCS, PIDS and JHMCS.

- (U)($49,915) Continue ATFLIR development. Commence development of Precision Strike Upgrade, including an Advanced Mission Computer and Displays.

- (U) ($1,200) The ATFLIR has been identified as a DoD risk reserve pilot program for FY 1999. This funding is identified from within existing budget requirements as “risk reserve”.

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1997	FY 1998	FY 1999
(U) FY 1998 President's Budget:	58,676	47,110	70,188
(U) Appropriated Value:	61,105		
(U) Adjustments from PRESBUDG:	-6,954	0	+28,578
(U) FY 1999 OSD/OMB Budget Submit:	51,722	47,110	98,766

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: The net decrease of - $6,954 thousand in FY 1997 represents a Small Business Innovation Research adjustment, revised economic adjustments of various below threshold reprogrammings and a military pay adjustment. The net increase of +$28,578 thousand in FY 1999 provides for 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.

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
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	143,148	156,213	203,315	309,201	195,418	158,063	192,320	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.

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN **DATE: September 1997**

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	FY 1997	FY 1998	FY 1999
a. Contracts	30,401	21,749	53,157
b. In-House	15,904	17,923	30,453
c. Test & Evaluation	5,417	7,438	15,156
Total	51,722	47,110	98,766

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN **DATE: September 1997**

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										
MDA	SS/CPFF/FFP	3,7,9/93	1,565	1,565	1,565	0	0	0	0	1,565
MDA St. Louis, MO	SS/CPFF/FFP	12/93	101,690	101,690	50,599	15,389	7,872	18,460	9,370	101,690
Rockwell-Collins Cedar Rapids, IA	SS/FFP	7/96	16,196	16,196	6,000	7,244	2,952	0	0	16,196
MDA (ATFLIR)	CPIF/AF	12/97	TBD	128,699	0	0	10,925	32,553	85,221	128,699
MDA (Precision Strike)	TBD	11/98	TBD	85,125	0	0	0	2,144	82,981	85,125
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	7,313	7,313	0	2,000	2,150	1,855	1,308	7,313
NAWC China Lake	WX	11/98	143,957	143,957	19,223	10,406	12,603	26,293	75,432	143,957
Other Field Activities	WX	11/98	10,888	10,888	672	1,733	2,095	1,230	5,158	10,888
Support and Management										
Field Activities	Var	11/98	11,294	11,294	3,354	1,765	1,075	1,075	4,025	11,294
Test and Evaluation NAWC Pax River	WX	11/98	77,383	77,383	20,297	5,417	7,438	15,156	29,075	77,383

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN **DATE: September 1997**

BUDGET ACTIVITY: 7 **PROGRAM ELEMENT: 0204136N** **PROJECT NUMBER: 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					

	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Subtotal Product Development	81,778	44,540	38,597	82,535	259,470	506,920
Subtotal Support and Management	3,354	1,765	1,075	1,075	4,025	11,294
Subtotal Test and Evaluation	20,297	5,417	7,438	15,156	29,075	77,383
FY92 & Prior 2,511,304						2,511,304
Total Project 2,511,304	105,429	51,722	47,110	98,766	292,570	3,106,901

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET **DATE: September 1997**

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									
	20,298	2,330	0	0	0	0	0	0	290,408

(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^3I) Phase II Program will add improved hardware and software for all weather Reconnaissance (RECCE) strip map and spotlight modes.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET **DATE: September 1997**

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)($5,894) 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)($2,330) Conduct RUG Phase II Follow-on Test and Evaluation.

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

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1997	FY 1998	FY 1999
(U) FY 1998 President's Budget:	20,864	2,330	0
(U) Appropriated Value:	21,766		
(U) Adjustments from PRESBUDG:	-566	0	0
(U) FY 1999 OSD/OMB Budget Submit:	20,298	2,330	0

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY 1997 net reduction of -$566 thousand represents a Small Business Innovation Research (SBIR) adjustment, revised economic adjustments and minor program adjustments.

(U) Schedule: Not Applicable.

(U) Technical: Not Applicable.

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

	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
(U) 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	75,652	89,661	102,404	116,026	115,888	827,344	1,408,482
(U) APN-5 (RADAR)	7,784	32,236	20,012	31,735	18,332	64,089	57,650	96,663	356,510

(U) RELATED RDT&E:

(U) PE 0603261N Tactical Airborne Reconnaissance (TAC RECCE)

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET **DATE: September 1997**

BUDGET ACTIVITY: 7 **PROGRAM ELEMENT: 0204136N** **PROJECT NUMBER: E2065**
PROGRAM ELEMENT TITLE: F/A-18 SQUADRONS **PROJECT TITLE: RADAR UPGRADE**

D. (U) SCHEDULE PROFILE:

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

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN **DATE: September 1997**

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	FY 1997	FY 1998	FY 1999
a. Contracts	14,404	0	0
b. In-House	349	369	0
c. Test & Evaluation	5,545	1,961	0
Total	20,298	2,330	0

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN **DATE: September 1997**

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										
MDA (RUG PH I) St. Louis, MO	SS/LTR(FPIF)	4/90	170,903	170,903	170,903	0	0	0	0	170,903
MDA(RUG PH II)	CPIF	3/95	53,973	53,973	39,569	14,404	0	0	0	53,973
(RUG PH II)(INTEG) St. Louis, MO	CPFF	11/95	11,000	11,000	11,000	0	0	0	0	11,000
Support and Management										
In-House Support Rail Co. Towson, MD	T&M	9/94	2,243	2,243	1,525	349	369	0	0	2,243
Test and Evaluation										
NAWC China Lake	WX	N/A	36,310	36,310	31,219	3,461	1,630	0	0	36,310
COMOPTEVFOR Norfolk, VA	WX	N/A	1,800	1,800	0	1,800	0	0	0	1,800
Other Field Activities	Var	Var	5,043	5,043	4,428	284	331	0	0	5,043

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN **DATE: September 1997**

BUDGET ACTIVITY: 7 **PROGRAM ELEMENT: 0204136N** **PROJECT NUMBER: E2065**
PROGRAM ELEMENT TITLE: F/A-18 SQUADRONS **PROJECT TITLE: RADAR 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									
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					

	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Subtotal Product Development	230,608	14,404	0	0	0	245,012
Subtotal Support and Management	1,525	349	369	0	0	2,243
Subtotal Test and Evaluation	35,647	5,545	1,961	0	0	43,153
Total Project	267,780	20,298	2,330	0	0	290,408

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET **DATE: September 1997**

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
E2130 F/A-18 Follow-On Variant*									
	330,827	267,536	219,821	147,221	27,693	6,926	6,177	0	5,643,297
RDT&E Articles		10							10

* An Above Threshold Reprogramming (ATR) of $26M is planned in FY98. Funding will be reprogrammed from F/A-18E/F APN-1 to the Follow-on Variant Project (E2130). This action will offset the $26M Congressional reduction to the Follow-on Variant Project.

(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.

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U)($277,045) 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)($115,156) Continue engineering and manufacturing design activity in support of developmental flight test. Complete engine Full Production Qualification.
- (U)($25,010) Continue to develop ground test support for integration and test and evaluation. Complete DT-IIB and OT-IIA.
- (U)($120,370) 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)($111,647) Continue engineering and manufacturing design activity in support of developmental flight test. Complete DT-IID.
- (U)($21,102) Continue ground testing support for integration, test and evaluation.
- (U)($80,072) 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.

B. (U) PROGRAM CHANGE SUMMARY

	FY 1997	FY 1998	FY 1999
(U) FY 1998 President's Budget:	343,175	267,536	128,703
(U) Appropriated Value:	358,262		
(U) Adjustments from PRESBUDG:	-12,348	0	+91,118
(U) FY 1999 OSD/OMB Budget Submit:	330,827	267,536	219,821

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: The net decrease of -$12,348 thousand in FY 1997 reflects a Small Business Innovation Research (SBIR) adjustment, revised economic assumptions and various below threshold reprogramming actions. The net increase of +$91,118 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, and balancing adjustments.

(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. LRIP III and FRP award dates have been accelerated as a result of acquisition reform initiatives, including concurrent negotiation of the LRIP II and LRIP III contracts. The LRIP III contract will be an option to the LRIP II contract. As a result of the OSD Low Rate Initial Production (LRIP) decision in March 1997, the Navy Program Reviews (NPRs) scheduled in FY 1998 and FY 1999 have been accelerated by one quarter.

(U) Technical: Not Applicable.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET **DATE: September 1997**

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)

	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) PROCUREMENT:									
(U) A/C QTY	12	20	30	36	42	48	48	312	548
(U) APN1	2,062,097	2,191,575	2,874,001	2,910,090	3,092,218	3,218,226	3,178,679	20,939,736	40,700,257
(U) APN6	80,920	81,242	120,388	52,970	96,027	99,528	66,264	352,470	949,809

(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)

D. (U) SCHEDULE PROFILE:

	FY 1997	FY 1998	FY 1999	To Complete
Program Milestones	2Q/NPR 2Q/MS-IIIA	1Q/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	1Q/LRIP-3 Long Lead	1Q/FRP Long Lead	2Q/00 FRP

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN **DATE: September 1997**

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	FY 1997	FY 1998	FY 1999
a. Contract	199,922	180,200	115,000
b. Support Contract	4,390	1,200	1,080
c. In-House	124,725	85,436	103,341
d. GFE/Other	1,790	700	400
Total	330,827	267,536	219,821

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN **DATE: September 1997**

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										
MDA	SS/CPFF	3/92	81,785	81,785	81,785					81,785
St.Louis, MO	SS/CPIF/AF	7/92	3,877,744	3,877,744	3,403,944	129,600	151,000	106,000	87,200	3,877,744
	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	37,261	37,261	22,629	1,836	3,105	4,098	5,593	37,261

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: September 1997

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0204136N PROJECT NUMBER: E2130
PROGRAM ELEMENT TITLE: F/A-18 SQUADRONS PROJECT TITLE: FOLLOW-ON VARIANT

PERFORMING ORGANIZATIONS (CONT.):

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
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	383,794	383,794	70,713	88,646	71,538	83,250	69,647	383,794
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	1/97	36,142	36,142	23,892	3,250	2,000	5,000	2,000	36,142
Other Field Activities	Var	Var	20,462	20,462	2,831	10,409	0	7,222	0	20,462

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN **DATE: September 1997**

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	87,962	1,790	700	400	0	90,852
Support and Management				N/A					
Test and Evaluation				N/A					
Subtotal Product Development				4,495,029	222,402	192,098	123,269	114,523	5,147,321
Subtotal Support and Management				40,187	4,390	1,200	1,080	1,847	48,704
Subtotal Test and Evaluation				101,880	104,035	74,238	95,472	71,647	447,272
Total Project				4,637,096	330,827	267,536	219,821	188,017	5,643,297

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET **DATE: September 1997**

BUDGET ACTIVITY: 7 **PROGRAM ELEMENT: 0204136N** **PROJECT NUMBER: E2350**
PROGRAM ELEMENT TITLE: F/A-18 SQUADRONS **PROJECT TITLE: F/A-18F TAC RECCE**

(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	0	44,153	46,053	16,853	4,553	2,053	0	113,665
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.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET **DATE: September 1997**

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: (Not Applicable)

3. (U) FY 1999 PLAN:

- (U)($24,953) Commence design and development of F/A-18F Tactical Reconnaissance (TAC RECCE) System.
- (U)($2,200) Commence TAC RECCE System integration into the F/A-18F.
- (U)($7,300) Procure the sensors and GFE test equipment.
- (U)($9,700) Commence technical publication, support equipment, testing documentation and training plan development.

B. (U) PROGRAM CHANGE SUMMARY

	FY 1997	FY 1998	FY 1999
(U) FY 1998 President's Budget:	0	0	0
(U) Appropriated Value:	0		
(U) Adjustments from PRESBUDG:	0	0	+44,153
(U) FY 1999 OSD/OMB Budget Submit:	0	0	44,153

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: This is a new project. The net increase of +$44,153 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.

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

(U) PROCUREMENT: Included in the F/A-18E/F APN-1 funding.

(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.

D. (U) SCHEDULE PROFILE:

	FY 1997	FY 1998	FY 1999	To Complete
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

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN **DATE: September 1997**

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	FY 1997	FY 1998	FY 1999
a. Contract	0	0	31,753
b. Support Contract	0	0	1,520
c. In-House	0	0	3,580
d. GFE/Other	0	0	7,300
Total	0	0	44,153

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN **DATE: September 1997**

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	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										
TBD	SS/CPFF	10/98	59,446	59,446	0	0	0	31,753	27,693	59,446
NAWC China Lake	WX	11/98	20,048	20,048	0	0	0	2,200	17,848	20,048
Misc Field Activities	WX	11/98	2,890	2,890	0	0	0	990	1,900	2,890
Support and Management										
Misc Field Activities	WX	10/98	1,748	1,748	0	0	0	510	1,238	1,748
Test and Evaluation										
NAWC Pax River	WX	11/98	12,703	12,703	0	0	0	1,400	11,303	12,703
OPTEVFOR		11/01	3,030	3,030	0	0	0	0	3,030	3,030

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN **DATE: September 1997**

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 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	0	0	0	7,300	6,500	13,800
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	0	42,243	53,941	96,184
Subtotal Support and Management	0	0	0	510	1,238	1,748
Subtotal Test and Evaluation	0	0	0	1,400	14,333	15,733
Total Project	0	0	0	44,153	69,512	113,665

DATE: September 1997

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	60,015	39,380	10,569	4,148	6,684	6,685	6,888	0	614,491
RDT&E ARTICLES	8	1							
E2321 E-2 RADAR MODERNIZATION PROGRAM	0	25,472	37,940	21,068	34,838	35,593	0	0	154,911
TOTAL	60,015	64,852	48,509	25,216	41,522	42,278	6,888	0	769,402

(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

DATE: September 1997

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

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)

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	60,015	39,380	10,569	4,148	6,684	6,685	6,888	0	614,491
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.

DATE: September 1997

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) 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) ($25,118) 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.

DATE: September 1997

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) ($6,176) 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) ($4,010) Complete test aircraft modifications.

3. (U) FY 1999 PLAN:

- (U) ($5,497) 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:

	FY 1997	FY 1998	FY 1999
(U) FY 1998 President's Budget:	62,012	39,380	10,266
(U) Appropriated Value:	65,025		
(U) Adjustments from PRESBUDG:	-1,997	0	+303
(U) FY 1999 NAVCOMPT Budget Submit:	60,015	39,380	10,569

DATE: September 1997

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) The FY 1997 decrease reflects Small Business Innovation Research adjustments of -$1,505 thousand and other minor program adjustments of -$492 thousand. The FY 1999 adjustment of +$303 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)

	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
APN 1/E-2C LI #10 & 11	295,400	251,455	229,739	312,036	279,966	347,607	260,362	366,614	2,883,539
APN 5/E-2C LI #34	27,059	49,073	93,145	78,403	48,552	67,624	55,841	CONTINUED	CONTINUED
APN 6/E-2C LI #48	2,007	6,313	20,487	10,640	4,229	2,785	5,709	18,033	73,420

(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.

DATE: September 1997

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

D. (U) SCHEDULE PROFILE:

	FY 1997	FY 1998	FY 1999	TO COMPLETE
Program Milestone				1Q/00 MCU MSIII
Engineering Milestones				
T&E Milestones	2Q/3Q MCU QUAL TESTS 3Q MCU DT/OT-IIA	2Q MCU DT/0T-IIB 4Q MCU DT/OT-IIC	2Q-3Q/99 MCU TECHEVAL 3Q/99 MCU OPEVAL	2Q/00 MCU FRP
Contract Milestones	3Q MCU LRIP			

DATE: September 1997

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	FY 1997	FY 1998	FY 1999
a. Hardware/Software Development	50,581	35,123	2,902
b. Contractor Engineering Support	4,000	2,280	2,090
c. Travel	55	55	55
d. Test and Evaluation	5,379	1,922	5,522
e. SBIR Assessment			
Total	60,015	39,380	10,569

DATE: September 1997

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	17,301	17,301	12,194	0	5,107	0	0	17,301
GAC (Other)	SS/CPFF	8/95	38,303	38,303	13,898	0	0	0	24,405	38,303
Miscellaneous	SS/CPFF	12/95	671	671	671	0	0	0	0	671
GAC (Prior Yr. Efforts)	Var.	Var.	254,800	254,800	254,800					254,800
Support and Management										
NAWCAD, PAX (MCU only)	WX/RC	10/98	17,380	17,380	8,845	4,055	2,335	2,145	0	17,380
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	30,690	30,690	17,867	5,379	1,922	5,522		30,690
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

DATE: September 1997

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

	Total 1996 & Prior	FY 1997 Actual	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Subtotal Production Development	353,244	50,581	35,123	2,902	24,405	466,255
Subtotal Support and Management	67,645	4,055	2,335	2,145	0	76,180
Subtotal Test and Evaluation	59,233	5,379	1,922	5,522	0	72,056
SBIR Assessment						
Total Project	480,122	60,015	39,380	10,569	24,405	614,491

DATE: September 1997

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	25,472	37,940	21,068	34,838	35,593	0	0	154,911

(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) ($15,000) Commence advanced sensor common component design and fabrication for CMD.

- (U) ($7,322) 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) ($1,575) Flight hardware and instrumentation software development.
- (U) ($1,575) Aircraft integration design. Initiate aircraft preparation (environmental subsystems).

3. (U) FY 1999 PLAN:

- (U) ($7,450) Complete advanced sensor common component design and fabrication. Commence integration of components into applicable sensors.
- (U) ($13,556) Complete hardware and instrumentation package fabrication.
- (U) ($3,575) Complete software integration package.
- (U) ($3,575) Install aircraft integration modifications
- (U) ($6,500) Conduct RMP testing at Pacific Missile Range Facility.
- (U) ($3,284) Conduct test and evaluation of flight test and instrumentation system.

DATE: September 1997

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:

	FY 1997	FY 1998	FY 1999
(U) FY 1998 President's Budget:	0	25,472	37,881
(U) Appropriated Value:	0		
(U) Adjustments from Pres Budget:	0	0	+59
(U) FY 1998 President's Budget Submit:	0	25,472	37,940

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY 1999 adjustment of +$59 thousand reflects Navy Working Capital Fund 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)

DATE: September 1997

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	FY 1997	FY 1998	FY 1999
a. Hardware/Software Development	0	22,847	23,706
b. Contractor Engineering Support	0	1,542	4,542
c. Travel	0	55	55
d. Test and Evaluation	0	1,028	9,637
Total	0	25,472	37,940

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	TBD	11/97	114,775	114,775	0		22,847	23,706	68,222	114,775
Support and Management										
NAWCAD, PAX RV	WX/RX	10/97	20,030	20,030	0	0	1,597	4,597	13,836	20,030
Test and Evaluation										
NAWCAD, PAX RV	WX/RX	10/97	13,606	13,606	0	0	1,028	3,137	9,441	13,606
PMRF,Hawaii	TBD	10/97	6,500	6,500	0	0	0	6,500	0	6,500

DATE: September 1997

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

	Total FY 1996 & Prior	FY 1997 Actual	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Subtotal Production Development	0	0	22,847	23,706	68,222	114,775
Subtotal Support and Management	0	0	1,597	4,597	13,836	20,030
Subtotal Test and Evaluation	0	0	1,028	9,637	9,441	20,106
Total Project	0	0	25,472	37,940	91,499	154,911

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

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	1,719	1,650	1,828	1,867	1,907	1,949	1,995	CONT	CONT
X2074 Communications Support Systems	3,291	1,800	0	0	0	0	0	CONT	CONT
X1083 Shore to Ship Communications System	12,132	12,982	14,898	8,038	7,680	6,760	6,933	CONT	CONT
X0795 Support of MEECN	656	495	737	712	727	743	760	CONT	CONT
TOTAL	17,798	16,927	17,463	10,617	10,314	9,452	9,688	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.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: September 1997

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	1,719	1,650	1,828	1,867	1,907	1,949	1,995	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) ($864) 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) ($1,620) 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.

- (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) ($1,828) 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:

	FY 1997	FY 1998	FY 1999
(U) FY 1998 President's Budget	1,712	1,650	3,152
(U) Adjustments from FY 1998 PRESBUDG:	7	0	-1,324
(U) FY 1999 OSD Budget Submit:	1,719	1,650	1,828

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1997 adjustment is due to minor Navy adjustments +52K, Small Business Innovation Research (SBIR) transfer -$43K, and revised economic assumptions -$2K. FY 1999 adjustment due to -$50K redirected to develop and update overarching C4ISR requirements, adjustment for unjustified level of effort -$1,271K, and Navy Capital Working Fund adjustment -$16K, and DBOF Surcharge Correction +$13K.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: September 1997

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	6,767	22,850	22,020	23,306	32,678	35,688	CONT	CONT

(U) RELATED RDT&E: Not Applicable.

D. (U) SCHEDULE PROFILE: Not Applicable.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0204163N PROJECT NUMBER: X2074
PROGRAM ELEMENT TITLE: Fleet Communications 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	3,291	1,800	0	0	0	0	0	0	10,132

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) ($1,513) 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) ($765) Supported fielding of Joint Maritime Communications System (JMCOMS) Build 1.

- (U) ($1,013) Built, tested, and demonstrated JMCOMS Builds 2 and 3 including implementation and testing of IF RF network.

2. (U) FY 1998 PLAN:

- (U) ($718) Support field of JMCOMS Build 2.

- (U) ($1,082) Build, test, demonstrate and support fielding of JMCOMS Build 3.

3. (U) FY 1998 Plan: Not applicable.

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

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0204163N PROJECT NUMBER: X2074
PROGRAM ELEMENT TITLE: Fleet Communications PROJECT TITLE: Communications Support Systems (CSS)

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1997	FY 1998	FY 1999
(U) FY 1998 President's Budget:	3,418	4,209	6,596
(U) Appropriated Value:			
(U) Adjustments from FY 1998 PRESBUDG:	-127	-2,409	-6,596
(U) FY 1999 OSD/OMB Budget Submit:	3,291	1,800	0

(U) CHANGE SUMMARY EXPLANATION:

(U) FY 1997: -$79K minor Navy adjustment,-$44K for Small Business Innovation Research Program, and -$4K for Revised Economic Assumptions.

(U) FY 1998: -$2,409K for Truncated Program.

(U) FY 1999: -$6,596K PR adjustment to the CSS program line.

(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.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

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	12,132	12,982	14,898	8,038	7,680	6,760	6,933	CONT	CONT

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project develops communications systems elements which provide positive command and control of deployed of 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) ($6,694) 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.

2. (U) FY 1998 PLAN:

- (U) ($350) Continue high voltage and antenna component development and test.
- (U) ($7,309) Complete SLVR OPEVAL, 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) ($7,209) Continue SLVR P3I efforts; ELF upgrade completed.
- (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:

	FY 1997	FY 1998	FY 1999
(U) FY 1998 President's Budget:	13,334	12,982	12,767
(U) Appropriated Value:			
(U) Adjustments from FY 1998 PRESBUDG:	-1,202	0	+2,131
(U) FY 1999 OSD/OMB Budget Submit:	12,132	12,982	14,898

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

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

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1997 adjustment due to SBIR transfer -$204K, FFRDC reduction -$39K, minor Navy adjustments -$944K, and revised economic assumptions -$15K. FY 1999 adjustment due Navy Capital Working Fund adjustment -$67K, DBOF surcharge adjustment -$76K, programmatic adjustment of +2,800K for SSPAR install and test, adjustment of -$281K for SCAP/CEP efforts, and funds redirected to develop and update overarching C4ISR mission requirements -$245K.

(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	3,048	7,751	13,355	19,686	17,249	19,992	4,178	CONT	CONT
(U) OPN Line 3147 Advanced VLF Receiver	0	7,643	17,516	20,187	18,161	3,467	0	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

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

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:

	FY 1997	FY 1998	FY 1999
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			

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: September 1997

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

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

PROJECT COST CATEGORIES	FY 1997	FY 1998	FY 1999
a. Project Management	739	766	908
b. Systems Engineering	3,404	3,596	4,254
c. Software Development	2,328	2,441	2,874
d. Hardware Development	4,823	5,270	5,838
e. System Test & Evaluation	500	519	611
f. Integrated Logistic Spt	114	136	138
g. Site/Platform Integration	224	254	275
TOTAL	12,132	12,982	14,898

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: September 1997

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	2,928	7,479	9,371	CONT	CONT
ROCKWELL Richardson, TX	CPFF	12/93	11,287	11,287	10,113	1,711	0	0	0	11,824
TBD CONTRACTOR	FPIP					2,300				
Miscellaneous Labs	Various	10/95	N/A	N/A	896	113	576	935	CONT	CONT

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: September 1997

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

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 99 Budget	To Complete	Total Program
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.

	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Subtotal Product Development	10,920	12,659	14,711	CONT	CONT
Subtotal Support and Management	812	323	330	0	1,615
Subtotal Test and Evaluation	400	0	0	0	1,215
Total Project	12,132	12,982	15,041	CONT	CONT

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0204163N PROJECT NUMBER: X0795
PROGRAM ELEMENT TITLE: Fleet Communications 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	656	495	737	712	727	743	760	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) ($202) 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) ($187) 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).

. (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) ($255) 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 MMPM 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) ($306) 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.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0204163N PROJECT NUMBER: X0795
PROGRAM ELEMENT TITLE: Fleet Communications PROJECT TITLE: MEECN

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1997	FY 1998	FY 1999
(U) FY 1998 President's Budget:	674	495	774
(U) Appropriated Value:			
(U) Adjustments from FY 1998 PRESBUDG:	-18	0	-37
(U) FY 1999 FMB Budget Submit:	656	495	737

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1997 adjustment due to SBIR transfer -$12K, minor Navy adjustments -$5K, and Revised Economic Assumptions -$1K. FY 1999 adjustment due to redirection of funds to develop and update overarching C4ISR mission requirements -$12K, unjustified level of effort adjustment -$23K, and a Navy Capital Working Fund adjustment -$2K.

(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.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204227N
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	2,000	2,000	1,000	0	0	0	5,000
TOTAL	0	0	2,000	2,000	1,000	0	0	0	5,000

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

(U) W1843/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.

* Not previously identified as an R-1 line item.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204227N
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) ($0) Continue missile and launch control development and conduct Critical Design Review (funded by Boeing)
- (U) ($ 1,000) Start Test & Evaluation
- (U) ($ 1,000) Conduct CDR and Engineering IPT

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1997	FY 1998	FY 1999
(U) FY 1998/99 President's Budget:	0	0	0
(U) Appropriated Value	0		
(U) Adjustments from Pres. Budget:	0		2,000
(U) FY 1999 OSD/OMB Budget Submit:	0	0	2,000

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0204227N

PROGRAM ELEMENT TITLE: Harpoon Modifications

PROJECT NUMBER: W1843
PROJECT TITLE: Harpoon

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY99 net increase of $2 million is to conduct US Navy Team support and start 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)

	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
WPN Line 17									
Harp Bk II Qty	0	0	0	0	44	110	146	0	300
	0	0	0	0	2,800	5,700	6,500	0	15,000
OPN Line 136									
Quantity	0	0	0	50	50	0	0	0	100
Harp Bk II	0	0	0	500	500	0	0	0	1,000

(U) RELATED RDT&E: Not applicable.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

BUDGET ACTIVITY: 7
PROGRAM ELEMENT: 0204227N
PROGRAM ELEMENT TITLE: Harpoon Modifications
PROJECT NUMBER: W1843
PROJECT TITLE: Harpoon

D. (U) SCHEDULE PROFILE:

	FY 1997	FY 1998 *	FY 1999	TO COMPLETE
Program Milestones	N/A N/A	MSII 2Q	2Q CDR	1Q/01 MSII
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 845 agreement signed		3Q/01 FRP

* FY 1998 effort funded by Boeing

BUDGET ACTIVITY: 7 | PROGRAM ELEMENT: 0204227N | PROJECT NUMBER: W1843
PROGRAM ELEMENT TITLE: Harpoon Modifications | PROJECT TITLE: Harpoon

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

Project Cost Categories	FY 1997	FY 1998	FY 1999
a. Test & Evaluation	0	0	1,000
b. Government Field Support	0	0	950
c. Travel	0	0	50
Total	0	0	2,000

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 Comp	Total Program
Product Development:										
China Lake, CA	WX		1,100	1,100	0	0	0	500	600	1,100
Point Mugu, CA	WX		850	850	0	0	0	450	400	850
N/										
Support and Management:										
Miscellaneous			150	150	0	0	0	50	100	150
Test and Evaluation:										
Point Mugu, CA	WX	11/98	2,900	2,900	0	0	0	1,000	1,900	2,900

GOVERNMENT FURNISHED PROPERTY: Not applicable.

BUDGET ACTIVITY: 7
PROGRAM ELEMENT: 0204227N
PROGRAM ELEMENT TITLE: Harpoon Modifications
PROJECT NUMBER: W1843
PROJECT TITLE: Harpoon

	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
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	1,000	1,900	2,900
Total Project	0	0	0	2,000	3,000	5,000

FY 1999 RDT&E,N OSD/OMB BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

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	133,261	90,276	63,200	34,965	6,664	863	861	CONT.	CONT.
A1784 THEATER MISSION PLANNING CENTER	5,554	3,083	2,609	1,965	1,951	0	0	0	97,057
TOTAL	138,815	93,359	65,809	36,930	8,615	863	861	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 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.

FY 1999 RDT&E,N OSD/OMB BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

BUDGET ACTIVITY: 7
PROGRAM ELEMENT: 0204229N
PROGRAM ELEMENT TITLE: TOMAHAWK AND THEATER MISSION PLANNING CENTER
PROJECT NUMBER: A0545
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	133,261	90,276	63,200	34,965	6,664	863	861	CONT.	CONT.
CURRENT ACTUAL PROGRAM VALUE	133,266								
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.

FY 1999 RDT&E,N OSD/OMB BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

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) . Completed ATWCS LCG IOC software design/development and received ATWCS LCG IOC software delivery. 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 CCS MK2 Block 1C upgrade and New Attack Submarine (NSSN) Combat Control.

- (U) ($120,341) 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.

- (U) Not included in this submission is $5K reserved for cancelled accounts.

2. (U) FY 1998 PLAN:

- (U) ($311) Commence ATWCS LCG LRIP deliveries. Conduct ATWCS LCG DT assist/operational assessment (DA/OA), LBSIT and SBSIT. Achieve ATWCS TCG IOC and Milestone III. Conduct ATWCS LCG TECHEVAL and OPEVAL.

- (U) ($4,129) Continue development of Sub-ATWCS for CCS MK2 Program Block 1C and NSSN Combat Control. Deliver engagement planning Interface Definition Language (IDL) prototype and engineering build software of Sub ATWCS for Block 1C (software).

- (U) ($85,836) Conduct ATWCS for TBIP LBSIT. Continue ATWCS for TBIP Full Operational Capability (FOC) 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.

FY 1999 RDT&E,N OSD/OMB BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

BUDGET ACTIVITY: 7
PROGRAM ELEMENT: 0204229N
PROGRAM ELEMENT TITLE: TOMAHAWK AND THEATER MISSION PLANNING CENTER
PROJECT NUMBER: A0545
PROJECT TITLE: TOMAHAWK

3. (U) FY 1999 PLAN:

- (U) ($566) 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 and NSSN Combat Control. Deliver initial installation suites for SSN 688 CCS MK2 Program Block 1C Mod 0/1 and Mod 2.
- (U) ($58,100) Conduct DT/Operational Testing (OT) for ATWCS for TBIP. Achieve final ATWCS for TBIP Full Operational Capability (FOC) software delivery. Continue TBIP EMD, mission planning and weapons control systems upgrades. Continue demonstration test, operational test and OA.

FY 1999 RDT&E,N OSD/OMB BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

BUDGET ACTIVITY: 7
PROGRAM ELEMENT: 0204229N
PROGRAM ELEMENT TITLE: TOMAHAWK AND THEATER MISSION PLANNING CENTER
PROJECT NUMBER: A0545
PROJECT TITLE: TOMAHAWK

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1997	FY 1998	FY 1999
(U) FY 1998 President's Budget:	134,705	90,276	64,625
(U) Appropriated Value:	140,465		
(U) Adjustments from PRESBUDG:	-1,444	0	-1,425
(U) FY 1999 OSD/OMB Budget Submit:	133,261	90,276	63,200

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY97 decrease -$1,444 thousand consists of -$2,660 for SBIR reductions; -$4 thousand for FFRDC; -$171 thousand for revised economic reduction and +$1,391 thousand for a Resource Sponsor program adjustment. FY99 decrease consists of $+575 thousand for NWCF R&D and -$2,000 thousand for a program adjustment.

(U) Schedule: FY97 - ATWCS LCG LRIP moved from 2Q to 3Q due to delays in the competition and award process. MSIII ATWCS TCG IOC slipped from 2Q/97 to 1Q/98 and 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 1Q/98 due to shift in overall LCG schedule driven by TCG delays. 3Q/97 SBSIT ATWCS LCG moved to 2Q-3Q/98 due to LCG schedule adjustments from TCG delays. FY98 - ATWCS LCG 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 4Q/98 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.

FY 1999 RDT&E,N OSD/OMB BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

BUDGET ACTIVITY: 7
PROGRAM ELEMENT: 0204229N
PROGRAM ELEMENT TITLE: TOMAHAWK AND THEATER MISSION PLANNING CENTER
PROJECT NUMBER: A0545
PROJECT TITLE: TOMAHAWK

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) WPN	103,396	51,820	132,943	130,715	123,844	109,405	170,419	CONT.	CONT.
(U) OPN	83,687	65,502	98,001	87,414	74,847	55,236	56,405	CONT.	CONT.
(U) OPN	0	1,425	4,060	6,601	6,055	9,101	7,731	CONT.	CONT.

(U) RELATED RDT&E: Not applicable.

D. (U) SCHEDULE PROFILE:

	FY 1997	FY 1998	FY 1999	TO COMPLETE
Program Milestones	3Q ATWCS LCG LRIP	1Q MSIII ATWCS TCG IOC 4Q TBIP LRIP/ FRP DECISION	1Q ATWCS LCG IOC	4Q/00 IOC TBIP 4Q/01 SUB ATWCS IOC
Engineering Milestones	4Q TBIP CDR			
T&E 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 2-3Q SBSIT/TECH EVAL ATWCS LCG 1Q LBSIT ATWCS LCG 4Q OPEVAL ATWCS LCG	2-4Q/99 DT TBIP	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

FY 1999 RDT&E,N OSD/OMB PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: September 1997

BUDGET ACTIVITY: 7
PROGRAM ELEMENT: 0204229N
PROGRAM ELEMENT TITLE: TOMAHAWK AND THEATER MISSION PLANNING CENTER
PROJECT NUMBER: A0545
PROJECT TITLE: TOMAHAWK

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

Project Cost Categories	FY 1997	FY 1998	FY 1999
a. Software Development	58,020	31,642	22,196
b. Hardware/Software Development	72,841	50,634	28,004
c. Test & Evaluation	2,300	7,900	12,900
d. Travel	100	100	100
Total	133,261	90,276	63,200

FY 1999 RDT&E,N OSD/OMB PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: September 1997

BUDGET ACTIVITY: 7
PROGRAM ELEMENT: 0204229N
PROGRAM ELEMENT TITLE: TOMAHAWK AND THEATER MISSION PLANNING CENTER
PROJECT NUMBER: A0545
PROJECT TITLE: TOMAHAWK

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	48,139	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	5,675	237	975	CONT.	CONT.

FY 1999 RDT&E,N OSD/OMB PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: September 1997

BUDGET ACTIVITY: 7
PROGRAM ELEMENT: 0204229N
PROGRAM ELEMENT TITLE: TOMAHAWK AND THEATER MISSION PLANNING CENTER
PROJECT NUMBER: A0545
PROJECT TITLE: TOMAHAWK

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

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Support and 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

Item Description	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Delivery Date	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development									
Support and Management									
Test and Evaluation									

FY 1999 RDT&E,N OSD/OMB PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: September 1997

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204229N PROJECT NUMBER: A0545
PROGRAM ELEMENT TITLE: TOMAHAWK AND THEATER MISSION PLANNING CENTER PROJECT TITLE: TOMAHAWK

	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Subtotal Production Development	1,942,829	130,961	82,376	50,300	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	133,261	90,276	63,200	CONT.	CONT.

FY 1999 RDT&E,N OSD/OMB BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

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	5,554	3,083	2,609	1,965	1,951	0	0	0	97,057

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.

FY 1999 RDT&E,N OSD/OMB BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

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) Commenced APS Strike Module Development/Operational Employment.
- (U) ($1,955) Continued TMPC integration of New National Sensors and Software Architectural Enhancements.
- (U) ($1,720) Supported development of enhancements to the MDS and ETEPP portion of the TOMAHAWK Strike Planning Tools.

2. (U) FY 1998 PLAN:

- (U) ($1,860) 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) ($1,569) 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.

FY 1999 RDT&E,N OSD/OMB BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0204229N PROJECT NUMBER: A1784
PROGRAM ELEMENT: TITLE: THEATER MISSION PLANNING CENTER PROJECT TITLE: TMPC

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1997	FY 1998	FY 1999
(U) FY 1998 President's Budget:	5,660	3,083	2,628
(U) Appropriated Value	5,899		
(U) Adjustments from PRESBUDG:	-106	0	-19
(U) FY 1999 OSD/OMB Budget Submit:	5,554	3,083	2,609

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY97 decrease of -$106 thousand consists of -$99 thousand for SBIR and -$7 thousand for revised economic adjustments. The FY99 net decrease of -$19 thousand is for National Working Capital Fund surcharge.

(U) Schedule: Not applicable

(U) Technical: Not applicable

FY 1999 RDT&E,N OSD/OMB BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

BUDGET ACTIVITY: 7
PROGRAM ELEMENT: 0204229N
PROGRAM ELEMENT TITLE: THEATER MISSION PLANNING CENTER
PROJECT NUMBER: A1784
PROJECT TITLE: TMPC

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

Appropriation/Line Number	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
WPN	2,830	2,867	3,787	3,762	6,636	6,939	9,073	CONT.	CONT.
OPN	16,187	28,343	48,665	37,514	27,935	28,995	29,765	CONT.	CONT.

D. (U) SCHEDULE PROFILE:

	FY 1997	FY 1998	FY 1999	TO COMPLETE
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	

FY 1999 RDT&E,N OSD/OMB PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: September 1997

BUDGET ACTIVITY: 7

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

PROJECT NUMBER: A1784
PROJECT TITLE: TMPC

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

Project Cost Categories	FY 1997	FY 1998	FY 1999
a. Software Development	5,554	3,083	2,609
Total	5,554	3,083	2,609

FY 1999 RDT&E,N OSD/OMB PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: September 1997

BUDGET ACTIVITY: 7
PROGRAM ELEMENT: 0204229N
PROGRAM ELEMENT TITLE: THEATER MISSION PLANNING CENTER
PROJECT NUMBER: A1784
PROJECT TITLE: TMPC

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										
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	1,884	905	731	2,241	38,818

Support and Management Not Applicable

Test and Evaluation Not Applicable

GOVERNMENT FURNISHED PROPERTY Not Applicable

Item Description	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Delivery Date	FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development									
Support and Management									
Test and Evaluation									

FY 1999 RDT&E,N OSD/OMB PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: September 1997

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	5,554	3,083	2,609	3,916	97,057
Subtotal Support and Management						
Subtotal Test and Evaluation						
Total Project	81,895	5,554	3,083	2,609	3,916	97,057

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: Sep 1997

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	16,858	8,564	17,108	17,816	17,671	16,422	17,562	CONT.	CONT.
X0758 SURTASS	16,278	1,318	4,008	5,021	6,658	6,822	8,001	CONT.	CONT.
TOTAL	33,136	9,882	21,116	22,837	24,329	23,244	25,563	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 because it encompasses engineering and manufacturing development for upgrade of existing operational systems.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: Sep 1997

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	16,858	8,564	17,108	17,816	17,671	16,422	17,562	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.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) ($ 2,000) Conducted analysis, trade-off studies and prototyping for Compact LFA.
- (U) ($ 1,416) Continued LFA development of data fusion algorithms and C4I interfaces for tactical reporting.
- (U) ($ 1,569) 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) ($ 3,465) Completed and installed SDS Build 5 at 4400. Completed SDS TECHEVAL and OPEVAL. Assessed FDS SSIPS real world performance and corrected software to optimize processing.
- (U) ($ 2,051) 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) ($ 1,500) Conducted investigations and analysis to support preparation of Environmental Impact Statement (EIS) for LFA.
- (U) ($ 1,851) Continued sea testing and tested data analysis.

2. (U) FY 1998 PLAN:

- (U) ($ 1,049) SDS design development; complete coding, integrating and test of baseline system. Conduct

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) ($ 4,971) 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) ($ 1,159) 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) ($740) 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) ($7,676) Continue development of CLFA EDM transmit source array.

- (U) ($5,458) 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) ($1,775) 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:	-945		-1,219
(U) FY 1999 OSD Budget Submit:	16,858	8,564	17,108

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY97 was decreased by $945K; -$449K for Small Business Innovative Research assessment; -$496K Navy minor program adjustments. FY99 was reduced by $1,219K; -$1M and -$277K to reflect redirection to develop and update C4ISR mission requirements; +$58K for NWCF rate adjustments.

(U) Schedule/Technical: FY99: Delays SDS/SSIPS system integration of JMCIS, C4ISR and threat orientated processing enhancements, reducing ability to meet mission needs.

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# 2225	31,649	15,175	8,543	20,405	40,105	38,052	7,906	CONT.	CONT.
OMN 1C3C	66,718	68,352	73,495	73,801	74,684	76,128	90,684	CONT.	CONT.
OPN# 2237	10,215	7,108	13,031	14,145	5,475	23,835	26,738	CONT.	CONT.

(U) RELATED RDT&E:
(U) PE 0204311N(Integrated Surveillance System)
(U) PE 0603785N(Combat Systems Oceanographic Performance Assessment)

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: Sep 1997

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

(U) PE 0604507N(Enhanced Modular Signal Processor)
(U) PE 0603747N(Undersea Warfare Advanced Technology)

D. (U) SCHEDULE PROFILE:

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

Contract
Milestones

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

Project Cost Categories	FY 1997	FY 1998	FY 1999
a. Software Development/Testing	2,602	1,609	1,656
b. Program Management	828	257	433
c. Special Projects	95	107	110
d. System Integration/ Receive Subsystem	6,095	0	3,522
e. Sea Tests/Data Analysis	2,362	0	1,775
f. LFA Littoral Improvements	4,876	6,591	9,612
Current Controls	16,858	8,564	17,108

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: Sep 1997

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

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle Program	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
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.
HAC Fullerton, CA	SS/CPFF	8/90 option	63,228	63,228	43,974	11,429	9,135	2,192	2,951	CONT.	CONT.
LOCKHEED MARTIN Nashau, NH	SS/CPFF	10/97 option						1,505	7,009	CONT.	CONT.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: Sep 1997

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	330	200	425	CONT.	CONT.
Various	WX					389	400	314	500	CONT.	CONT.
Test and Evaluation											
Various	WX					880	991	400	575	CONT.	CONT.
GOVERNMENT FURNISHED PROPERTY	Not applicable.										
Subtotal Product Development						18,000	15,137	7,650	15,608	CONT.	CONT.
Subtotal Support and Management						639	730	514	925	CONT.	CONT.
Subtotal Test and Evaluation						880	991	400	575	CONT.	CONT.
Total Project						19,519	16,858	8,564	17,108	CONT.	CONT.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: Sep 1997

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	16,278	1,318	4,008	5,021	6,658	6,822	8,001	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) ($12,694) 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.

- (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) ($ 1,294) 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) ($2,448) 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) ($1,560) Continue array improvements and integration and expanded array interoperability.

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1997	FY 1998	FY 1999
(U) FY 1998 President’s Budget:	16,805	1,318	6,050
Adjustments from FY98 PRESBUDG:	-527	0	-2,042
(U) FY 1999 OSD Budget Submit:	16,278	1,318	4,008

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY97 was decreased by $527K; -$438K for Small Business Innovative Research assessment and -$89K for Navy minor program adjustments.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: Sep 1997

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

FY99 was decreased by $2,042K; -$2,000K to reduce SURTASS array improvements, -$65K Navy minor program adjustments, and +$23K 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 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
SCN	0	0	84,086	0	0	0	0	CONT.	CONT.
OPN #2237	10,215	7,108	13,031	14,145	5,475	23,835	26,738	CONT.	CONT.

(U) RELATED RDT&E:

(U) PE 0204311N(Integrated Surveillance System)
(U) PE 0603785N(Combat Systems Oceanographic Performance Assessment)
(U) PE 0604507N(Enhanced Modular Signal Processor)
(U) PE 0603747N(Undersea Warfare Advanced Technology)

D. (U) SCHEDULE PROFILE:

	FY 1997	FY 1998	FY 1999
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			

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: Sep 1997

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	FY 1997	FY 1998	FY 1999
a. Passive Processing/Automation	2,492	0	2,448
b. Array Improvements	12,694	0	1,560
c. Signal Processing Improvements	1,092	1,318	0
Current Allocation	16,278	1,318	4,008

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: Sep 1997

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											
HAC Fullerton, CA	SS/CPFF	5/89 option	32,500	32,500	25,407	4,440	0	0	0	CONT.	CONT.
HAC 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	800	CONT.	CONT.
Support and Management											
VARIOUS	WR					900	1,100	218	200	CONT.	CONT.
Test and Evaluation											
VARIOUS	WR					1,226	900	0	800	CONT.	CONT.

GOVERNMENT FURNISHED PROPERTY Not applicable.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: Sep 1997

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

	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Subtotal Product Development	14,278	1,100	3,008	CONT.	CONT.
Subtotal Support and Management	1,100	218	200	CONT.	CONT.
Subtotal Test and Evaluation	900		800	CONT.	CONT.
Total Project	16,278	1,318	4,008	CONT.	CONT.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

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
S2231	MCAC Weapons Development								
	896	672	1,981	3,523	2,023	2,023	2,023	CONT.	CONT.
TOTAL	1,442	672	1,981	3,523	2,023	2,023	2,023	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 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 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.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

BUDGET ACTIVITY: 7
PROGRAM ELEMENT: 0204413N
PROGRAM ELEMENT TITLE: Amphibious Tactical Support Units
PROJECT NUMBER: S2231
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
S2231	MCAC Weapons Development								
	896	672	1,981	3,523	2,023	2,023	2,023	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.
   - (U) ($211) Unexecuted funding dollars have been reprogrammed by N85 and N86.
2. (U) FY 1998 PLAN:
   - (U) ($672) Full scale testing of Deep Skirt.

3. (U) FY 1999 PLAN:

- (U) ($1,981) Develop and approve operational concept for remote control

B. (U) PROGRAM CHANGE SUMMARY:

	FY1997	FY1998	FY1999
(U) FY 1998 President's Budget	897	672	3,210
(U) Appropriated Value:	946		
(U) Adjustments to FY 1997Appropriated Value/ FY 1998 President’s Budget:			
(a) Undistributed Reductions	-50		-19
(b) PR99 Adjustments			-1,210
(U) FY 1999 OSD/OMB Budget Submit:	896	672	1,981

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: The decrease in FY 1997 totaling (-$50K) results from undistributed reductions. The decrease in FY99 totaling is a combination of undistributed reductions and pricing adjustments.

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

BUDGET ACTIVITY: 7
PROGRAM ELEMENT: 0204413N
PROGRAM ELEMENT TITLE: Amphibious Tactical Support Units
PROJECT NUMBER: S2231
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	4,400	4,400	CONT.	CONT.

(U) RELATED RDT&E - Not applicable.

D. (U) SCHEDULE PROFILE:

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

DATE: September 1997

BUDGET ACTIVITY: 7

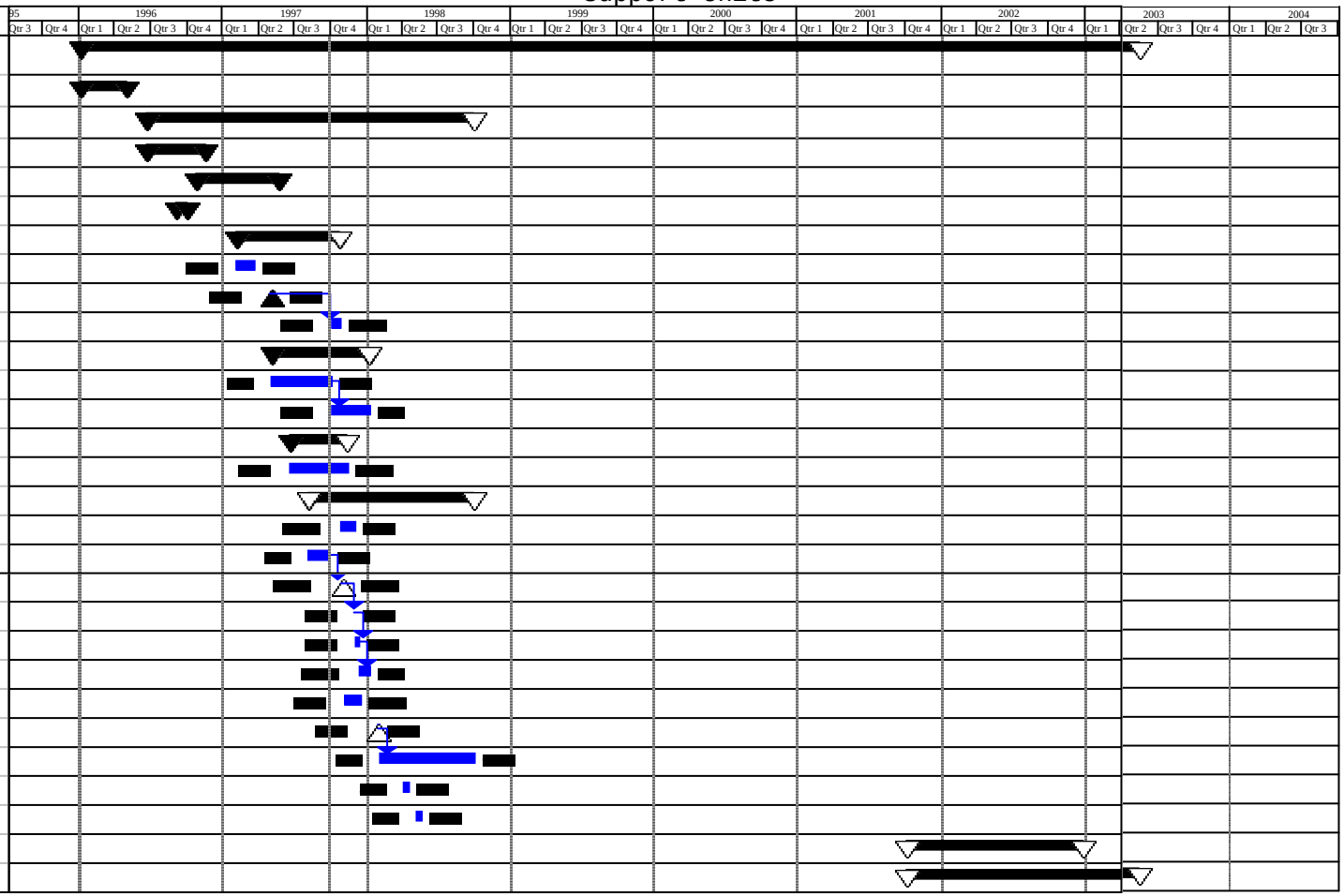
PROGRAM ELEMENT: 0204413N

PROGRAM ELEMENT TITLE: Amphibious Tactical Support Units

PROJECT NUMBER: S2231

PROJECT TITLE: MCAC Weapons Development

ID	Task Name
1	***DEEP SKIRT R&D PROJECT***
2	***CONCEPT TRADEOFF STUDIES***
9	***DEEP SKIRT DESIGN DEVELOPMENT***
10	DEVELOP BASIC GEOMETRY
12	DEEP SKIRT TOW TANK TESTS
33	CONTRACT PROTOTYPE PROCUREMENT
34	DEEP SKIRT MECH. MODIFICATIONS
35	DESIGN OF MODS
36	FINAL DESIGN REV, FAB GO AHAED
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 PROTOTYPE SKIRT
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



FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: September 1997

BUDGET ACTIVITY: 7

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

PROJECT NUMBER: S2231
PROJECT TITLE: MCAC Weapons Development

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

Project Cost Categories	FY 1997	FY 1998	FY 1999
a. Primary Hardware Development	131	0	1,901
b. Integrated Logistics Support	50	0	0
c. Program Management Support	180	60	60
d. Test and Evaluation	515	597	0
e. Travel	20	15	20
Total	896	672	1,981

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

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: September 1997

BUDGET ACTIVITY: 7

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

PROJECT NUMBER: S2231
PROJECT TITLE: MCAC Weapons Development

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										
VARIOUS	WR	12/97	CONT.	CONT.	3,319	181	0	1,901	CONT.	CONT.
Support and Management										
VARIOUS	CPAF	01/98	CONT.	CONT.	650	200	75	80	CONT.	CONT.
Test and Evaluation										
VARIOUS	WR	12/97	CONT.	CONT	3,549	515	597	0	CONT.	CONT.

GOVERNMENT FURNISHED PROPERTY

Item Description	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Delivery Date	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program

Product Development Not applicable.

Support and Management Not applicable.

Test and Evaluation Not applicable.

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: September 1997

BUDGET ACTIVITY: 7

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

PROJECT NUMBER: S2231
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	181	0	1,901	CONT.	CONT.
Subtotal Support and Management	650	200	75	80	CONT.	CONT.
Subtotal Test and Evaluation	3,549	515	597	0	CONT.	CONT.
Total Project	7,518	896	672	1,981	CONT.	CONT.

DATE: September 1997

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

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
S1427/21427 Surface Tactical Team Trainer (STTT)	5,090	5,948	6,252	327	325	574	1,078	CONT.	CONT.
S1823/21823 Training and Modeling Systems (TMS)	3,658	8,785	8,266	8,369	10,590	8,794	8,971	CONT.	CONT.
W0431 Tactical Aircrew Combat Training System (TACTS)	3,263	3,512	3,114	5,030	4,998	6,330	6,430	CONT.	CONT.
W0604 Training Range and Instrumentation Development (TRID)	8,554	4,315	2,220	1,754	1,057	2,087	1,685	CONT.	CONT.
W1998 Joint Tactical Combat Training System (JTCTS)	19,528	33,623	0	0	0	0	0	0	111,718
W2124 Air Warfare Training Development (AWTD)	1,716	2,106	2,087	2,214	2,272	2,036	2,288	CONT.	CONT.
X1823 Training and Training Devices Systems (TTDS)	1,425	900	0	0	0	0	0	0	13,711*
TOTAL	48,073	58,612	47,343	24,243	23,887	24,426	23,707	CONT.	CONT.

* This amount includes FY92-FY98.

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The STTT will develop the Battle Force Tactical Training 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). 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 training systems, and shallow water range technology. JTCTS (formerly TCTS) became a joint USN/USAF program in March, 1994. JTCTS was initially planned to provide U.S. Navy fleet deployable instrumentation for at sea surface, subsurface, and air training and tactics development

DATE: September 1997

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N
PROGRAM ELEMENT TITLE: Consolidated Training Systems Development

(U) COST: (Dollars in Thousands)

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 Group 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) which was a former Advanced Research Projects Agency project known as What-If Simulation System for Advanced Research & Development (WISSARD). 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.

DATE: SEPTEMBER 1997

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

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
S1427/21427 Surface Tactical Team Trainer (STTT)	5,090	5,948	6,252	327	325	574	1,078	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.

DATE: SEPTEMBER 1997

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

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

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1.(U) FY 1997 ACCOMPLISHMENTS:

- ($1,455) 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). (12/96)

- (U) ($155) Mine Warfare - Continued development of the software modifications required to integrate the Mine Warfare capability with BFTT. (04/97)

- (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. (01/97)

- (U) ($2,000) CST/EW - Resumed development of the Cryptologic Systems Trainer (CST)/Electronic Warfare (EW). ($500K - 06/97, $1,500K 08/97)

2. (U) FY 1998 PLAN:

- (U) ($2,859) BFTT B/L 1 - Develop software required as a result of lessons learned/additional Fleet requirements since BFTT IOC to include an automated interface to the Naval Warfare Tactical Data Base (NWTDB) and complete software development of the modifications required to incorporate amphibious/littoral functionality into BFTT software. (12/97)

- (U) ($500) Mine Warfare - Complete development of the software modifications required to integrate the Mine Warfare capability. (12/97)

- (U) ($1,589) STIM/SIM - Continue development of the MK 91 NATO Sea Sparrow Missile System RF Stimulator. (04/98)

DATE: SEPTEMBER 1997

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

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

- (U) ($1,000) CST/BEWT - Continue development of the BFTT Electronic Warfare Trainer (BEWT) and its integration with BFTT. (01/98)

3. (U) FY 1999 PLAN:

- (U) ($2,045) 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. (12/98)

- (U) ($1,707) STIM/SIM - Complete development of the MK 91 NATO Sea Sparrow Missile System RF Stimulator. (04/99)

- (U) ($2,500) CST/BEWT - Integrate the BEWT into BFTT. (04/99)

DATE: SEPTEMBER 1997

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

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

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1997	FY 1998	FY 1999
(U) FY 1998/1999 President's Budget:	5,178	4,948	3,761
(U) Appropriated Value:	5,414	0	0
(U) Adjustments from PRESBUDG:	- 88	+1,000	+ 2,491
(U) FY 1999 OSD/OMB Budget Submit:	5,090	5,948	6,252

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY 97 net adjustment of -$82 thousand reflects a Small Business Innovative Research (SBIR) reduction, and -6 thousand reflects FY 97 Revised Economic Assumptions. The FY 98 adjustment is to provide funds for the continuation of the CST/BEWT program. The FY 99 net adjustment of +2,491 thousand reflects a +2,500 thousand plus up for BFTT CST/BEWT Integration and a -9 thousand NWCF Surcharge Correction.

(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.

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 #2762	25,921	20,739	27,072	39,126	15,534	38,122	26,220	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

DATE: SEPTEMBER 1997

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

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

D. (U) SCHEDULE PROFILE:

	FY 1997	FY 1998	FY 1999
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		1Q Stim/Sim Contract Award	

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

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

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

Project Cost Categories	FY 1997	FY 1998	FY 1999
a. Systems Engineering			
o BFTT B/L 1	102	300	109
o CST/BEWT	500	200	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	200	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	2,238	1,736
o CST/BEWT	1,000	600	500
o Mine Warfare	100	400	0
d. Dev. Spt. Eqpt. Acquisition			
o CST	0	0	250
Total	5,090	5,948	6,252

DATE: SEPTEMBER 1997

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 7
PROGRAM ELEMENT: 0204571N
PROGRAM ELEMENT TITLE: Consolidated Training Systems Development
PROJECT NUMBER: 21427
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 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.	17,882	1,660	2,987	2,706	CONT.	CONT.
NSWC/DD	WR/RC	3/95	6,378	6,378	6,378	0	200	0	6,378	6,378
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	1,738	1,700	2,771	CONT.	CONT.
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 FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development			60 DAYS ARO						
MISC	RCP	10/97		1,500	500	500	250	CONT.	CONT.
Support and Management									
Test and Evaluation									

DATE: SEPTEMBER 1997

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 7
PROGRAM ELEMENT: 0204571N
PROGRAM ELEMENT TITLE: Consolidated Training Systems Development
PROJECT NUMBER: 21427
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	5,548	5,898	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	5,948	6,252	CONT.	CONT.

DATE: SEPTEMBER 1997

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

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
S1823/21823 Training and Modeling Systems (TMS)	3,658	8,785	8,266	8,369	10,590	8,794	8,971	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^4I) 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.

DATE: SEPTEMBER 1997

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 7
PROGRAM ELEMENT: 0204571N
PROGRAM ELEMENT TITLE: Consolidated Training Systems Development
PROJECT NUMBER: 21823
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. ($1,208K - 12/96, $1,504K - 01/97, $770K - 02/97, $176K - 04/97)

2. (U) FY 1998 PLAN:

- (U)($8,785) 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. ($3,746K - 12/97, $2,710K - 01/98, $2,329K - 03/98)

3. (U) FY 1999 PLAN:

- (U)($8,266) 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. ($2,118K) -12/98 ($4,148K) - 01/99 ($2,000K) - 3/99.

DATE: SEPTEMBER 1997

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 7
PROGRAM ELEMENT: 0204571N
PROGRAM ELEMENT TITLE: Consolidated Training Systems Development
PROJECT NUMBER: 21823
PROJECT TITLE: Training and Modeling Systems (TMS)

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1997	FY 1998	FY 1999
(U) FY 1998/1999 President's Budget:	4,230	8,785	8,304
(U) Appropriated Value	0	0	0
(U) Adjustments from PRESBUDG:	-572	0	-38
(U) FY 1999 OSD/OMB Budget Submit:	3,658	8,785	8,266

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY 97 net adjustment of -$67 thousand reflects a Small Business Innovative Research (SBIR) reduction, and -$502 thousand reflects a Below Threshold Reprogramming (BTR). The FY 99 net adjustment of -$38 thousand reflects a NWCF reduction..

(U) Schedule: Not Applicable

(U) Technical: Not Applicable.

DATE: SEPTEMBER 1997

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 7
PROGRAM ELEMENT: 0204571N
PROGRAM ELEMENT TITLE: Consolidated Training Systems Development
PROJECT NUMBER: 21823
PROJECT TITLE: Training and Modeling Systems (TMS)

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

(U)	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
JSIMS - M:									
(U) OPN LI #2760	0	23	2,232	3,556	3,341	3,367	3,400	CONT.	CONT.
(U) OMN AG/SAG 1C4C	0	1,286	892	899	907	916	926	CONT.	CONT.
(U) MPN AG 1C	0	390	401	410	420	432	444	CONT.	CONT.

(U) RELATED RDT&E: NOT APPLICABLE

DATE: SEPTEMBER 1997

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 7
PROGRAM ELEMENT: 0204571N
PROGRAM ELEMENT TITLE: Consolidated Training Systems Development
PROJECT NUMBER: 21823
PROJECT TITLE: Training and Modeling Systems (TMS)

D.(U) SCHEDULE PROFILE:

	FY 1997	FY 1998	FY 1999
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			

DATE: SEPTEMBER 1997

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 7
PROGRAM ELEMENT: 0204571N
PROGRAM ELEMENT TITLE: Consolidated Training Systems Development
PROJECT NUMBER: 21823
PROJECT TITLE: Training and Modeling Systems (TMS)

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

Project Cost Categories	FY 1997	FY 1998	FY 1999
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	2,400	200
o Build N2	0	1,529	1,500
o Build N3	0	500	1,896
o Build N4			1,500
o Build N5			250
o Build N6			
Total	3,658	8,785	8,266

DATE: SEPTEMBER 1997

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 7
PROGRAM ELEMENT: 0204571N
PROGRAM ELEMENT TITLE: Consolidated Training Systems Development
PROJECT NUMBER: 21823
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	5,770	5,291	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										

DATE: SEPTEMBER 1997

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 7
PROGRAM ELEMENT: 0204571N
PROGRAM ELEMENT TITLE: Consolidated Training Systems Development
PROJECT NUMBER: 21823
PROJECT TITLE: Training and Modeling Systems (TMS)

	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Subtotal Product Development	0	3,395	8,385	7,816	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	8,785	8,266	CONT.	CONT.

DATE: September 1997

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

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)	3,263	3,512	3,114	5,030	4,998	6,330	6,430	CONT.	CONT.
Current Program Value 3,509									

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) ($208) Aircraft Integration - Completed the development of training capabilities for the F/A-18E/F.
- (U) ($1,502) 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) ($1,453) 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) ($100) Studies/Analysis/T&E - Conducted development testing of the AMODSM.
- (U) This submission does not reflect an increase of $254 thousand in support of weapons integration and systems upgrades and a reprogramming of $8 thousand to the Joint Tactical Combat Training System Program.

DATE: September 1997

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

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

2. (U) FY 1998 PLAN:

- (U)($1,635) 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) ($1,560) System Upgrades - Continue development of block 6.0 and A10 software. Complete development of the AM0DSM.
- (U) ($317) 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) ($1,534) System Upgrades - Complete development of block 6.0 and A10 software.
- (U) ($415) Studies/Analysis/T&E - Test block 6.0 and A10 software and simulation capability for JSOW.

DATE: September 1997

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

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

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1997	FY 1998	FY 1999
(U) FY 1998 President's Budget:	3,346	3,512	3,112
(U) Appropriated Value:	3,538		
(U) Adjustments from PRESBUDG:	-83	0	+2
(U) FY 1999 OSD/OMB Budget Submit:	3,263	3,512	3,114

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY97 decrease of -$83 thousand reflects a $79 thousand Small Business Innovation Research Assessment and $4 thousand for an Economic Assumption Adjustment. The FY99 increase of +$2 thousand reflects minor pricing 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-2Q/99

(U) Technical: Not Applicable.

DATE: September 1997

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 7
PROGRAM ELEMENT: 0204571N
PROGRAM ELEMENT TITLE: Consolidated Training Systems Development
PROJECT NUMBER: WO431
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 #130	2,906	150	0	1,000	1,000	0	0	0	0
(U) APN/P-1 #52	1,028	0	229	4,307	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:

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

DATE: September 1997

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

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

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

Project Cost Categories	FY 1997	FY 1998	FY 1999
a. Systems/Software Development	2,422	3,035	2,549
b. T&E	100	55	100
c. Systems Engineering	711	382	425
d. Travel	30	40	40
Total	3,263	3,512	3,114

DATE: September 1997

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

BUDGET ACTIVITY: 7
PROGRAM ELEMENT: 0204571N
PROGRAM ELEMENT TITLE: Consolidated Training Systems Development
PROJECT NUMBER: W0431
PROJECT TITLE: Tactical Aircrew Combat Training System (TACTS)

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										
Miscellaneous	Various	1Q/99	CONT.	CONT.	25,466	2,452	3,075	2,589	CONT.	CONT.
Support and Management										
Miscellaneous	Various	1Q/99	CONT.	CONT.	14,130	711	382	425	CONT.	CONT.
Test and Evaluation										
Miscellaneous	Various	1Q/99	CONT.	CONT.	3,490	100	55	100	CONT.	CONT.

GOVERNMENT FURNISHED PROPERTY: Not Applicable

*This amount includes FY90-FY96

DATE: September 1997

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

BUDGET ACTIVITY: 7
PROGRAM ELEMENT: 0204571N
PROGRAM ELEMENT TITLE: Consolidated Training Systems Development
PROJECT NUMBER: WO431
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	2,452	3,075	2,589	CONT.	CONT.
Subtotal Systems Engr/Management	14,130	711	382	425	CONT.	CONT.
Subtotal Test and Evaluation	3,490	100	55	100	CONT.	CONT.
Total Project	43,086	3,263	3,512	3,114	CONT.	CONT.

DATE: September 1997

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

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)	8,554	4,315	2,220	1,754	1,057	2,087	1,685	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 the following systems: Range Electronic Warfare Simulators (REWS) and associated subsystems, Target Control System, Large Area Tracking Range (LATR), Underwater Training System-Mobile (UTS-M), Shallow Water Undersea Warfare Training Range (SWUWTR) technology and assorted Advanced Weapons Training Systems (AWTS), such as Imaging Weapons Training Systems (IWTS), Weapons Impact Scoring Set (WISS), Hawaii Island Shallow Water Training Range (HI SWTR) and range requirements, and Naval Gunfire Scoring Simulation (NGSS).

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) ($1,000) Initiated development of IWTS Pre-Planned Product Improvement (P3I). Continued development of Remote Strafe Scoring System (RSSS) Product Improvement Program (PIP).

DATE: September 1997

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 7
PROGRAM ELEMENT: 0204571N
PROGRAM ELEMENT TITLE: Consolidated Training Systems Development
PROJECT NUMBER: W0604
PROJECT TITLE: Training Range and Instrumentation Development

- (U) ($129) Continued to support development of Next Generation Target Control System (NGTCS).
- (U) ($2,138) Completed technology development for CONUS Shallow Water Range (SWR) to meet FY 97 MS III. Continued technology development for UTS(M) to reflect identified requirements. Continued development for phase II of HI Shallow Water Training Range (SWTR). Conducted technology development to incorporate NGSS capability into (SWTR).
- (U) ($348) Continued systems definitions, development of specifications, analysis of concepts, and systems engineering for various projects. Continued systems engineering efforts for range integration and initiated development of a common range architecture that meets High Level Architecture (HLA) standards.
- (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) ($4,839) 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.
- (U) This submission does not reflect reprogrammings of $160 thousand in support of Joint Tactical Combat Training System program, $254 thousand to the Tactical Aircrew Combat Training System, $18 thousand for M Account, $11 thousand for lapsed liability, and $1 thousand reserved for economic recission.

2. (U) FY 1998 PLAN:

- (U) ($1,000) Complete development and testing of RSSS PIP. Continue development of IWTS P3I. Initiate investigation of Advanced Weapons Training Systems (AWTS) requirements.
- (U) ($260) Complete support development and testing of NGTCS.

DATE: September 1997

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 7
PROGRAM ELEMENT: 0204571N
PROGRAM ELEMENT TITLE: Consolidated Training Systems Development
PROJECT NUMBER: W0604
PROJECT TITLE: Training Range and Instrumentation Development

- (U) ($2,246) Continue technology development for shallow water ranges. Complete phase II of HI SWTR. Continue technology development to incorporate NGSS capability into SWTR.

- (U) ($809) Continue systems definitions, development of specifications, analysis of concepts, and systems engineering for 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.

3. (U) FY 1999 PLAN:

- (U) ($800) Continue development of IWTS P3I. Conduct testing and obtain MS III of RSSS PIP. Continue investigation of AWTS requirements.

- (U) ($500) Continue technology development to incorporate NGSS capability into SWTR.

- (U) ($420) 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) ($500) 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.

DATE: September 1997

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 7
PROGRAM ELEMENT: 0204571N
PROGRAM ELEMENT TITLE: Consolidated Training Systems Development
PROJECT NUMBER: W0604
PROJECT TITLE: Training Range and Instrumentation Development

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1997	FY 1998	FY 1999
(U) FY 1998 President's Budget:	12,993	4,315	4,500
(U) Appropriated Value:	13,615		
(U) Adjustments from PRESBUDG:	-4,439	0	-2,280
(U) FY 1999 OSD/OMB Budget Submit:	8,554	4,315	2,220

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY 97 decrease of -$4,439 thousand reflects -$197 thousand Small Business Innovation Research Assessment and -$4,242 transfer of funds to the Other Procurement Navy appropriation based on a reclassification action for the congressionally directed Large Area Tracking Range Air Combat Maneuvering Instrumentation at the Pacific Missile Range Facility. The FY 99 decrease of -$2,280 thousand reflects a resource sponsor reduction, which resulted in the rescope of the IWTS, UTS(M) and NGTCS programs. A minor portion of the decrease is associated with Navy Working Capital Fund and Resource Sponsor balancing adjustments.

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

The following milestones have been changed:

From	To
IWTS P3I DT-II 1Q/96-1Q/99	IWTS P3I DT-II 1Q/97-4Q/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

DATE: September 1997

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 7
PROGRAM ELEMENT: 0204571N
PROGRAM ELEMENT TITLE: Consolidated Training Systems Development
PROJECT NUMBER: W0604
PROJECT TITLE: Training Range and Instrumentation Development

(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/P-1 #130	19,966	3,777	4,922	10,797	21,379	14,628	15,799	CONT.	CONT.

(U) RELATED RDT&E: Not Applicable.

D. (U) SCHEDULE PROFILE:

	FY 1997	FY 1998	FY 1999	TO COMPLETE
Program Milestones	3Q Phase II SWTR MS-III 3Q SWR MS-III		1Q RSSS PIP MS III	
Engineering Milestones				
T&E Milestones	1Q/97-4Q/00 IWTS P3I DT-II	1Q/98-4Q/98 RSSS PIP DT-II		
Contract Milestones	4Q Phase II SWTR Contract Award			

DATE: September 1997

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

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N
PROGRAM ELEMENT TITLE: Consolidated Training Systems Development

PROJECT NUMBER: W0604
PROJECT TITLE: Training Range and Instrumentation Development

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

Project Cost Categories	FY 1997	FY 1998	FY 1999
a. Systems Engineering and Software Development			
· AWTS	871	858	670
· UTS, SWR and NGSS	2,285	2,146	500
· Target Control System Integration	129	260	0
· Range Integration Requirements	209	638	234
. LATR	0	0	500
b. Range Requirements & Engineering Technical Services and Support	304	347	247
d. Travel	64	66	69
e. Funding for PMRF Optical Sensors	4,692	0	0
f. Reprogrammings	434		
Total	8,554	4,315	2,220

DATE: September 1997

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

BUDGET ACTIVITY: 7
PROGRAM ELEMENT: 0204571N
PROGRAM ELEMENT TITLE: Consolidated Training Systems Development
PROJECT NUMBER: W0604
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	3,124	3,968	1,973	CONT.	CONT.
BMDO	MIPR	4Q/97	4,692	4,692	0	4,692	0	0	0	4,692
Support and Management										
Miscellaneous	RC/WX	1Q/99	CONT.	CONT.	9,570	304	347	247	CONT.	CONT.

Test and Evaluation: None

GOVERNMENT FURNISHED PROPERTY: Not Applicable.

*This includes FY90-FY96.

DATE: September 1997

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

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N
PROGRAM ELEMENT TITLE: Consolidated Training Systems Development

PROJECT NUMBER: W0604
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	3,558	3,968	1,973	CONT.	CONT.
Subtotal Support and Management	9,570	304	347	247	CONT.	CONT.
Funding for PMRF Optical Sensors		4,692			0	4,692
Reprogrammings		434				
Total Project	81,394	8,554	4,315	2,220	CONT.	CONT.

DATE: September 1997

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

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)									
	19,528	33,623	0	0	0	0	0	0	120,706
Current Program Value 19,697									

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 (aircrew training) and deployable (ship/sub/aircrew training) applications. A two phase approach was developed to separate the hardware and software portions of the program into manageable units to support Low Rate Initial Production (LRIP). 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 was 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 builds on technology developed for Large Area Tracking Range, and the capabilities developed for the in-port Battle Force Tactical Trainer program. JTCTS incorporates the Defense Modeling and Simulation Office’s Higher Level Architecture 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 to a single phase of development that will deliver development hardware/software for a Carrier Air Group (CAG)-5 capability after undergoing development testing. This single phase of development will combine the necessary portions of the originally planned phase 1 and 2 development to provide an Air Combat System Subset of the operational requirements and the originally planned system as stated above.

DATE: September 1997

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

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

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) ($14,245) 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).
-
- (U) This submission does not reflect $167 thousand that was reprogrammed into the line for EDM development and $2 thousand reserved for economic recission.

2. (U) FY 1998 PLAN:

- (U) ($23,800) Complete software/hardware development, integration development testing and hardware
- manufacturing. Support government development testing.
- (U) ($9,823) Monitor software development hardware/software integration, development testing and hardware manufacturing. Begin/complete government development testing. Prepare platform site for integration development testing.

DATE: September 1997

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0204571N PROGRAM ELEMENT TITLE: Consolidated Training Systems Development

PROJECT NUMBER: W1998 PROJECT TITLE: Joint Tactical Combat Training System (JTCTS)

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1997	FY 1998	FY 1999
(U) FY 1998 President's Budget:	19,973	33,623	23,765
(U) Appropriated Value:	20,946		
(U) Adjustments from PRESBUDG:	-445	0	-23,765
(U) FY 1999 OSD/OMB Budget Submit	19,528	33,623	0

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY97 decrease of $445 thousand reflects $419 thousand for a Small Business Innovation Research Assessment and $26 thousand for Economic Assumption Adjustments. The FY99 decrease of -$23,765 thousand reflects cancellation of the JTCTS program.

(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/Tech Eval 3Q/99-4Q/99

DATE: September 1997

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

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

B. (U) PROGRAM CHANGE SUMMARY: Schedule Cont.

The following milestones have been cancelled:

Initial Production Decision 1Q/99
OPEVAL 4Q/99-4Q/00
LRIP Contract Award 2Q/99
MS III 2Q/01
Techeval 3Q/00

(U) Technical: Not Applicable.

B. (U) PROGRAM CHANGE SUMMARY:

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 #130	0	0	0	0	0	0	0	0	0
(U) APN/P-1 #52	0	0	0	0	0	0	0	0	0

DATE: September 1997

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

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

B. (U) PROGRAM CHANGE SUMMARY:

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

D. (U) SCHEDULE PROFILE:

	FY 1997	FY 1998	FY 1999	TO COMPLETE
Program Milestones				
Engineering Milestones	CDR 2Q			
T&E Milestones		Contractor laboratory testing 3Q/98-2Q/99	Contractor acceptance testing 3Q/99-4Q/99 DT/TECHEVAL 3Q/99-4Q/99	
Contract Milestones				

DATE: September 1997

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

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

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

Project Cost Categories	FY 1997	FY 1998	FY 1999
a. EDM #1/#2 Development	14,245	23,800	0
b. Government Engineering & Technical Support	4,004	7,723	0
c. Engineering & Technical Services	1,193	1,950	0
d. Travel	86	150	0
Total	19,528	33,623	0

DATE: September 1997

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

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

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total* FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development										
Raytheon 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	78,781	78,781	40,736	14,245	23,800	0	0	78,781
NAWC AD PAX	WX	1Q/99	18,980	18,980	12,724	2,333	3,923	0		18,980
Miscellaneous	WX	N/A	4,940	4,940	4,243	697	0	0	0	4,940
Support and Management										
Miscellaneous RCP		1Q/99	9,095	9,095	5,952	1,193	1,950	0	0	9,095
Test & Evaluation:										
NAWC AD PAX	WX	1Q/99	5,010	5,010	0	1,060	3,950	0	0	5,010

GOVERNMENT FURNISHED PROPERTY Not Applicable.

*This includes FY90-FY96.

DATE: September 1997

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

BUDGET ACTIVITY: 7
PROGRAM ELEMENT: 0204571N
PROGRAM ELEMENT TITLE: Consolidated Training Systems Development
PROJECT NUMBER: W1998
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	17,275	27,723	0	0	106,601
Subtotal Support and Management	5,952	1,193	1,950	0	0	9,095
Subtotal Test and Evaluation	0	1,060	3,950	0	0	5,010
Total Project	67,555	19,528	33,623	0	0	120,706

DATE: September 1997

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

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 ESTIIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
W2124 Air Warfare Training Development (AWTD)	1,716	2,106	2,087	2,214	2,272	2,036	2,288	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. Develop 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 testbed 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.

DATE: September 1997

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 7
PROGRAM ELEMENT: 0204571N
PROGRAM ELEMENT TITLE: Consolidated Training Systems Development
PROJECT NUMBER: W2124
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 testbed 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) ($400) Integrate display, image generator, and effects modeling systems.
- (U) ($867) Reach Initial Operational Capability (IOC) for ATTIF for F-14 prototype demonstrations.

3. (U) FY 1999 PLAN:

- (U) ($710) Demonstrate F-14 concept mission rehearsal system and evaluate.
- (U) ($640) Reach IOC for ATTIF for AV-8B transportable concept demonstration evaluation.
- (U) ($737) Demonstrate and evaluate AV-8B concept transportable mission rehearsal system.

DATE: September 1997

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 7
PROGRAM ELEMENT: 0204571N
PROGRAM ELEMENT TITLE: Consolidated Training Systems Development
PROJECT NUMBER: W2124
PROJECT TITLE: Air Warfare Training Development (AWTD)

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1997	FY 1998	FY 1999
(U) FY 1998/1999 President's Budget:	1,743	2,106	2,113
(U) Appropriated Value:	1,666		
(U) Adjustments from PRESBUDG:	- 27	0	-26
(U) FY 1999 OSD/OMB Budget Submit:	1,716	2,106	2,087

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY 97 adjustment of -$27 thousand reflects a Small Business Innovation Research Assessment. The FY 99 adjustment of -$26 thousand reflects $25 thousand for Navy Working Capital Fund adjustments and $1 thousand for a minor program adjustment.

(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

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
0	0	0	1,000	7,000	5,000	5,000	CONT.	CONT.

DATE: September 1997

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 7
PROGRAM ELEMENT: 0204571N
PROGRAM ELEMENT TITLE: Consolidated Training Systems Development
PROJECT NUMBER: W2124
PROJECT TITLE: Air Warfare Training Development (AWTD)

(U) RELATED RDT&E: Not Applicable.

D. (U) SCHEDULE PROFILE:

	FY 1997	FY 1998	FY 1999	TO COMPLETE
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			

DATE: September 1997

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

BUDGET ACTIVITY: 7
PROGRAM ELEMENT: 0204571N
PROGRAM ELEMENT TITLE: Consolidated Training Systems Development
PROJECT NUMBER: W2124
PROJECT TITLE: Air Warfare Training Development (AWTD)

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

Project Cost Categories	FY 1997	FY 1998	FY 1999
a. Primary Hardware Development	1,332	1,370	600
b. Governmnent Engineering Support	353	480	328
c. Developmental Test and Evaluation	0	225	1,128
d. Travel	31	31	31
Total	1,716	2,106	2,087

DATE: September 1997

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

BUDGET ACTIVITY: 7
PROGRAM ELEMENT: 0204571N
PROGRAM ELEMENT TITLE: Consolidated Training Systems Development
PROJECT NUMBER: W2124
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	1,205	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	1,421	CONT.	CONT.

GOVERNMENT FURNISHED PROPERTY: NOT APPLICABLE

DATE: September 1997

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

BUDGET ACTIVITY: 7
PROGRAM ELEMENT: 0204571N
PROGRAM ELEMENT TITLE: Consolidated Training Systems Development
PROJECT NUMBER: W2124
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	1,205	635	CONT.	CONT.
Subtotal Support and Management	1,297	31	31	31	CONT.	CONT.
Subtotal Test and Evaluation	0	380	870	1,421	CONT.	CONT.
Total Project	6,164	1,716	2,106	2,087	CONT.	CONT.

DATE: September 1997

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

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
X1823 Training and Training Devices Systems (TTDS)	1,481	1,323	1,639	0	0	0	0	0	15,856*

* This amount includes FY92-FY99.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The employment of naval forces in a multi-dimensional warfare environment is a complex operational problem. To counter the threat expected in hostile environments, naval officer training must be provided for all mission areas on a real-time basis at the Battle Force/Group level. This training must focus on tactical decision-making, tactics development/evaluation, and operational planning/execution. Shore-based classroom training and at-sea exercises have historically satisfied the Battle Group tactical training requirement. However, the effectiveness of this approach to training was reduced by the lack of a real-time decision-making environment during shore-based training and the reduction in number and scope of at-sea exercises. Training and Training Devices Systems is composed of the Enhanced Naval Warfare Gaming System (ENWGS).

ENWGS provides the decision-making environment and is a critical portion of the training that Battle Group Commanders and their supporting Warfare Commanders receive prior to deployment. ENWGS provides development of an enhanced wargaming/simulation capability to provide training to Battle Group Commanders and associated Warfare Commanders. ENWGS is a geographically distributed wargaming system that supports the needs and objectives of the Fleet Commanders. Through computer simulation, ENWGS assists tactical commanders in planning, executing, and evaluating Fleet operations and exercises. ENWGS also provides the ability to test the Battle Groups Operation Orders, providing the essential supplement to at-sea operations, prior to deployment. During FYs 95-97, ENWGS will complete its conversion to an open systems architecture to provide software portability (Release 5.0) and lead to the development of the capability to provide exercise scenarios for other Navy models (Release 6.0).

DATE: September 1997

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 7
PROGRAM ELEMENT: 0204571N
PROGRAM ELEMENT TITLE: Consolidated Training Systems Development
PROJECT NUMBER: X1823
PROJECT TITLE: Training and Training Devices Systems (TTDS)

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) ($1,437) Conducted ENWGS R5.0 In Process Reviews (IPRs) and Critical Design Reviews. Performed Development Testing (DT) and Operational Testing (OT) on ENWGS R5.0. Completed and fielded R5.0. Commenced the development of ENWGS R6.0, Build 1 (technical enhancements to support interoperability with 2-way Link 11, Link 16 and OTH-T, and improved functionality in the following areas: DIS ENWGS Interface Unit (EIU) upgrade; model modernization; mine warfare; littoral warfare) and Build 2 (continue improvements to 2-way Link 11, Link 16 and OTH-T, and improved functionality in the following areas: DIS/HLA; DIS EIU PDUs; mine warfare; national sensors and satellites; post game analysis; and JMCIS segment integration). Conducted R6.0 Builds 1 and 2 PDR and IPRs. Awarded new ENWGS IV&V and Test and Evaluation contract.

- (U) ($44) Developed and updated Naval Command, Control, Communications, Computers, Intelligence, Sensors and Reconnaissance (C4ISR) implementation guidance. Developed and updated Naval C4ISR mission to incorporate an overarching operational, systems, technical, and information architectures. Conducted associated C4ISR analyses and studies.

3. (U) FY 1998 PLAN:

- (U) ($1,299) Continue ENWGS R6.0, Builds 1 and 2, development. Conduct IPRs. Perform DT and OT for R6.0, Build 1. Complete and field test R6.0, Build 1.

- (U) ($24) 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 operation, systems, technical and information architectures. Conduct associated C4ISR analyses and studies.

4. (U) FY 1999 PLAN:

- (U) ($1,669) Continue ENWGS R6.0, Build 2, development. Conduct IPRs for R6.0, Build 2. Perform DT and OT for R6.0, Build 2. Complete and field integrated R6.0. Integrate Builds 1 and 2 and perform DT and OT for R6.0, integrated Builds 1 and 2.

DATE: September 1997

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0204571N PROGRAM ELEMENT TITLE: Consolidated Training Systems Development

PROJECT NUMBER: X1823 PROJECT TITLE: Training and Training Devices Systems (TTDS)

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1997	FY 1998	FY 1999
(U) FY 1998/1999 President's Budget:	1,515	1,323	1,666
(U) Appropriated Value:	1,515		
(U) Adjustment from Pres. Budget:	-34	0	-27
(U) FY 1999 OSD/OMB Budget Submit:	1,481	1,323	1,632

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY97 decrease of -$34 thousand reflects a Small Business Innovation Reasearch Assessment. The FY99 decrease is funds redirected to develop and update overarching C4ISR mission requirements.

(U) Schedule: Not Applicable

(U) Technical: Not Applicable

DATE: September 1997

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 7
PROGRAM ELEMENT: 0204571N
PROGRAM ELEMENT TITLE: Consolidated Training Systems Development
PROJECT NUMBER: X1823
PROJECT TITLE: Training and Training Devices Systems (TTDS)

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

	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
(U) OPN LI #2760	1,541	947	1,066	4	4	4	4	CONT.	CONT.
(U) OMN AG/SAG 1C4C	2,135	1,848	1,919	1,954	1,969	2,007	2,053	CONT.	CONT.

(U) RELATED RDT&E: Not applicable.

DATE: September 1997

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 7
PROGRAM ELEMENT: 0204571N
PROGRAM ELEMENT TITLE: Consolidated Training Systems Development
PROJECT NUMBER: X1823
PROJECT TITLE: Training and Training Devices Systems (TTDS)

D.(U) SCHEDULE PROFILE:

	FY 1997	FY 1998	FY 1999	TO COMPLETE
Program Milestones	ENWGS Release 5.0	ENWGS Release 6.0 Build 1	ENWGS Release 6.0 Build 2 ENWGS Release 6.0 Integ. Build 1 & 2	
Engineering Milestones	ENWGS Release 5.0 IPRs & CDRs ENWGS Release 6.0 PDR & IPRs	ENWGS Release 6.0 Build 1 IPRS	ENWGS Release 6.0 Build 2 IPRs ENWGS Release 6.0 Integ. Build 1 & 2	
T&E Milestones	ENWGS Release 5.0 DT & OT	ENWGS Release 6.0 Build 1 DT & OT	ENWGS Release 6.0 Build 2 DT & OT ENWGS Release 6.0 Integ. Build 1 & 2 DT & OT	
Contract Milestones	Award new ENWGS IV&V & T&E Contract			

DATE: September 1997

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N
PROGRAM ELEMENT TITLE: Consolidated Training Systems Development

(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
X1823 Training and Training Devices Systems (TTDS)	1,420	900	0	0	0	0	0	0	14,190*

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The employment of naval forces in a multi-dimensional warfare environment is a complex operational problem. To counter the threat expected in hostile environments, naval officer training must be provided for all mission areas on a real-time basis at the Battle Force/Group level. This training must focus on tactical decision-making, tactics development/evaluation, and operational planning/execution. Shore-based classroom training and at-sea exercises have historically satisfied the Battle Group tactical training requirement. However, the effectiveness of this approach to training was reduced by the lack of a real-time decision-making environment during shore-based training and the reduction in number and scope of at-sea exercises. Training and Training Devices Systems is composed of the Enhanced Naval Warfare Gaming System (ENWGS).

ENWGS provides the decision-making environment and is a critical portion of the training that Battle Group Commanders and their supporting Warfare Commanders receive prior to deployment. ENWGS provides development of an enhanced wargaming/simulation capability to provide training to Battle Group Commanders and associated Warfare Commanders. ENWGS is a geographically distributed wargaming system that supports the needs and objectives of the Fleet Commanders. Through computer simulation, ENWGS assists tactical commanders in planning, executing, and evaluating Fleet operations and exercises. ENWGS also provides the ability to test the Battle Groups Operation Orders, providing the essential supplement to at-sea operations, prior to deployment. During FYs 95-97, ENWGS will complete its conversion to an open systems architecture to provide software portability (Release 5.0).

* This amount includes FY92-FY98.

DATE: September 1997

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 7
PROGRAM ELEMENT: 0204571N
PROGRAM ELEMENT TITLE: Consolidated Training Systems Development
PROJECT NUMBER: X1823
PROJECT TITLE: Training and Training Devices Systems (TTDS)

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) ($1,420) Conducted ENWGS R5.0 IPRs and Critical Design Reviews. Performed Development Testing (DT) and Operational Testing (OT) on ENWGS R5.0. Completed and fielded R5.0 Build 1 (TAC-4 Workstation Game Play). Awarded new ENWGS IV&V and Test and Evaluation contract.

2. (U) FY 1998 PLAN:

- ($900) Commence development of ENWGS R5.0, Build 2 (TAC-4 Workstation Game Play and Game preparation) including technical enhancements to support interoperability with operational interfaces (Link 11, OTH-Gold) and Build 3 (TAC 4 Workstation Post Game Analysis). Integrate builds 1,2 & 3.

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

DATE: September 1997

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 7
PROGRAM ELEMENT: 0204571N
PROGRAM ELEMENT TITLE: Consolidated Training Systems Development
PROJECT NUMBER: X1823
PROJECT TITLE: Training and Training Devices Systems (TTDS)

.

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1997	FY 1998	FY 1999
(U) FY 1998 President's Budget:	1,515	1,323	1,666
(U) Appropriated Value:	1,515		
(U) Adjustment from Pres. Budget:	-95	-423	-1,666
(U) FY 1999 OSD/OMB Budget Submit:	1,420	900	0

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1997 Adjustment of -$34K for SBIR Transfer, minor adjustment of -$54K to finance other Department requirements, and -$7K inflation adjustment. Adjustments were made for FY 1998 and FY 1999 to finance Other Navy Department requirements in the amounts of -$423K and -$1,666, respectively.

(U) Schedule: Not Applicable.

(U) Technical: Not Applicable.

DATE: September 1997

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 7
PROGRAM ELEMENT: 0204571N
PROGRAM ELEMENT TITLE: Consolidated Training Systems Development
PROJECT NUMBER: X1823
PROJECT TITLE: Training and Training Devices Systems (TTDS)

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

	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
(U) OPN LI #2760	1,536	947	1,066	4	4	4	4	CONT.	CONT.
(U) OMN AG/SAG 1C4C	2,107	1,848	1,919	1,954	1,969	2,007	2,053	CONT.	CONT.

(U) RELATED RDT&E: Not applicable.

DATE: September 1997

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 7
PROGRAM ELEMENT: 0204571N
PROGRAM ELEMENT TITLE: Consolidated Training Systems Development
PROJECT NUMBER: X1823
PROJECT TITLE: Training and Training Devices Systems (TTDS)

D.(U) SCHEDULE PROFILE:

	FY 1997	FY 1998	TO COMPLETE
Program Milestones	ENWGS Release 5.0 Build 1	ENWGS Release 5.0 Builds 2 & 3 Integ. Builds 1,2&3	
Engineering Milestones	ENWGS Release 5.0 Build 1 IPRs & CDRs	ENWGS Release 5.0 Builds 2&3 IPRs & CDRs	
T&E Milestones	ENWGS Release 5.0 DT & OT	ENWGS Release 5.0 Builds 2&3 DT & OT	
Contract Milestones	Award new ENWGS IV&V & T&E Contract		

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2) DATE: September 1997

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

(U) COST: (in millions)

PROJECT NUMBER & TITLE	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	COST TO COMPLETE	TOTAL COST
Z2263 Information Warfare Systems	1.2	1.6	3.8	5.1	6.0	6.1	6.2	CONT.	CONT.

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 new start 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
- o (U) ($1,091) Develop Joint Maritime Command Information Strategy (JMCIS) based IMPACTS.
- o (U) ($149) Initiate study to develop system-specific requirements for Naval Deception capabilities.

FY 1998
- o (U) ($650) Continue development of offensive IW capabilities. Add additional counter-C2 capabilities for existing systems.
- o (U) ($846) Continue developing and updating IMPACTS.
- o (U) ($130) Continue with design specifications for Naval Deception capabilities.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2) DATE: September 1997

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

FY 1999
- o (U) ($990) Initiate development of JMCIS-complaint synthetic radio frequency environmental modeling tool.
- o (U) ($1,850) Continue developing and updating IMPACTS.
- o (U) ($100) Continue and deliver final design specification for Naval IW Deception capability.
- o (U) ($841) Initiate effort to standardize data bases and human-machine interfaces between IMPACTS segments to increase the level of interoperability and commonality.

FY 2000
- o (U) ($1,000) Continue development of JMCIS-complaint synthetic radio frequency environmental modeling tool.
- o (U) ($1,084) Complete standardization of databases and HMI between IMPACTS Segments to increase level of interoperability and commonality
- o (U) ($1,000) Initiate development of interim IW Deception and PSYOP systems.
- o (U) ($2,000) Initiate design of long term common hardware/software system for future EA, PSYOP and Deception efforts. Ensure system employs on-platform TX/RX components to maximum extent possible and allows for remote-control. System should be integrated into platform components planned for FY01-03 timeframe.

B. (U) PROGRAM CHANGE SUMMARY:

	FY 97	FY 98	FY 99	FY 00
FY 1998 President's Budget:	1.651	1.626	3.766	5.084
FY 1997 Appropriated:	1.583			
FY 1999 OSD Review:	1.240	1.626	3.781	5.084
Change from Appropriated/Pres Budget:	(.411)	0	15	0

Note: Functional Transfer FY98 to: Naval Information Warfare Activity BSO: NSMA

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2) DATE: September 1997

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

(U) CHANGE SUMMARY EXPLANATION:

Funding: FY 1997 adjustment is due to NWCF rescission (-33), general Congressional reductions (-68), SBIR reduction (-41) and and a minor reprogramming (-300). FY 1999 increase for NWCF surcharge correction (+15).

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 COMPLETE	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	5.1	4.4	5.5	6.7	7.0	7.1	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.

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3) DATE: September 1997

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

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

Project Cost Categories	FY 1997	FY 1998	FY 1999	FY 2000
a. Software Development	1,100	1,496	3,666	4,984
b. Miscellaneous	140	130	115	100
TOTAL	1,240	1,626	3,781	5,084

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	1,626	3 ,781	5,084	CONT.	CONT.

Support and Management: Not applicable

Test and Evaluation: Not applicable

GOVERNMENT FURNISHED PROPERTY: Not applicable

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3) DATE: September 1997

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	1,626	3,781	5,084	CONT.	CONT.
SUBTOTAL SUPPORT AND MANAGEMENT	0	0	0	0	0	0	0
SUBTOTAL TEST AND EVALUATION	0	0	0	0	0	0	0
TOTAL PROGRAM	0	1,240	1,626	3,781	5,084	CONT.	CONT.

C. (U) FUNDING PROFILE: Not applicable

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

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	5,089	7,205	11,729	9,787	7,244	1,874	0	47,624
W2185 Advanced Anti-Radiation Guided Missile (AARGM)	32,620	0	0	0	0	0	0	0	32,620*
W2211 Joint Advanced Weapons System (JAWS) (Army Lead)	889	1,080	1,007	0	0	0	0	0	3,909
TOTAL	35,783	6,169	8,212	11,729	9,787	7,244	1,874	0	84,153

*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 congressionally-mandated 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 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.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

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	5,089	7,205	11,729	9,787	7,244	1,874	0	47,624

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.

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) ($2,414) 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) ($345) Continue weapons system upgrade studies assessing weapon service life, missile performance, deficiencies, and logistics requirements.

- (U) ($775) 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) ($565) 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.

- (U) ($755) 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).

- (U) ($155) Initiate Government logistic support efforts for the HARM Upgrade Program (Block VI) including initial logistics support analysis and plans development.

3. (U) FY 1999 PLAN:

- (U) ($1,734) 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) ($700) Continue Engineering and Project Management Services in support of the HARM Upgrade Program (Block VI) contract.

- (U) ($1,011) 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.

- (U) ($1,117) Initiate installation by Government personnel of Block V Software in HARM Missiles at field sites.

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1997	FY 1998	FY 1999
(U) FY 1998 President's Budget:	2,293	5,089	7,448
(U) Appropriated Value:	2,395		
(U) Adjustments from PRESBUDG:	-19		-243
(U) FY 1999 OSD/OMB Budget Submit:	2,274	5,089	7,205

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY97 decrease of -$19 thousand reflects -$16 thousand SBIR reduction and -$3 thousand decrease for Supplemental Economic Adjustment. The FY99 decrease of -$243 thousand reflects a -$61 thousand Navy Working Capital Fund surcharge, a -$10 thousand minor pricing adjustment, a net decrease of -$306 decrease for Block VI Upgrade adjustment, +134 thousand for minor balancing adjustments.

(U) Schedule: No changes.

(U) Technical: No changes.

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) WPN HARM MODS	0	0	0	0	0	0	11,406	38,040	49,446

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0205601N PROJECT NUMBER: W1780
PROGRAM ELEMENT TITLE: HARM Improvement PROJECT TITLE: HARM Improvement

(U) RELATED RDT&E: Not applicable

D. (U) SCHEDULE PROFILE:

	FY 1997	FY 1998	FY 1999	TO COMPLETE
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 November 1997.

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

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: September 1997

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205601N
PROGRAM ELEMENT TITLE: HARM Improvement

PROJECT NUMBER: W1780
PROJECT TITLE: HARM Improvement

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

Project Cost Categories	FY 1997	FY 1998	FY 1999
a. Engineering Services	1,321	2,154	4,359
b. Test and Evaluation	520	1,905	1,861
c. Furnished Equipment	243	0	0
d. Management Support	110	950	900
e. Travel	80	80	85
Total	2,274	5,089	7,205

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: September 1997

BUDGET ACTIVITY: 7
PROGRAM ELEMENT: 0205601N
PROGRAM ELEMENT TITLE: HARM Improvement
PROJECT NUMBER: W1780
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	30,306	30,306	742	1,088	1,999	1,234	25,243	30,306
NAWC/Point Mugu	WX	11/98	1,572	1,572	0	0	155	1,417	0	1,572
NAWC/China Lake	WX	6/99	1,708	1,708	0	0	0	1,708	0	1,708
Miscellaneous										
(In-house)	WX	Var	763	763	45	313	80	85	240	763
(Contractor)	C/CPFF	1/99	1,100	1,100	1,100	0	0	0	0	1,100
Support and Management										
Miscellaneous	C/CPFF	VAR	4,370	4,370	110	110	950	900	2,300	4,370
Test and Evaluation										
NAWC/China Lake	WX	11/98	7,259	7,259	122	520	1,905	1,861	2,851	7,259

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									
Targets	WX	11/96	11/97	303	243	0	0	0	546

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: September 1997

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205601N
PROGRAM ELEMENT TITLE: HARM Improvement

PROJECT NUMBER: W1780
PROJECT TITLE: HARM Improvement

	Total FY 1996 and Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Subtotal Production Development	1,887	1,401	2,234	4,444	25,483	35,449
Subtotal Support and Management	110	110	950	900	2,300	4,370
Subtotal Test and Evaluation	425	763	1,905	1,861	2,851	7,805
Total Project	2,422	2,274	5,089	7,205	30,634	47,624

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: September 1997

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	1,080	1,007	0	0	0	0	0	3,909

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 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.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

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) ($1,080) 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 $680K Government In-House)

3. (U) FY 1999 PLAN:

- (U) ($1,007) 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 $587K Government In-House)

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

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:

	FY 1997	FY 1998	FY 1999
(U) FY 1998 President's Budget Submit:	914	1,080	988
(U) Appropriated Value:	953		
(U) Adjustment from PRESBUDG Submit:	-25		+19
(U) FY 1999 OSD/OMB BUDGET SUBMIT:	889	1,080	1,007

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: The -$25 thousand decrease to FY97 reflects a -$24 thousand adjustment for Small Business Innovation Research and a -$1 thousand decrease for the Supplemental Revised Economic Adjustment. The net increase of +$19 thousand in FY 1999 reflects a minor balancing of -$1 thousand and a Navy Working Capital Fund Adjustment of +$20 thousand.

(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.

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: September 1997

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0205601N PROJECT NUMBER: W2211
PROGRAM ELEMENT TITLE: HARM Improvement PROJECT NAME: Joint Advanced Weapons Systems (JAWS)

A. (U) PROJECT COST BREAKDOWN: Not Applicable

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION: Not Applicable

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

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	2,596	4,517	4,329	4,342	10,044	8,907	CONT.	CONT.
P1753 LINK-11 Improvements	1,567	0	0	0	0	0	0	0	0
P1977 Navy JTIDS	5,873	0	0	0	0	0	0	0	552,113
P2126 ATDLS Integration	27,257	38,779	46,884	32,379	23,672	18,123	19,707	CONT.	CONT.
TOTAL	34,697	41,375	51,401	36,708	28,014	28,167	28,614	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.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

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.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

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	2,596	4,517	4,329	4,342	10,044	8,907	CONT.	CONT.

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.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

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) ($1,304) 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) ($3,381) Begin development of U.S. implementation of LINK-22 including CDL MS/CSDTS upgrades.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

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:

	FY 1997	FY 1998	FY 1999
(U) FY 1998 President's Budget:	102	2,596	4,534
(U) Appropriated Value:			
(U) Adjustments from FY 1998 President's Budget:	-102	0	-17
(U) FY 1999 OSD/OMB Budget Submit:	0	2,596	4,517

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding:

FY97: Below threshold reprogramming to Project Unit P1977 (-$102K).

FY99: Navy Working Capital Fund rate adjustments (-$17K).

(U) Schedule: Not Applicable.

(U) Technical: Not Applicable.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

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)

	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
OPN Line #02614	16,355	16,991	34,194	27,525	26,657	31,464	36,211	TBD	TBD

(U) RELATED RDT&E: N/A

D. (U) SCHEDULE PROFILE:

	FY 1997	FY 1998	FY 1999	TO COMPLETE
Program Milestones				
Engineering Milestones				
T&E Milestones		NRS Test 3Q/98		Link-22 DT/OT 3Q/01
Contract Milestones				

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: September 1997

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	FY 1997	FY 1998	FY 1999
a. NATO Improved Link Eleven		1,292	1,136
b. LINK-22		1,304	3,381
c. C2P Improvements			
Total	0	2,596	4,517

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: September 1997

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)

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
PERFORMING ORGANIZATIONS										
Product Development										
NRL							450	490		
NCCOSC R&D Div/ San Diego, CA	WX				0	0	1,876	3,569	Cont.	Cont.
	C2P ONLY		63,089	63,089	63,473	0				
All Other Product Development					0	0	0	0	0	3,028
Support and Management										
	C2P ONLY		18,443	18,433	18,433					
All Other Support and Management					0	0	270	458	Cont.	Cont.
Test and Evaluation										
	C2P ONLY		11,324	11,324	11,354					
All other Test and Evaluation					0	0	0	0	0	3,881
Subtotal PERFORMING ORGANIZATIONS					93,260	0	2,596	4,517	Cont.	Cont.

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: September 1997

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0205604N PROJECT NUMBER: P1743
PROGRAM ELEMENT TITLE: Tactical Data Links PROJECT TITLE: LINK-16 Improvements

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
GOVERNMENT FURNISHED PROPERTY									
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
Subtotal GOVERNMENT FURNISHED PROPERTY				0	0	0	0	0	0
Subtotal Product Development				63,473	0	2,326	4,059	Cont.	Cont.
Subtotal Support and Management				18,433	0	270	458	Cont.	Cont.
Subtotal Test and Evaluation				11,354	0	0	0	0	11,354
Total Project				93,260	0	2,596	4,517	Cont.	Cont.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

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
P1753 LINK-11 Improvements	1,567	0	0	0	0	0	0	0	N/A

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.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

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) ($524) Began efforts of subphase 2 for the NILE Reference System.
- (U) ($1,043) Continued preparing for U.S. implementation of LINK-22.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

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:

	FY 1997	FY 1998	FY 1999
(U) FY 1998 President's Budget:	2,214	0	0
(U) Appropriated Value:			
(U) Adjustments from FY 1998 President's Budget:	-647	0	0
(U) FY 1999 OSD/OMB Budget Submit:	1,567	0	0

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding:

FY97: Below threshold reprogramming (-$435K), adjustment for ID friend (-$100K), congressional rescission for Passenger safety modification (-$94K), transfer of SBIR (-$15K), and inflation adjustment (-$3K).

(U) Schedule: Not Applicable.

(U) Technical: Not Applicable.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0205604N PROJECT NUMBER: P1753
PROGRAM ELEMENT TITLE: TACTICAL DATA LINKS PROJECT TITLE: LINK-11 Improvements

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

	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
OPN Line #02660	2,760	0	0	0	0	/A	

(U) RELATED RDT&E: N/A

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0205604N PROJECT NUMBER: P1753
PROGRAM ELEMENT TITLE: TACTICAL DATA LINKS PROJECT TITLE: LINK-11 Improvements

D. (U) SCHEDULE PROFILE:

	FY 1997	TO COMPLETE
Program Milestones		
Engineering Milestones		
T&E Milestones		
Contract Milestones	NRS Contract Award 3Q/97	

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0205604N PROJECT NUMBER: P1977
PROGRAM ELEMENT TITLE: TACTICAL DATA LINKS 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	5,873	0	0	0	0	0	N/A

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 Distribution System

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

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0205604N PROJECT NUMBER: P1977
PROGRAM ELEMENT TITLE: TACTICAL DATA LINKS PROJECT TITLE: Navy JTIDS

development required to accommodate expanded LINK-16 operational capabilities for additional warfare areas; and (3) the development of automated network management aids.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

(U) ($594) Continued joint certification implementation and testing.

(U) ($1,975) Conducted LINK-16 ACDS BLK 1 and AEGIS Model 5 testing.

(U) ($701) Continued Tadil J Network implementation.

(U) ($1,646) Completed FOT&E.

(U) ($957) Continued implementation of OPSPEC chg 4.

NOTE: Continuing LINK-16 implementation will be funded in P2126 (ATDLS Integration) commencing in FY 1997.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0205604N PROJECT NUMBER: P1977
PROGRAM ELEMENT TITLE: TACTICAL DATA LINKS PROJECT TITLE: Navy JTIDS

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1997	FY 1998	FY 1999
(U) FY 1998 President's Budget:	5,795	0	0
(U) Appropriated Value:			
(U) Adjustments from FY 1998 President's Budget	+78	0	0
(U) FY 1999 OSD/OMB Budget Submit:	5,873	0	0

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding:

FY97: FFRDC adjustments (-$17K), transfer of SBIR (-$42K), inflation adjustment (-$7K), and below threshold reprogramming (+$144K).

(U) Schedule: Not Applicable.

(U) Technical: Not Applicable.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0205604N PROJECT NUMBER: P1977
PROGRAM ELEMENT TITLE: Tactical Data Links PROJECT TITLE: NAVY JTIDS

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

	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
BA-1 APN #052500	4,088	3,066	4,008	4,008	4,008	CONT.	CONT.
BA-5 APN #054400	1,488	1,520	1,553	1,588	0	CONT.	CONT.
OPN Line #02614	16,355	16,991	34,194	27,525	26,657	CONT.	CONT.
SCN	9,444	9,729	10,020	10,320	10,629	CONT.	CONT.

(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:

	FY 1997	TO COMPLETE
Program Milestones		
Engineering Milestones		
T&E Milestones	OT-IIIB 3/97	
Contract Milestones		

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

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
P2126 ATDLS Integration	27,257	38,779	46,884	32,379	23,672	18,123	19,707	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^3I) 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.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

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) ($22,685) 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.

3. (U) FY 1998 PLAN:

- (U) ($33,203) 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) Complete MIDS-LVT shipboard implementation.

4. (U) FY 1999 PLAN:

- (U) ($36,181) 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).

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0205604N PROJECT NUMBER: P2126
PROGRAM ELEMENT TITLE: Tactical Data Links PROJECT TITLE: ATDLS Integration

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1997	FY 1998	FY 1999
(U) FY 1998 President's Budget:	27,463	38,779	40,907
(U) Appropriated Value:			
(U) Adjustments from FY 1998 President's Budget:	-206	0	5,977
(U) FY 1999 OSD/OMB Budget Submit:	27,257	38,779	46,884

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding:

FY97: Below threshold reprogramming (+$393K), inflation adjustment (-$32K), transfer of SBIR (-558K), and FFRDC adjustment (-$9K).

FY99: Net adjustment of funding realignment for MIDS F/A-18 Integration (+$5,900), and Navy working capital fund rate adjustment (+$77K).

(U) Schedule: Not Applicable.

(U) Technical: Not Applicable.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

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)

	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
APN LINE									
# 052500	0	0	32,944	69,909	64,660	56,633	53,650	185,900	463,696
# 054400	1,931	821	760	772	780	803	818	TBD	TBD
RDT&E DA	37,035	52,238	28,192	12,620	12,880	13,156	13,485	TBD	TBD
OPN Ln #2614	16,355	16,991	34,194	27,525	26,657	31,464	36,211	TBD	TBD
SCN	9,000	7,700	9,400	10,700	8,700	11,500	6,400	TBD	TBD

(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) - JTIDS: Funding develops and procures the Navy’s JTIDS and MIDS Engineering and Manufacturing Development (EMD) terminals.

(U) PE (0604771D) - MIDS: MIDS-LVT terminal development.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0205604N PROJECT NUMBER: P2126
PROGRAM ELEMENT TITLE: Tactical Data Links PROJECT TITLE: ATDLS Integration

D. (U) SCHEDULE PROFILE:

	FY 1997	FY 1998	FY 1999	TO COMPLETE
Program Milestones		DAB IIIA 4Q/98 MS IIIB 4Q/98 (FRP)		IOC 2Q/01
Engineering Milestones				
T&E Milestones		OT-IIID2 2/98 DT-IIIC2 6/98 Ship DT/OT-IIB-1 2Q/98 Ship DT/OT-IIB-2 3Q/98	F/A-18 OT-IIA-3 3Q/99 OT-IIA-2 1Q/99 DT-IIA-3 1Q/99 DT-IIA-4 1Q/99 DT-IIA-5 3Q/99	F/A-18 TECHEVAL 1Q/01 F/A-18 OPEVAL 3Q/01 Ship/Sub FOT&E 3Q/00 F/A-18 FOT&E 2Q/02 PLATFORM DT/OT 02/03
Contract Milestones				

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: September 1997

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	FY 1997	FY 1998	FY 1999
a. Systems Engineering	3,088	3,096	2,641
b. Integration	21,343	26,821	30,205
c. Test and Evaluation	2,826	8,862	9,480
d. OPSPEC 5516.3	0	0	4,558
Total	27,257	38,779	46,884

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: September 1997

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 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
PERFORMING ORGANIZATIONS										
Product Development										
McDonnell Douglas	SS/CPIF	Nov 95	56,589	56,589	22,230					
		Nov 96				8,769				
		Nov 97					11,200			
		Nov 98						11,000	Cont.	Cont.
NCCOSC R&D Div Det/ Warminster, PA	WX	Nov 95	6,835	6,835	4,957					
		Nov 96				0	0	0	0	6,835
NCCOSC R&D Div/ San Diego, CA	WX	Nov 95	49,374	49,374	7,070					
		Nov 96				3,907				
		Nov 97					3,096			
		Nov 98						9,518	Cont.	Cont.

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: September 1997

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 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
PERFORMING ORGANIZATIONS (Continued:)										
Product Development (Continued:)										
NAVAIRWARCENWPNDIV/ China Lake, CA	WX	Dec 95	37,981	37,981	16,431					
		Dec 96				4,000				
		Dec 97					7,940			
		Dec 98						7,650	Cont.	Cont.
GEC Marconi Electronic Systems Corp, Wayne NJ	SS/CPFF	Nov 95	6,450	6,450	1,118					
		Nov 96				3,000				
		Nov 97					3,200	1,700	0	Cont.
All Other Product Development			50,909	50,909	26,471	3,809	3,215	4,732	Cont.	Cont.
Subtotal Product Development			208,138	208,138	78,277	23,485	28,651	34,600	Cont.	Cont.

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: September 1997

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0205604N PROJECT NUMBER: P2126
PROGRAM ELEMENT TITLE: Tactical Data Links PROJECT TITLE: ATDLS Integration

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
PERFORMING ORGANIZATIONS (Continued:)										
Support and Management										
All Other Support and Management			17,453	17,453	9,947	946	1,266	1,304	Cont.	Cont.
Subtotal Support and Management			17,453	17,453	9,947	946	1,266	1,304	Cont.	Cont.
Test and Evaluation										
NAVAIRWARCENAIRDIV/ Patuxent River, MD	WX	Dec 95	20,390	20,390	3,140					
		Dec 96				1,700				
		Dec 97					2,700			
		Dec 98						5,827	Cont.	Cont.
NCCOSC R&D Div/ San Diego, CA	WX	Nov 95	5,321	5,321	344					
		Nov 96				1,126				
		Nov 97					6,162			
		Nov 98						3,653	525	5,321
All Other Test and Evaluation					0	0	0	0	0	0 0
Subtotal Test and Evaluation			25,711	25,711	3,484	2,826	8,862	9,480	Cont.	Cont.
Subtotal PERFORMING ORGANIZATIONS			251,302	251,302	91,708	27,257	38,779	45,384	Cont.	Cont.

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: September 1997

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0205604N PROJECT NUMBER: P2126
PROGRAM ELEMENT TITLE: Tactical Data Links PROJECT TITLE: ATDLS Integration

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
GOVERNMENT FURNISHED PROPERTY									
Product Development				0	0	0	0	0	0
Support and Management				0	0	0	0	0	0
Test and Evaluation									
MIDSCO INC, Fairfield NJ	SS/CPAF/IF	Jan 96	Jan 98	6,654					
		Nov 97				0	1,500	0	8,094
Subtotal Test and Evaluation				6,654	0	0	1,500	0	8,094
Subtotal GOVERNMENT FURNISHED PROPERTY				6,654	0	0	1,500	0	8,094
Subtotal Product Development				78,277	23,485	28,651	34,600	Cont.	Cont.
Subtotal Support and Management				9,947	946	1,266	1,304	Cont.	Cont.
Subtotal Test and Evaluation				3,484	2,826	8,862	9,480	Cont.	Cont.
Total Project				98,362	27,257	38,779	46,884	Cont.	Cont.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

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	657	2,044	3,053	3,870	2,339	2,256	CONT.	CONT.
V1916 Surface ASW System Improvements	6,412	7,334	7,489	12,835	15,351	17,069	13,468	CONT.	CONT.
TOTAL	6,412	7,991	9,533	15,888	19,221	19,408	15,724	CONT.	CONT.

(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.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

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	657	2,044	3,053	3,870	2,339	2,256	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.

- (U) ($357) 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) ($714) Complete MFTA system design specification development.

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1997	FY 1998	FY 1999
(U) FY 1998 President's Budget:	0	657	979
(U) Appropriated Value:	0		
(U) Adjustments to FY 1997 Appropriated Value/FY 1998 President's Budget:			
a. SQQ-89 / USW 21 Realignment			+1,018
b. NWCF adjustments			+47
(U) FY 1999 OSD/OMB Budget Submit:	0	657	2,044

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

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 1999 increase due to increase for MFTA development (+1,018), and Navy Working Capital Fund (NWCF) adjustments (+47).

(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 P-1 Line Item 44 (CLI 213600, 213605)	19,474	16,628	28,095	31,226	30,765	34,121	44,239	CONT.	CONT.

(U) RELATED RDT&E:

(U) PE 0603553N (Surface Anti-Submarine Warfare) - Advanced ASW Development

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

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:

	FY 1997	FY 1998	FY 1999
Program Milestones		1Q Begin MFTA Project	
Engineering Milestones			4Q Complete MFTA System Design Specification
T&E Milestones			
Contract Milestones			

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

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	7,334	7,489	12,835	15,351	17,069	13,468	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) a full 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. $432K used to forward fund FY 1998 tasks due to low expenditure in FY 1996.

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) ($2,809) 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-IIIA, 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.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

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) ($1,290) 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 Multi-Sensor Torpedo Recognition Alertment Processor (MSTRAP).
- (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-IIIAO 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.

- (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:

	FY 1997	FY 1998	FY 1999
(U) FY 1998 President's Budget:	6,503	7,334	6,211
(U) Appropriated Value:	6,901		
(U) Adjustments to FY 1997 Appropriated Value/FY 1998 President's Budget:			
a. SBIR transfer	-66		
b. Congressional undistributed reductions	-415		
c. Revised Economic Assumptions	-8		
d. SQQ-89 / USW 21 Realignment			+1,200
e. NWCF adjustments			+78
(U) FY 1999 OSD/OMB Budget Submit:	6,412	7,334	7,489

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

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 are for Small Business Innovative Research (SBIR) transfer (-66) and Congressional undistributed reductions (-423). FY 1999 increase is due to minor pricing adjustments (+1,278).

(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 P-1 Line Item 44 (CLI 213600, 213605)								
19,474	16,628	28,095	31,226	30,765	34,121	44,239	CONT.	CONT.

(U) RELATED RDT&E:
(U) PE 0603553N (Surface Anti-Submarine Warfare) - Advanced ASW Development
(U) PE 0604212N (Anti-Submarine Warfare & Other Helicopter Developments)

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

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:

	FY 1997	FY 1998	FY 1999
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			

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: September 1997

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	FY 1997	FY 1998	FY 1999
a. Primary H/W, S/W Development	4,447	4,949	5,297
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	7,334	7,489

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: September 1997

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 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development										
NUWC/NPT	WR	10/96	CONT.	CONT.	15,431	573	1,369	2,182	CONT.	CONT.
Misc	Var	Var	CONT.	CONT.	15,580	4,229	4,092	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.

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: September 1997

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 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									
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 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Subtotal Product Development	31,123	4,802	5,461	5,742	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	7,334	7,489	CONT.	CONT.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0205632N PROJECT NUMBER: V0366
PROGRAM ELEMENT TITLE: MK48 ADCAP PROJECT 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	11,627	10,786	17,802	18,705	16,942	24,844	29,912	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 FY03.

(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 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.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0205632N PROJECT NUMBER: V0366
PROGRAM ELEMENT TITLE: MK48 ADCAP PROJECT TITLE: MK48 ADCAP

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) ($4,389) 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.

- (U) ($1,134) Funding applied to meet rescission from CBASS program as a result of the FY97 Supplemental Appropriation Bill. The congressional language rescinded $1.9M of FY96 funds and $600K of FY97 funds. Actual FY96 expenditures precluded taking the full amount required from FY96 and thus the balance, $1,134K, was set aside from FY97 for reprogramming within NAVCOMPT.

2. (U) FY 1998 PLAN:

- (U) ($4,365) 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) ($1,312) 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.

- (U) ($1,496) 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) ($6,888) 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) ($1,669) 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) ($3,209) 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. Conduct land-based testing, and in-water system self-noise runs.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0205632N PROJECT NUMBER: V0366
PROGRAM ELEMENT TITLE: MK48 ADCAP PROJECT TITLE: MK48 ADCAP

- (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.

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1997	FY 1998	FY 1999
(U) FY 1998 President's Budget:	12,242	10,786	19,543
(U) Appropriated Value:	12,772		
(U) Adjustments to FY97 Appropriated Value:	0		
(U) Adjustments to FY98 President's Budget:	-1,145		-1,741
(U) FY 1999 OSD/OMB Budget Submit:	11,627	10,786	17,802

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding:
FY97: Reduced by $530K for Congressional Undistributed Reductions. Reduced by $15K for Revised Economic Assumptions and $600K for FY97 Supplemental Appropriations Bill.
FY99: Reduced by $223K for DBOF Surcharge Correction. Increased by $482K for NWCF R&D - Undersea Warfare Centers adjustment. Reduced $2,000K due to FY1999 funding constraints, and decision to slow software block upgrade IV development.

(U) Schedule: The realignment of $2,000K from FY99 to FY00 shifted the Block Upgrade IV Operational Evaluation (OPEVAL) from 4QFY99 to 1QFY00 and Block Upgrade IV IOC to later FY00.

(U) Technical: Not applicable

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

	FY 1997 ACTUAL	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	TO COMPLETE CONT.	TOTAL PROGRAM CONT.
WPN/322500	52,612	55,392	53,994	53,384	51,752	63,289	71,191	CONT.	CONT.

(U) RELATED RDT&E: Not Applicable

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0205632N PROJECT NUMBER: V0366
PROGRAM ELEMENT TITLE: MK48 ADCAP PROJECT TITLE: MK48 ADCAP

D. (U) SCHEDULE PROFILE:

	FY 1997	FY 1998	FY 1999	To Complete
Program Milestones		2Q G&C BLK III IOC 1Q CBASS MS II		FY00 G&C BLK IV IOC
Engineering Milestones				
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
Contract Milestones		3Q CBASS EM&D CONTRACT		

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: September 1997

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0205632N PROJECT NUMBER: V0366
PROGRAM ELEMENT TITLE: MK48 ADCAP PROJECT TITLE: MK48 ADCAP

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

	Project Cost Categories	FY 1997	FY 1998	FY 1999
a.	Hardware Development	793	3,458	5,881
b.	Software Development	2,282	2,494	3,904
c.	Systems Engineering	2,025	1,794	2,914
d.	Development Test & Evaluation	3,541	1,561	3,271
e.	Modeling & Simulation	1,658	1,289	1,652
f.	Program Management	194	190	180
g.	CBASS Recission	1,134*		
	Total	11,627	10,786	17,802

* This amount does not include a control reduction of $600K to pay part of this recission earlier in FY97.

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: September 1997

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0205632N PROJECT NUMBER: V0366
PROGRAM ELEMENT TITLE: MK48 ADCAP PROJECT TITLE: MK48 ADCAP

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

PERFORMING ORGANIZATIONS

Performing Activity	Contractor/ Government Fund Type	Contract Method/ 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 CLEVELAND OH		C,FPI	SEP 93	16,904	16,904	16,904	0	0	0	0	16,904
NGC/TBD CLEVELAND OH		C,FFP	JUN 95	CONT.	CONT.	1,650	0	1,235	2,432	CONT.	CONT.
NUWC NEWPORT RI/KEYPORT WA		WR	OCT 97	CONT.	CONT.	CONT.	7,255	6,752	10,977	CONT.	CONT.
ARL/PSU STATE COLLEGE PA		C,CPFF	FEB 98	CONT.	CONT.	CONT.	630	1,048	942	CONT.	CONT.
Support and Management											
VARIOUS		VAR	VAR	CONT.	CONT.	CONT.	194	190	180	CONT.	CONT.
Test and Evaluation											
COMOPTEVFOR NORFOLK VA		WR	DEC 97	CONT.	CONT.	CONT.	0	93	95	CONT.	CONT.
NUWC NEWPORT RI/KEYPORT WA		WR	OCT 97	CONT.	CONT.	CONT.	3,548	1,468	3,176	CONT.	CONT.

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

PROJECT COST BREAKDOWN: ($ in thousands)

	Total FY 1996 & Prior	FY 1997 Actual	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Subtotal Product Development	CONT.	7,885	9,035	14,351	CONT.	CONT.
Subtotal Support and Management	CONT.	194	190	180	CONT.	CONT.

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: September 1997

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0205632N PROJECT NUMBER: V0366
PROGRAM ELEMENT TITLE: MK48 ADCAP PROJECT TITLE: MK48 ADCAP

Subtotal Test and Evaluation	CONT.	3,548	1,561	3,271	CONT.	CONT.
Total Project	CONT.	11,627	10,786	17,802	CONT.	CONT.

DATE: September 1997

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
W0601 Common Ground Equipment	3,459	2,988	6,421	4,242	4,018	3,591	3,681	CONT.	CONT.
W0852 Consolidated Automated Support System (CASS)	7,028	8,951	9,029	8,969	9,170	9,348	9,587	CONT.	CONT.
W1041 Aircraft Equipment Reliability & Maintainability Improvement Program (AERMIP)	1,084	1,479	1,373	939	807	705	712	CONT.	CONT.
W1355 Aircraft Engine Component Improvement Program (CIP)	39,223	46,607	49,117	53,394	45,550	47,386	54,071	CONT.	CONT.
TOTAL	50,794	60,025	65,940	67,544	59,545	61,030	68,051	CONT.	CONT.

(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.

DATE: September 1997

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	TOTOAL PROGRAM
W0601 Common Ground Equipment	3,459	2,988	6,421	4,242	4,018	3,591	3,681	CONT	CONT

RDT&E Articles (Advanced Boresight Equipment) 4

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) FY 1997 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.
- (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) ($850) Continue USN involvement with USAF Next Generation Munitions Handler.
- (U) ($150) Initiate development of Universal Aircraft Axle Jack.
- (U) ($165) Initiate development of an Automated Engine Turning Tool.
- (U) ($130) Initiate development of Armament Handling Equipment (AHE) Proofload Testing.
- (U) ($90) Initiate Night Vision Goggle and Support Equipment (SE) Compatability.
- (U) ($130) Initiate development of Fuel Purging System.
- (U) ($150) Initiate development of Advanced Shipboard Tow Tractor.
- (U) ($218) Initiate development of Alternate Power Plants/Fuels for Tow Tractor.
- (U) ($65) Initiate and complete development of Common Missile Gel Pad.

3. (U) FY 1999 PLAN:

- (U) ($3020) Continue Advanced Boresight Equipment development program.
- (U) ($1056) Continue development of USAF Next Generation Munitions Handler.
- (U) ($375) Continue development of Universal Aircraft Axle Jack.
- (U) ($125) Continue developing Automated Engine Turning Tool.
- (U) ($155) Continue developing AHE Proofload Testing.
- (U) ($66) Initiate development and testing of General Purpose O-Level Wire Tester.
- (U) ($115) Continue developing Night Vision Goggle and SE Compatability.
- (U) ($58) Complete developing Fuel Purging System.
- (U) ($155) Continue developing Advanced Shipboard Tow Tractor.
- (U) ($140) Continue developing Alternate Power Plants/Fuels for Tow Tractor.
- (U) ($240) Initiate development of a state-of-the-art Fuel System for Standard Engine Test Systems.
- (U) ($140) Initiate development of One Man Pintle Hook.
- (U) ($236) Initiate development of Rough Terrain Tow Vehicle for USMC Rapid Deployment.
- (U) ($185) Initiate development of Electric Spotting Dolly.
- (U) ($125) Initiate development of Aircraft Engine Test Facility Primary Air Inlet.

- (U) ($115) Initiate development of Fuel Depuddling System.
- (U) ($115) Initiate development of Fuel Recycling System.

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1997	FY 1998	FY 1999
(U) FY 1998 President's Budget:	2,089	2,988	7,370
(U) Appropriated Value:	3,689		
(U) Adjustments from PRESBUDG:	-44	0	-949
(U) FY 1999 OSD/OMB Budget Submit:	3,459	2,988	6,421

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1997 reflects a decrease of $40 thousand for SBIR transfer, $4 thousand decrease for revised economic adjustments. FY1999 reflects decreases of $10 thousand for Resource Sponsor Program Adjustment, a decrease of $1 million for Restoral of CSA, and a $61 thousand increase for Navy Working Capital Fund.

(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
(U) APN-7 (47C2)									
	127,349	113,944	150,759	164,126	140,082	141,542	145,069	CONT	CONT
(U) O&MN									
	3,474	5,056	4,807	4,824	4,855	4,958	5,066	CONT	CONT

(U) RELATED RDT&E: Not applicable.

D. (U) SCHEDULE PROFILE: Not applicable.

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

Project Cost Categories	FY 1997	FY 1998	FY 1999
a. Software Development	200	0	0
b. Developmental Test & Eval	300	200	300
c. Development SE Acquisition	2,959	2,788	6,121
TOTAL	3,459	2,988	6,421

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										
AAI Corp Cockeysville, MD										
	FP	5/19/94	6,729	6,729	2,760	0	0	3,020	CONT	CONT
Misc (Gov.)	WR				9,703	3,159	2,788	3,101	CONT	CONT
Support and Management - Not applicable										
Test and Evaluation										
Miscellaneous		10/98	10/98	0	739	300	200	300	CONT	CONT

GOVERNMENT FURNISHED PROPERTY - Not applicable

Subtotal Product Development	12,463	3,159	2,788	6,121	CONT	CONT
Subtotal Support and Management	0	0	0	0	0	0
Subtotal Test and Evaluation	739	300	200	300	CONT	CONT
Total Project	13,202	3,459	2,988	6,421	CONT	CONT

(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
W0852 Consolidated Automated Support System									

	7,028	8,951	9,029	8,969	9,170	9,348	9,587	CONT	CONT
Current Program Value	7,029								

RDT&E Articles

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/electronics 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 Systems (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.
- (U) ($1,000) Completed development of RF switching, and load capability, and commence and complete development of millimeter wave generation source.
- (U) ($1) This submission does not reflect 1K reserved for economic rescission.

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 Emulater Test (CBET).
- (U) ($2,450) 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.

4. (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) ($2,414) 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.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0205633N PROJECT NUMBER: W0852
PROGRAM ELEMENT TITLE: Aviation Improvements PROJECT TITLE: Consolidated Automated Supp Sys

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1997	FY 1998	FY 1999
(U) FY 1998 President's Budget:	7,220	8,951	8,969
(U) Appropriated Value:	7,599		
(U) Adjustments from PRESBUDG:	-192	0	+60
(U) FY 1999 OSD/OMB Budget Submit:	7,028	8,951	9,029

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1997 decrease reflects $183 thousand for SBIR transfer, and a $9 thousand decrease for revised economic adjustments. FY 1999 reflects a decrease of $12 thousand for Resource Sponsor Adjustments and an increase of $72 thousand for Navy Working Capital Fund.

(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) APN-7 (47C2)								
106,754	107,162	110,774	108,874	117,684	120,209	123,504	CONT	CONT
(U) O&MN								
1,100	900	300	0	0	0	0	0	9,000

(U) RELATED RDT&E: PE 0207163F (AMRAAM Air Force)
PE 0207163N (AMRAAM)
PE 0604746A (Automated Test Equipment Development)

(U) A Memorandum of Agreement was executed between Naval Air Systems Command (NAVAIR) and the Air Force Systems Command (October 1988) in which the Navy will provide complete depot level repair for AMRAAM on CASS. A Memorandum of Understanding has also been executed between the U.S. Army and NAVAIR (March 1991) for technical support and procurement of the CASS Electro-optical subsystem for integration with the Army's Integrated Family of Test Equipment (IFTE) program.

D. (U) SCHEDULE PROFILE:

	FY 1997	FY 1998	FY 1999	TO COMPLETE
Program Milestones		III 7/98 EO+		
Engineering Milestones				
T& E O+ DT&E Milestones		EO+ FOT&E OT-IIIB 1/98		
Contract Milestones				

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

Project Cost Categories	FY 1997	FY 1998	FY 1999
a. Development SE Acquisition	0	0	0
b. Ancillary H/W Development	1,700	2,250	2,291
c. S/W Development	3,364	4,663	4,307
d. Systems Engineering	1,964	2,038	2,431
TOTAL	7,028	8,951	9,029

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										
Hughes/USAF										
Tucson, AZ	FPI	9/3/95	43,627	43,627	43,627	0	0	0	0	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	0	0	0	0	2,621
NAWC, Lakehurst, NJ			25,000	25,000	6,998	4,527	4,402	4,172	CONT	CONT
Support and Management										
Misc (Gov)	WX/MIPR		8,472	8,472	2,210	418	1,012	1,034	CONT	CONT

Test and Evaluation Not applicable.

GOVERNMENT FURNISHED PROPERTY - Not applicable

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

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205633N
PROGRAM ELEMENT TITLE:Aviation Improvement

PROJECT NUMBER: W0852
PROJECT TITLE:Consolidated Automated Supp Sys

Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program

Subtotal Production Development	59,860	6,610	7,939	7,995	CONT	CONT
Subtotal Support and Management	2,210	418	1,012	1,034	CONT	CONT
Subtotal Test and Evaluation	0	0	0	0	0	0
Total Project	61,970	7,028	8,951	9,029	CONT	CONT

DATE: September 1997

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	1,479	1,373	939	807	705	712	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 equipments installed in Naval aircraft. It provides 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) ($1479) Complete AHRS and SKYFLEX. Continue SKYFLEX, 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).

3. (U) FY 1999 PLAN:

- (U) ($1373) 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:

	FY 1997	FY 1998	FY 1999
(U) FY 1998 President's Budget:	1,085	1,479	1,395
(U) Appropriated Value:	1,136		
(U) Adjustments from PRESBUDG:	-1		-22
(U) FY 1999 OSD/OMB Budget Submit:	1,084	1,479	1,373

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1997 reflects a decrease of $1 thousand for revised economic adjustments. FY 1999 reflects a decrease of $2 thousand for Resource Sponsor program adjustments and an increase $20 thousand for the Navy Working Capital Fund.

(U) Schedule: Not Applicable.

(U) Technical: Not Applicable.

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

D. (U) SCHEDULE PROFILE: Not Applicable

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	46,607	49,117	53,394	45,550	47,386	54,071	CONT.	CONT.
Current Program Value	39,226								

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.

DATE: September 1997

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-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.
  - This Submission does not reflect $3K reserved for economic rescission.

DATE: September 1997

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

2. (U) FY 1998 PLAN:

- (U)($40,655) 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, begin bearing and oil system improvements, 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, test turbine compressor efficiency
  - S-3 continue efforts to reduce the number of bare firewalls, complete mission analysis, resolve single engine rate of climb issues, develop and implement 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, conduct altitude test
  - F-14A address the top two reasons for unscheduled engine removals, sustaining engineering efforts and new problem resolution, maintenance issues awareness
  - 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; and perform an accelerated simulated mission engine test (ASMET) on the engine.
  - 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, conduct ASMET test, 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.
  - 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.

- (U) ($5,952) Multi-Platform Product Support. Complete 10 projects, continue 46 projects, and initiate 15 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.

4. (U) FY 1999 PLAN:
   - (U) ($43,330) 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, reducing 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.
     - T-45 continue to address platform safety, specification compliance, mission profile updates, and life cycle management.

DATE: September 1997

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

- 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 continue to build CIP programs with major efforts addressing necessary durability improvements identified during qualification testing and increasing the scope of the life cycle management program.

- (U) ($5,787) Multi-Platform Product Support Teams. Complete 12 projects, continue 28 projects, initiate 9 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:

	FY 1997	FY 1998	FY 1999
(U) FY 1998 President's Budget:	40,934	46,607	51,783
(U) Appropriated Value:	42,688		
(U) Adjustments from PRESBUD:	-1,711		-2,666
(U) FY 1999 OSD/OMB Budget Submit:	39,223	46,607	49,117

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1997 decrease reflects $163 thousand for the SBIR assessment, $50 thousand decrease for revised economic assumptions, $1498 decrease for Resource Sponsor Program Adjustmets. FY 1999 change reflects $113 thousand decrease for Navy Working Capital Fund (NWCF) surcharge, $68 thousand decrease for balancing adjustments, $3000 thousand decrease for higher Navy priorities, and $515K increase for NAWC and NADEP adjustments.

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

DATE: September 1997

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

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.

DATE: September 1997

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

BUDGET ACTIVITY:

PROGRAM ELEMENT: 0205633N
PROGRAM ELEMENT TITLE: AVIATION IMPROVEMENTS

PROJECT NUMBER: W1355
PROJECT TITLE: AIRCRAFT ENGINE CIP

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

Project Cost Categories	FY 1997	FY 1998	FY 1999
a. Product Development	34,544	40,281	42,361
b. Support and Management	620	1,045	1,150
c. Test and Evaluation	4,059	5,281	5,606
Total	39,223	46,607	49,117

DATE: September 1997

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	2,200	2,120	CONT.	CONT.
(EVENDALE, OHIO)										
F402 ENGINE PROGRAM										
N0001996C0172 RR	CPAF	10/97	CONT.	CONT.	1,733	1,815	1,860	1,910	CONT.	CONT.
N0001996C0134 UK	CPFF	10/97	CONT.	CONT.	2,766	1,565	1,870	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	6,600	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	2,800	2,744	CONT.	CONT.
(WEST PALM BEACH, FLORIDA)										
T56 ENGINE PROGRAM										
F4160893C856 ALLISON										
(INDIANAPOLIS, INDIANA)		4/93	CONT.	CONT.	8,221	1,504	1,800	1,850	CONT.	CONT.

DATE: September 1997

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 (BRISTOL, ENGLAND)		10/97	CONT.	CONT.	2,038	901	1,150	1,260	CONT.	CONT.
F414 ENGINE PROGRAM										
NAVAIR CONTRACT GE CPFF (LYNN, MASSACHUSETTS)		TBD	TBD	TBD	0	0	1,000	4,150	CONT.	CONT.
T700 ENGINE PROGRAM										
DAAJ0995C0101 GE CPFF (LYNN, MASSACHUSETTS)		10/97	CONT.	CONT	2,764	1,315	1,288	1,325	CONT.	CONT.
TF34 ENGINE PROGRAM										
F1460895C1461 GE CPFF (LYNN, MASSACHUSETTS)		10/97	CONT.	CONT	1,375	505	1,200	1,150	CONT.	CONT.
T406 ENGINE PROGRAM										
NAVAIR CONTRACT ALLISON CPFF (INDIANAPOLIS, INDIANA)		TBD	TBD	TBD	0	0	500	2,165	CONT.	CONT.
All other contracts under $1.0M (Aggregrate Total):					5,825	1,304	1,487	1,005	CONT.	CONT.
Subtotal Contracts:					69,734	19,164	23,755	28,169	CONT.	CONT.

DATE: September 1997

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 Description	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										
Lab/Field Activity ($1.0M or more)										
NAWC PAX CIP SPT. WX		10/97	CONT.	CONT.	34,077	13,949	14,356	12,691	CONT.	CONT.
All other in-house support under $1.0M (Aggregate Total):										
VARIOUS	VARIOUS	10/97	CONT.	CONT.	6,896	1,103	1,670	1,039	CONT.	CONT.
Subtotal Lab\Activity\Other:					40,973	15,052	16,026	13,730	CONT.	CONT.
GOVERNMENT FURNISHED PROPERTY										
Product Development										
All other GFP: (FUEL) MD INCREMENTAL					2,207	328	500	462	CONT.	CONT.
Total Product Development					112,914	34,544	40,281	42,361		
Test and Evaluation:										
F404/T58/T64 ENGINE PROGRAM										
N0001995C0129 GE CPFF (LYNN, MASSACHUSETTS)		10/97	CONT.	CONT.	3,000	3,000	3,000	2,300	CONT.	CONT.
All other contracts under $1.0M (Aggregrate Total):					950	345	1,505	2,536	CONT.	CONT.
Subtotal Contracts:					3,950	3,345	4,505	4,836	CONT.	CONT.

DATE: September 1997

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

					FY 1996 & Prior	FY 1997 Actual	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
All other in-house test and evaluation under $1.0M (Aggregate Total):										
VARIOUS	VARIOUS	10/97	CONT.	CONT.	744	714	776	770	CONT.	CONT.
Subtotal Lab\Activity\Other:					744	714	776	770	CONT.	CONT.
Total Test and Evaluation					4,694	4,059	5,281	5,606		
Support and Management				CONT.	332	620	1,045	1,150	CONT.	CONT.

	FY 1996 & Prior	FY 1997 Actual	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Subtotal Product Development	112,914	34,544	40,281	42,361	CONT.	CONT.
Subtotal Test & Evaluation	4,694	4,059	5,281	5,606	CONT.	CONT.
Subtotal Support and Management	332	620	1,045	1,150	CONT.	CONT.
Total Project	117,940	39,223	46,607	49,117	CONT.	CONT.

C. (U) Not required.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

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	11,704	13,060	1,284	1,256	1,248	1,251	0	1,834,707

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.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

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) ($11,704) Continue development and test of third PDU tape.

3. (U) FY 1999 PLAN:

- (U) ($13,060) Continue development and test of third PDU tape.

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1997	FY 1998	FY 1999
(U) FY 1998 President's Budget:	9,437	11,704	14,839
(U) Appropriated Value:	9,879		
(U) Adjustments from PRESBUDG:	-60	0	-1,779
(U) FY 1999 OSD/OMB Budget Submit:	9,377	11,704	13,060

(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 net adjustment of -$1,779 thousand in FY 1999 is comprised of -$2,000 thousand for restoral of Common Support Aircraft, -$191 thousand for Navy Working Capital Fund (NWCF) surcharge, +$431 thousand for Air Warfare Center adjustment, and -$19 thousand for resource sponsor balancing.

(U) Schedule: (U) Funding reduction in FY 1999 has resulted in a slip in Tape D03B to FY 2000.

(U) Technical: N/A

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

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)

	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
APN-5 F-14 (B.A. 5) Line 20	226,468	290,500	229,498	85,503	8,492	26,549	20,558	14,562	2,425,230

(U) RELATED RDT&E:
(U) PE 0205604N (Tactical Data Links)
(U) PE 0604270N (EW Development)

D. (U) SCHEDULE PROFILE:

	FY 1997	FY 1998	FY 1999	TO COMPLETE
Program Milestones				
Engineering Milestones				
T&E Milestones	3Q/97 - 1Q/98 OT-III(Tape 3A)			1Q/00 - 2Q/00 OT-III(Tape 3B)
Contract Milestones				

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: September 1997

BUDGET ACTIVITY: 07
PROGRAM ELEMENT: 0205667N
PROGRAM ELEMENT TITLE: F-14 Upgrade
PROJECT NUMBER: E1408
PROJECT TITLE: F-14 Upgrade

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

Project Cost Categories	FY 1997	FY 1998	FY 1999
a. PDU Software Development	9,077	11,404	12,760
b. PDU Systems Engineering/Test and Evaluation	300	300	300
c. Digital Flight Control System Flight Tests	0	0	0
Total	9,377	11,704	13,060

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: September 1997

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	221,165	221,165	190,433	7,368	11,004	12,360	0	221,165
Miscellaneous			26,844	26,844	24,948	805	547	544	0	26,844
AVDLR			5,039	5,039	0	0	0	0	5,039	5,039
Support and Management:										
various	WX	10/98	1,505	1,505	1,046	150	153	156	0	1,505
Test and Evaluation:										
COMOPTEVFOR PD		6/95	3,760	3,760	3,760	0	0	0	0	3,760

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: September 1997

BUDGET ACTIVITY: 07
PROGRAM ELEMENT: 0205667N
PROGRAM ELEMENT TITLE: F-14 Upgrade
PROJECT NUMBER: E1408
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	11,551	12,904	5,039	1,278,088
Subtotal Support and Management	1,046	150	153	156	0	1,505
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	11,704	13,060	5,039	1,834,707

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

DATE **September 1997**

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	53850	35641	51475	52418	36551	27658	25453	Continuing	Continuing
C2270 Command Post Systems	11165	7430	9948	10648	5858	5207	3371	Continuing	Continuing
C2271 Maneuver C2 Systems	5278	1469	2127	1873	453	0	0	0	11200
C2272 Intelligence C2 Systems	3516	3251	3569	4036	4153	4275	4410	Continuing	Continuing
C2273 Air Operations C2 Systems	7407	5328	6479	6412	2741	1366	1414	Continuing	Continuing
C2274 C2 Warfare Systems	3878	3390	4068	3936	3381	3937	4688	Continuing	Continuing
C2275 Radio Systems	364	3107	3002	5203	2399	746	746	Continuing	Continuing
C2276 Communications Switching and Control System	3333	2084	2143	1784	1880	0	0	0	11224
C2277 Systems Engineering and Integration	14859	243	6615	5839	3010	3015	3015	Continuing	Continuing
C2278 Air Defense Weapons Systems	809	817	2041	865	890	917	944	Continuing	Continuing
C2315 Training Devices/Simulators	3241	8522	10108	10399	10313	6670	5283	Continuing	Continuing
C2317 ASCIET	0	0	1375	1423	1473	1525	1582	Continuing	Continuing
Quantity of RDT&E Articles									

(U) Mission Description and Budget Item Justification: 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: 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

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE September 1997
BUDGET ACTIVITY **7 - Operational System Development**	PE NUMBER AND TITLE **0206313M Marine Corps Communications Systems**

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.

(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.

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

DATE **September 1997**

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206313M Marine Corps Communications Systems

PROJECT
C2270

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
C2270 Command Post Systems	11165	7430	9948	10648	5858	5207	3371	Continuing	Continuing
Quantity of RDT&E Articles									

A. (U) <u>Mission Description and Budget Item Justification:</u> 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&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.

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

DATE **September 1997**

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206313M Marine Corps Communications Systems

PROJECT
C2270

PROGRAM ACCOMPLISHMENTS AND PLANS:

(U) FY 1997 Accomplishments:

- (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) $ 75 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) $ 1000 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) $ 72 IDASC: Updated and completed data packages/training manuals, developmental testing, and software documentation.
- (U) $ 340 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 managment support, and related travel costs.
- (U) $ 490 ATACC: Conduct study for the development of the Contigency Theater Automated Planning Systems (CTAPS) and the Theater Battle Management Core System(TBMCS) which is the follow on to CTAPS.
- (U) $ 800 ATACC: Initiated study for the development of Meshnet Marine Air C2 Common Voice Communication Subsystem.
- (U) $ 977 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.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE September 1997
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0206313M Marine Corps Communications Systems	PROJECT C2270

- (U) $ 1351 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.
- (U) $ 240 AFATDS: Initiated developmental effort to identify a smaller computer for the Marine Corps.
- (U) $ 1229 Forward finance efforts in this project and program elements for the IAS, IDASC, TCO and AFATDS programs.

(U)Total $ 11,165

(U) FY 1998 Planned Program:

- (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) $ 600 TCO: Initiate the incorporation of Phase IV ORD requirements.
- (U) $ 70 TCO: Complete automatic relay message routing.
- (U) $ 200 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) $ 300 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) $ 373 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) $ 1085 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) $ 651 MAGTF C4I Baseline: Continue software integration to the MSBL.
- (U) $ 434 MAGTF C4I Baseline: Continue developmental and battle lab testing of MSBL.
- (U) $ 369 EICOC: Begin investigating GOTS/COTS software/hardware to support automation of Command Post Systems.
- (U) $ 552 EICOC: Integration efforts of GOTS/COTS software/hardware into the Command Post System.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE September 1997
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0206313M Marine Corps Communications Systems	PROJECT C2270

- (U) $ 305 EICOC: Begin developmental testing of Command Post System.
- (U) $ 1588 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.
- (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.

(U)Total $ 7,430

(U) FY 1999 Planned Program:

- (U) $ 780 TCO: Initiate investigation of hardware ECP for TCO systems.
- (U) $ 413 TCO: Complete Phase IV ORD requirements.
- (U) $ 230 TCO: Integrate software and hardware changes into existing systems and perform testing.
- (U) $ 278 IAS: Continue testing new standard software applications into existing system.
- (U) $ 475 IAS: Continue interoperability testing with system hardware and software modifications. Investigate and develop computer based training. Achieve MS III.
- (U) $ 408 IDASC: Investigate hardware ECPs for the HMD DASC system for migration towards a common USMC Aviation Comand and Control Communications System.
- (U) $ 242 IDASC: Continue testing new standard software applications. Continue interoperability testing with system modifications.
- (U) $ 250 IAS MOD: Continue investigation of hardware ECPs for MEF IAS and IAS Suites.
- (U) $ 175 IAS MOD: Continue program management for testing of ECPs.
- (U) $ 946 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.
- (U) $ 568 MAGTF C4I BASELINE: Continue software integration to the MSBL.
- (U) $ 380 MAGTF C4I BASELINE: Continue developmental and battle lab testing of the MSBL.
- (U) $ 850 MAGTF C4I BASELINE: Initiate the integration (system level) of Enhanced Position Location Reporting System (EPLRS) with MAGTF C4I tactical data systems.
- (U) $ 250 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
- (U) $ 375 EICOC: Continue investigating GOTS/COTS software/hardware to support automation of Command Post Systems.
- (U) $ 562 EICOC: Continue integration efforts of GOTS/COTS software/hardware into the Command Post Systems.

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

DATE **September 1997**

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206313M Marine Corps Communications Systems

PROJECT
C2270

- (U) $ 313 EICOC: Continue developmental testing of Command Post System.
- (U) $ 2453 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 obtainng a Procurement Decision.

(U)Total $ 9,948

B. (U) Project Change Summary

	FY 1997	FY 1998	FY 1999
(U) Previous President's Budget	12194	5260	6954
(U) Adjustments to Previous President's Budget	-1029	2170	2994
(U) Current Budget Submit	11165	7430	9948

(U) Change Summary Explanation:

(U) Funding: FY97: Funding decrease due to realignment within the Marine Corps C4I programs and minor affordability adjustments.

FY98: Funding increase of $3069 is due to realignment of COCI funds to MSBL for software integration and a decrease of $899 due to realignment of civilian salaries to O&M,MC.

FY99: Funding increase of $2994K is due to realignment of funds to MSBL for software integration, $1611 from COCI, $1216 from MAGTF SE&I and $1100 from EPLRS, a decrease of $926 due to realignment of civilian salaries to O&M,MC, and a decrease of $8 for NWCF surcharge, a decrease of $2 for NWCF R&D for NCCOSC, and an increase of $3 for NWCF for R&D for Surface Warfare Center.

(U) Schedule: Not Applicable

(U) Technical: Not Applicable

C. (U) Other Program Funding Summary (APPN, BLI #, NOMEN)

	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	To Compl	Total Cost
(U) PMC BLI# 463100 TCO	6673	9629	1613	1088	913	669	666	CONT	CONT
(U) PMC BLI# 474700 IAS	6880	10289	10558	0	0	0	0	0	27727
(U) PMC BLI# 474700 IAS (TCAC)	10707	0	0	0	0	0	0	0	10707
(U) PMC BLI# 463600 IDASC	4084	1392	1432	1587	1637	1567	1619	CONT	CONT
(U) PMC BLI# 474900 IAS MOD	4615	1406	1390	1373	1336	1521	1572	CONT	CONT
(U) PMC BLI# 463100 AFATDS	0	0	3643	16799	16784	11016	0	0	48242
(U) TCO (O&MMC)	110	447	508	522	538	554	570	CONT	CONT

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

DATE **September 1997**

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206313M Marine Corps Communications Systems

PROJECT
C2270

C. (U) Other Program Funding Summary (APPN, BLI #, NOMEN)	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	To Compl	Total Cost
(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

(U) Related RDT&E

(U) PE 0301301L (Department of Defense Intelligence and Information Systems/Military Intelligence Integrated Data System/Integrated Data Base I and II) (Defense Intelligence Agency).

(U) Navy Tactical Flag Communication and Control System.

(U) PE 0206313M, Marine Corps Communications Systems Command/Control.

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

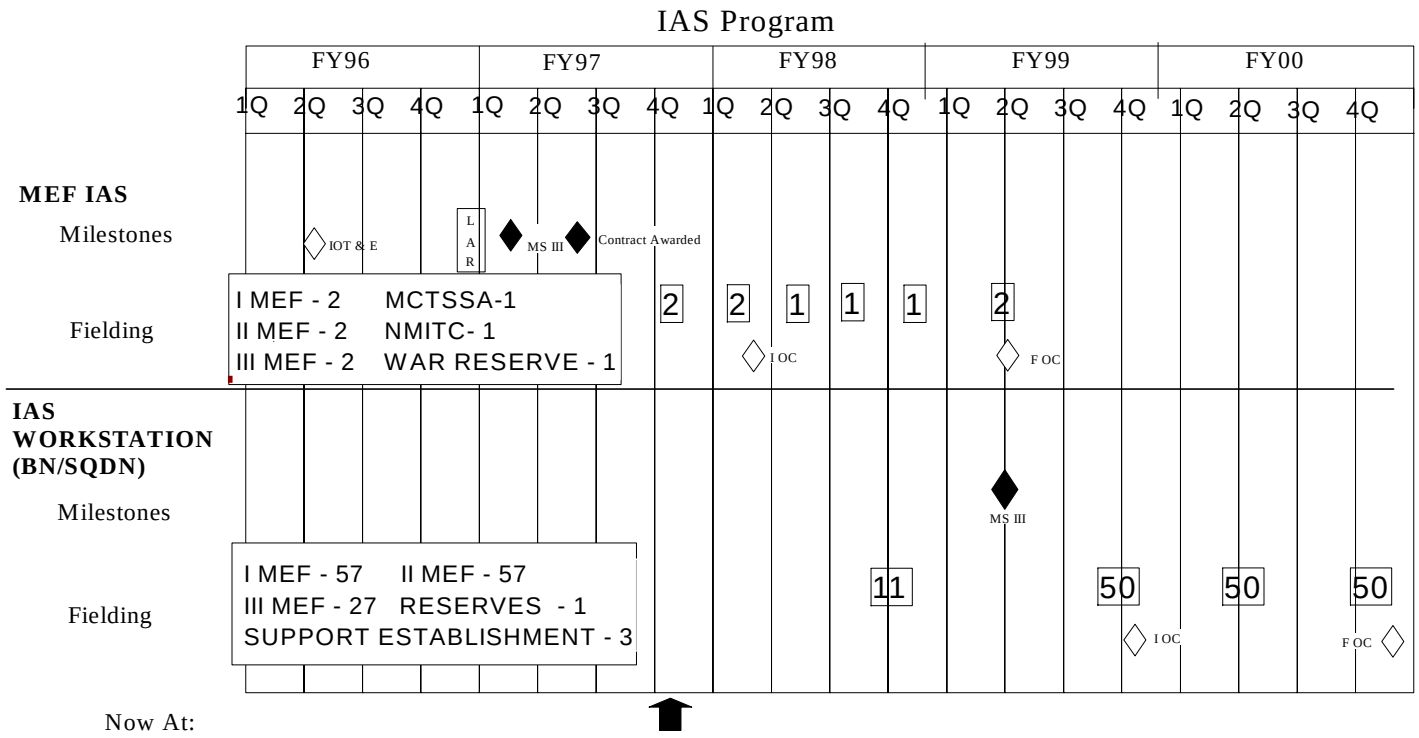
DATE **September 1997**

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206313M Marine Corps Communications Systems

PROJECT
C2270

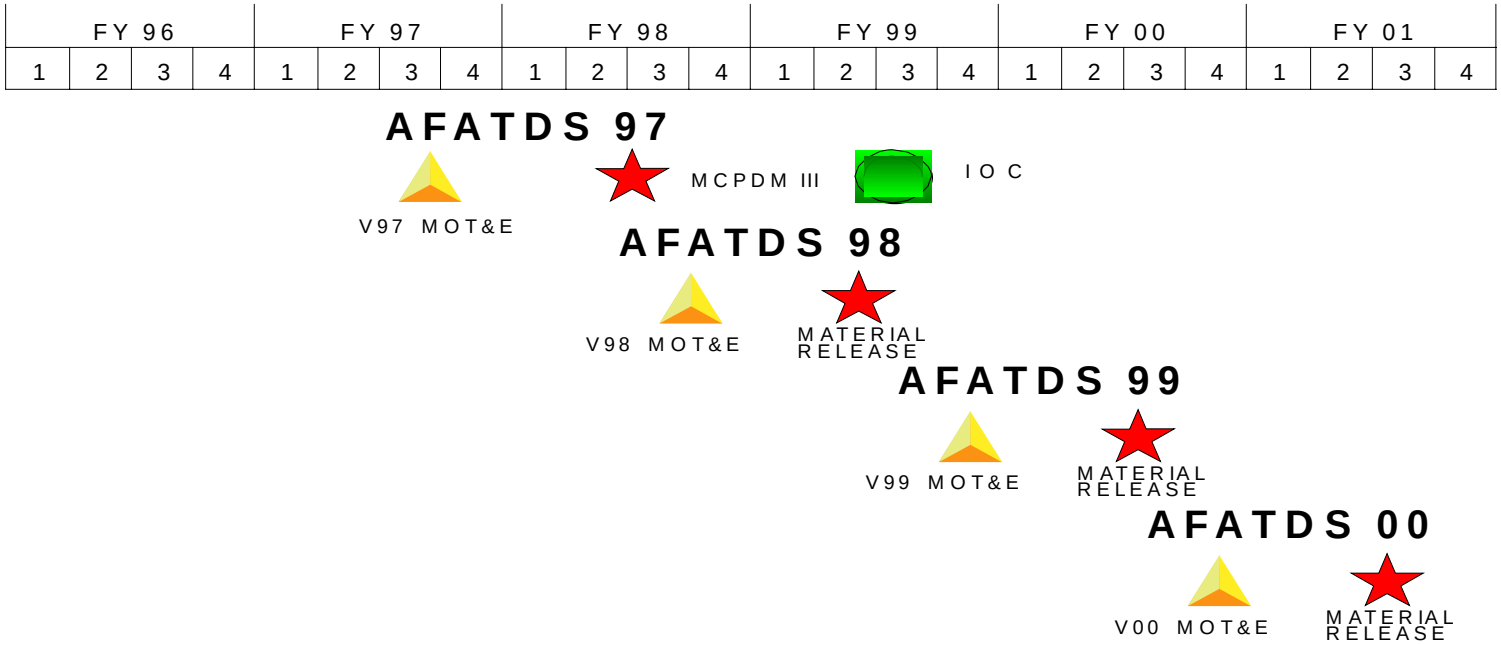
D. (U) Schedule Profile



RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE September 1997
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0206313M Marine Corps Communications Systems	PROJECT C2270

Advanced Field Artillery Tactical Data System

SCHEDULE



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

DATE **September 1997**

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206313M Marine Corps Communications Systems

PROJECT
C2270

A. (U) Project Cost Breakdown

	FY 1997	FY 1998	FY 1999
Primary Hardware Development	1010	573	985
Ancillary Hardware Development	75	72	230
Software Development	2052	3254	3926
Systems Engineering	3522	449	529
Training Development	0	0	30
Developmental Test and Evaluation	3521	1038	1021
Program Management Support	350	480	486
Software Integration	635	1544	2720
Software Licenses	0	20	21
Total	11165	7430	9948

B. Budget Acquisition History and Planning Information

Performing Organizations

Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1997	FY 1997	FY 1998	FY 1999	Budget to Complete	Total Program
Product Development Organizations										
TCO: MCTSSA, Camp Pendleton, CA	WR	Oct 96			0	270	567	870	CONT	CONT
Forward Finance	WR	Oct 97	400	400	0	400	0	0	0	400
NISE EAST Charleston, SC	WR	Oct 96			0	75	72	102	CONT	CONT
NISMC, Wash. D.C.	C/RCP	Oct 96	21	21	0	21	0	0	0	21

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

DATE **September 1997**

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206313M Marine Corps Communications Systems

PROJECT
C2270

IAS: NAWC, Pt. Mugu, CA	C/RCP	Feb 97	754	754	0	254	50	0	450	754
CECOM, Ft. Monmouth, NJ	C/MIPR	Nov 96	66	66	0	66	0	0	0	66
NSWC, Crane, IN	C/RCP	Nov 96			0	200	0	400	CONT	CONT
NAWC, Pt. Mugu, CA	C/RCP	Nov 96	250	250	0	250	0	0	0	250
IAS MOD: NSWC, Crane, IN	C/RCP	Dec 97			0	0	373	250	CONT	CONT
IDASC: NSWC, Crane, IN	WR	Oct 96			0	100	248	284	CONT	CONT
MCTSSA, Camp Pendleton, CA	WR	Oct 96				126	229	242	CONT	CONT
Forward Finance	WR	Oct 97	100	100	0	100	0	0	0	100
ATACC: Warner Robbins AFB, GA	C/RCP	May 97	1535	1535	0	1535	0	0	0	1535
SALC, McClellan AFB, CA	C/RCP	May 97	430	430	0	430	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	400	0	0	0	400
MAGTF C4I Baseline: MCTSSA, Camp Pendleton, CA	WR	Nov 98			0	0	1492	1487	CONT	CONT
SPAWAR, CrystalCity,VA/ San Diego, CA	C/PFF/RCP	Mar 97			0	499	0	0	CONT	CONT
CECOM, Fort Monmouth, NJ.	WR	Oct 98			0	0	0	200	CONT	CONT
NRAD, San Diego	WR	Oct 98			0	0	0	350	CONT	CONT

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

DATE **September 1997**

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206313M Marine Corps Communications Systems

PROJECT
C2270

NISE EAST, St. Inigoes, MD	WR	Oct 98	2662	2662	0	0	420	426	1816	2662
AFATDS: USA, Ft. Sill, OK	CPFF/MIPR	Jan 97			0	2355	1488	2293	CONT	CONT
Forward Finance	CPFF/MIPR	Oct 97	612	612	0	612	0	0	0	612
MCSC, Quantico, VA	CPFF/RCP	Jun 97			0	240	100	160	CONT	CONT
Support and Management Organizations										
TCO: MCTSSA, Camp Pendleton, CA	WR	Oct 96			0	119	97	136	CONT	CONT
NAWC, Pt. Mugu, CA	CPFF/RCP	Apr 97			0	100	0	100	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
IAS: 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
IDASC: MCSC, Quantico, VA	WR	Oct 96			0	82	112	124	CONT	CONT
MAGTF C4I Baseline: Vanguard, Dumfries, VA	C/PFF/RCP	Jun 97	45	45.	0	45	0	0	0.	45
SPAWAR, Crystal City, VA	C/PFF/RCP	Mar 97	435	435	0	435	0	0	0.	435
TBN	C/PFF/RCP	Nov 98			0	0	0	259	CONT	CONT

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

DATE **September 1997**

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206313M Marine Corps Communications Systems

PROJECT
C2270

EICOC: MCSC, Quantico, VA	CPFF/RCP	TBD			0	0	180	186	CONT	CONT
ATACC: MCTSSA, Camp Pendleton, CA	WR	Oct 96	153	153	0	153	0	0	0	153
MCSC, Quantico, VA	WR	Oct 96	145	145	0	145	0	0	0	145
MCSC, Quantico, VA	RCP	May 97	270	270	0	270	0	0	0	270
Test and Evaluation Organizations										
TCO: MCTSSA, Camp Pendleton, CA	WR	Oct 96			0	84	80	90	CONT	CONT
IAS: ARL, Adelphi, MD	C/MIPR	Jul 97			0	932	50	75	CONT	CONT
Forward Finance		Oct 97	117	117	0	117	0	0	0	117
MCTSSA, Camp Pendleton, CA	C/RCP/WR	Sep 96			0	61	230	238	CONT	CONT
JITC, Ft. Huachuca, AZ	C/MIPR	Sep 97			0	37	0	40	CONT	CONT
ESC, Hanscom, MA	C/MIPR	Sep 97	40	40	0	40	0	0	0	40
IAS MOD: ARL, Adelphi, MD	C/MIPR	TBD	350	350	0	0	100	75	175	350
MAGTF C4I Baseline: MCTSSA, Camp Pendleton, CA	WR	Oct 97			0	0	678	378	CONT	CONT
SPAWAR, Crystal City, VA/ San Diego, CA	CPFF/RCP	Mar 97	136	136	0	136	0	0	0	136

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

DATE **September 1997**

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206313M Marine Corps Communications Systems

PROJECT
C2270

EICOC: MCTSSA, Camp Pendleton, CA	WR	Oct 97	4697	4697	0	0	776	1058	2863	4697

	Total Prior to FY 1997	FY 1997	FY 1998	FY 1999	Budget to Complete	Total Program
Subtotal Product Development		8083	5039	7064	CONT	CONT
Subtotal Support and Management		1675	477	930	CONT	CONT
Subtotal Test and Evaluation		1407	1914	1954	CONT	CONT
Total Project		11165	7430	9948	CONT	CONT

C. (U) Funding Profile: Not Applicable.

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

DATE **September 1997**

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206313M Marine Corps Communications Systems

PROJECT
C2271

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
C2271 Maneuver C2 Systems	5278	1469	2127	1873	453	0	0	0	11200
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) $ 60 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) $ 3513 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 $ 5,278

(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) $ 200 DACT: Perform developmental and operational testing on DACT system.
- (U) $ 50 JTIDS: Continue support for the Joint JTIDS Link 16 IPT.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE September 1997
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0206313M Marine Corps Communications Systems	PROJECT C2271

- (U) $ 100 JTIDS: Continue JTIDS participation in DII COE working group.
- (U) $ 250 JTIDS: Initiate and develop the interface TYQ-JTIDS to other Aviation C2 Agencies..
- (U) $ 20 JTIDS: Program management support for various technical interchange meetings, demonstrations, and conferences.

(U)Total $ 1,469

(U) FY 1999 Planned Program:

- (U) $ 716 DACT: Begin Phase II software development.
- (U) $ 80 DACT: Perform regression and software support testing on Phase II software.
- (U) $ 50 JTIDS: Continue engineering support for the Class 2/2H Terminals which will be used in JTIDS common processor.
- (U) $ 461 JTIDS: Complete ECP to AN/TYQ JTIDS for TACC operations.
- (U) $ 800 JTIDS: Commence integration of real time/non-real time data feeds to AN/TYQ JTIDS.
- (U) $ 20 JTIDS: Program management support for various technical interchange meetings, demonstrations and conferences.

(U)Total $ 2,127

B. (U) Project Change Summary

	FY 1997	FY 1998	FY 1999
(U) Previous President's Budget	4139	1469	2121
(U) Adjustments to Previous President's Budget	+1139	0	+6
(U) Current Budget Submit	5278	1469	2127

(U) Change Summary Explanation:

(U) Funding: FY97 DACT: Decrease in funding ($158K) due to minor affordability changes.
JTIDS: Increase in funding ($1297K) due for the AN/TYQ JTIDS solution.
FY99 JTIDS: Increase in funding ($6K) due to NWCF surcharge.

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

C. (U) Other Program Funding Summary (APPN, BLI #, NOMEN)

	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	To Compl	Total Cost
(U) PMC, BLI #463200, DACT	5568	620	12,994	20351	12,332	5,095	8861	TBD	TBD

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

DATE **September 1997**

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206313M Marine Corps Communications Systems

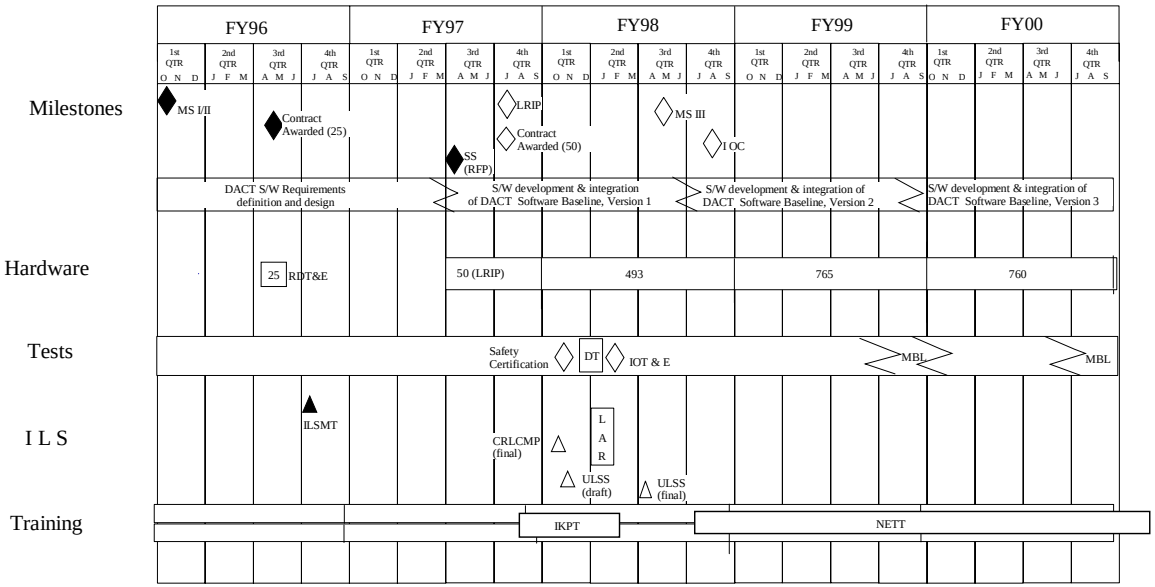
PROJECT
C2271

C. (U) Other Program Funding Summary (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	7,377	6,675	7,151	8,080	1,028	1,062	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)

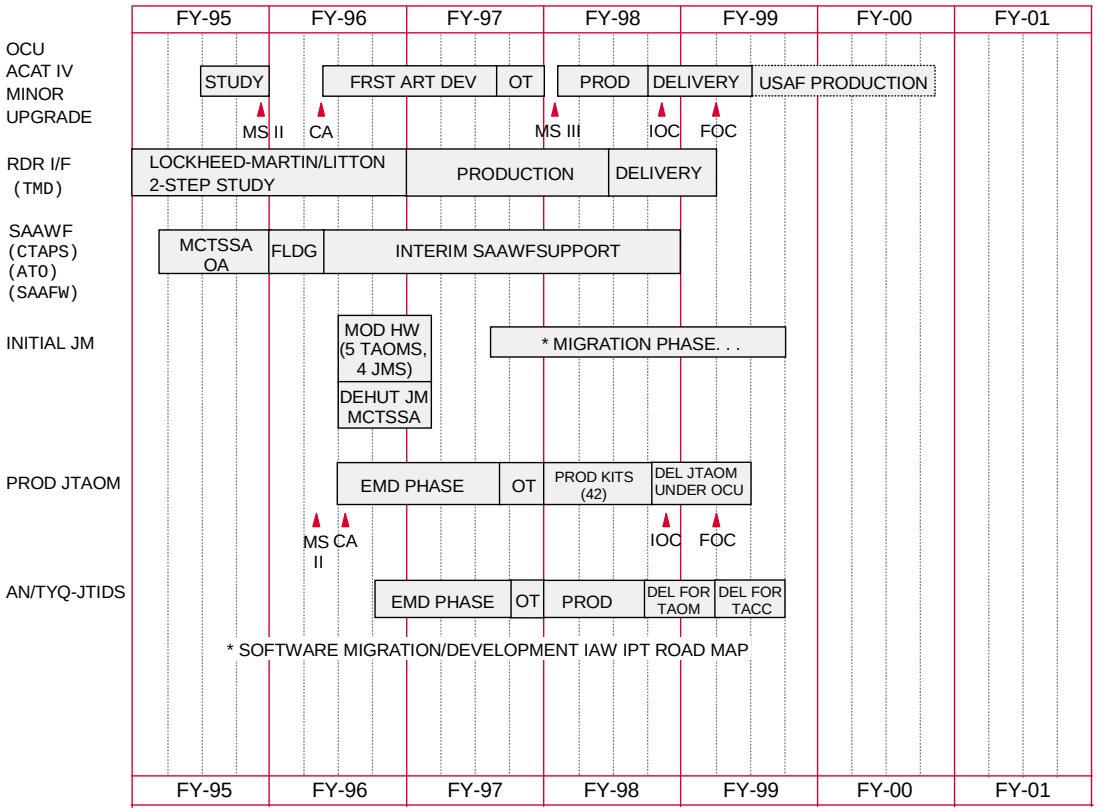
DATE **September 1997**

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206313M Marine Corps Communications Systems

PROJECT
C2271

JTIDS



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

DATE **September 1997**

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206313M Marine Corps Communications Systems

PROJECT
C2272

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
C2272 Intelligence C2 Systems	3516	3251	3569	4036	4153	4275	4410	Continuing	Continuing
Quantity of RDT&E Articles									

A. (U) <u>Mission Description and Budget Item Justification:</u> 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.

(U) FY 1997 Accomplishments:

- (U) $ 50 SIDS: Prepared research, development and testing documentation to be used for the milestone III/fielding decision.
- (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.
- (U) $ 344 TRSS: Completed Software Development for the Improved Air-Delivered Sensor (IADS), TRSS MAGTF C4I segment, and stored data retrieval software.
- (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.
- (U) $ 474 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.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE September 1997
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0206313M Marine Corps Communications Systems	PROJECT C2272

- (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).
- (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.
- (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.
- (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.
- (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.
- (U) $ 115 CTT: Final program support on CTT documentation.
- (U) $ 433 CTT: Engineering Support for CTT and JTT.

(U)Total $ 3,516

(U) FY 1998 Planned Program:

- (U) $ 53 SIDS: Complete modification of the COTS Scuba Dive-Bags.
- (U) $ 1810 TENCAP: Conduct advance technology demonstrations and integration into the established MAGTF C4I architecture.
- (U) $ 478 TENCAP: Conduct technical assessments of emerging national data dissemination capabilities.
- (U) $ 430 TENCAP: Continue to support operational planning to enhance operating force capabilities to US national intelligence data within the MAGTF C4I architecture.
- (U) $ 380 TENCAP: Evaluate the utility of emerging exploitation, automated and manual target recognition and detection tools.

(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.

(U)Total $ 3,251

(U) FY 1999 Planned Program:

- (U) $ 209 SIDS: Complete software upgrade to maintain NITFS standards and improve compression algorithms.
- (U) $ 1968 TENCAP: Continue advance technology demonstrations and integration into the established MAGTF C4I architecture.
- (U) $ 367 TENCAP: Continue technical assessments of emerging national data dissemination capabilities.

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

DATE **September 1997**

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206313M Marine Corps Communications Systems

PROJECT
C2272

- (U) $ 475 TENCAP: Continue to support operational planning to enhance operating force capabilities to US national intelligence data witin the MAGTF C4I architecture.
- (U) $ 450 TENCAP: Continue to evaluate the utility of emerging exploitation, automated and manual target recognition and detection tools.
- (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.

(U)Total $ 3,569

B. (U) Project Change Summary

	FY 1997	FY 1998	FY 1999
(U) Previous President's Budget	3978	3357	3576
(U) Adjustments to Previous President's Budget	-462	-106	-7
(U) Current Budget Submit	3516	3251	3569

(U) Change Summary Explanation:

(U) Funding: Adjustment in FY 97 is due to minor affordability adjustments in the amount of 462K.
Adjustment in FY 98 due to reduction in support of operation planning within MAGTF C4I architecture.
Adjustment in FY 99 due to NCWF surcharge.

(U) Schedule: N/A

(U) Technical: CTT will not intergrate with TERPES in FY97, TERPES will receive a JTT vice a CTT.

C. (U) Other Program Funding Summary (APPN, BLI #, NOMEN)

	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	To Compl	Total Cost
(U) PMC BLI 474700 Intelligence Support Equipment									
SIDS	6855	3371	0	0	0	0	0	0	10,226
CTT	958	2753	0	0	0	0	0	0	3,711
(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

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

DATE **September 1997**

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206313M Marine Corps Communications Systems

PROJECT
C2272

C. (U) Other Program Funding Summary (APPN, BLI #, NOMEN)	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	To Compl	Total Cost
SIDS	362	400	435	331	351	479	468	CONT	CONT

(U) Related RDT&E

(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

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

DATE **September 1997**

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206313M Marine Corps Communications Systems

PROJECT
C2272

D. (U) Schedule Profile:

SECONDARY IMAGERY DISSEMINATION SYSTEM
SIDS THERM IMAGER MILESTONE SCHEDULE
PE NO: 0206313M
PROJECT NO: C2272

PROGRAM MILESTONES	FY97 2NDQTR MSIII IOC	FY98 FOT&E 2NDQTR	FY99	FY00	FY01	FY02	FY03
ENGINEERING MILESTONES							
T&E MILESTONES							
CONTRACT MILESTONES							

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

DATE **September 1997**

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206313M Marine Corps Communications Systems

PROJECT
C2272

MILESTONE SCHEDULE
PROJECT TITLE: 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)

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

DATE **September 1997**

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206313M Marine Corps Communications Systems

PROJECT
C2272

A. (U) Project Cost Breakdown

	FY 1997	FY 1998	FY 1999
a. Program Management Support	115	0	0
b. Engineering Support	433	0	126
c. TENCAP Concept Development/Feasibility Demonstration	1348	2072	2533
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	274
h. Primary Hardware Development	400		
Total	3516	3251	3569

B. Budget Acquisition History and Planning Information

Performing Organizations

Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1997	FY 1997	FY 1998	FY 1999	Budget to Complete	Total Program
Product Development Organizations										
TENCAP	RCP	Jan 97			0	2392	2580	2907	CONT	CONT
MarCorSysCom, Quantico, VA										
Support and Management Organizations										
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	433	0	0	0	433
Fairfax, VA										
TENCAP	Various	Jan 97			0	454	618	453	CONT	CONT
Test and Evaluation Organizations										

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

DATE **September 1997**

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206313M Marine Corps Communications Systems

PROJECT
C2272

SIDS										
NAWC, PT Mugu	WR	Dec 96	384	384	0	122	53	209	0	384

	Total Prior to FY 1997	FY 1997	FY 1998	FY 1999	Budget to Complete	Total Program
Subtotal Product Development		2392	2580	2907	CONT	CONT
Subtotal Support and Management		1002	618	453	CONT	CONT
Subtotal Test and Evaluation		122	53	209	0	384
Total Project		3516	3251	3569	CONT	CONT

C. (U) Funding Profile: Not Applicable.

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

DATE **September 1997**

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206313M Marine Corps Communications Systems

PROJECT
C2273

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
C2273 Air Operations C2 Systems	7407	5328	6479	6412	2741	1366	1414	Continuing	Continuing
Quantity of RDT&E Articles									

A. (U) <u>Mission Description and Budget Item Justification:</u> 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. 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 dissemenate 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).

PROGRAM ACCOMPLISHMENTS AND PLANS

(U) FY 1997 Accomplishments:

- (U) $ 794 ADCP: Achieved MS III decision. Continued software enhancement to meet mature ADCP Operational Requirements Document (ORD) requirements.
- (U) $ 3653 TAOM: Completed Engineering Manufacturing Development (EMD) effort of Joint Tactical Information Distribution System (JTIDS) and development of TAOM/JTIDS interface.
- (U) $ 627 TAOM: Began development of Defense Information Infrastructure (DII) Common Operating Environment (COE) Tactical Air Data Information Link-Joint (TADIL-J) Common Segment.
- (U) $ 448 TAOM: Continued closed system (AYK-14) to open system migration.
- (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.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE September 1997
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0206313M Marine Corps Communications Systems	PROJECT C2273

- (U) $ 351 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.
- (U) $ 10 AV RDR: Continued reliability analysis and analysis of field identified deficiencies to Aviation Radars.
- (U) $ 10 AV RDR: Conducted/coordinated Life Cycle Management and Logistics Support Analysis.
- (U) $ 300 AV RDR: FY 1997 forward finances efforts in this PE and project.

(U)Total $ 7407

(U) FY 1998 Planned Program:

- (U) $ 213 ADCP: Continue software enhancements concentrating on incorporation of Variable Message Format (VMF) protocol.
- (U) $ 200 TAOM: Complete development of DII COE TADIL J Common Segment in preparation for MS III award during 1st qtr FY98.
- (U) $ 450 TAOM: Continue closed system (AYK-14) to open system migration.
- (U) $ 544 TAOM: Begin Theater Ballistic Missile Defense (TBMD) implementation into the TAOM.
- (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.
- (U) $ 2910 AV RDR: Anazlyze and develop ECP's to increase AN/TPS-59 radar detection and targeting capability within the Antenna Array Transmitters and Receivers.
- (U) $ 250 AV RDR: Fund Marine Corps Tactical Software Support Activity (MCTSSA) Software Support.
- (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.
- (U) $ 0 AV RDR: Analyze and develop ECP-s to increase AN/TPS-59 radar detection and targeting capability within the Antenna Arry Transmiters and Receivers. This effort forward finance with $300K FY97 funds from this PE and Project.

(U)Total $ 5,328

(U) FY 1999 Planned Program:

- (U) $ 219 ADCP: Continue software enhancements concentrating on incorporation of CEC interface.
- (U) $ 507 TAOM: Continue closed system (AYK-14) to open system migration.
- (U) $ 500 TAOM: Continue TMD implementation into the TAOC.
- (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.
- (U) $ 275 TAOM: Begin enhancements to TAOM voice gateway.
- (U) $ 63 AV RDR: Continue MCTSSA software support.
- (U) $ 100 CTAPS: Initiate USMC'S management of Theater Battle Management Core System (TBMCS) 1.0 development

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

DATE **September 1997**

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206313M Marine Corps Communications Systems

PROJECT
C2273

- (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.
- (U) $ 500 CAC2S: Initiate and complete engineering studies.
- (U) $ 2500 CAC2S: Initiate the migration of existing equipment to a prototype CAC2S suite of equipment.
- (U) $ 1000 CAC2S: Conduct exercises with prototype equipment to determine optimum equipment mix and organization.

(U) $ 575 AV RDR: Complete design, build prototype interface and test antenna array upgrades.

(U)Total $ 6479

B. (U) Project Change Summary

	FY 1997	FY 1998	FY 1999
(U) Previous President's Budget	6,972	5,328	2,369
(U) Adjustments to Previous President's Budget	+435	0	4,110
(U) Current Budget Submit	7,407	5,328	6,479

(U) Change Summary Explanation:

(U) Funding: FY 1997 adjustments of $435K is due to an increase in support development of ECP for AN/TPS-59, recognized increased costs during execution of the ADCP requirements, and decrease due to revised economic assumption. FY 1999 adjustments of $4100K is due to increase of $100K to support CTAPS TBMCS 1.0 development and $4000K for CAC2S to begin migration efforts to a common equipment baseline and increase of $7K due to NWCF surcharge and increase of $3K due to NWCF Surface Warfare Center rate adjustment.

(U) Schedule: Not Applicable

(U) Technical: Not applicable

C. (U) Other Program Funding Summary (APPN, BLI #, NOMEN)

	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	To Compl	Total Cost
(U) PMC, BLI#464000, TAOM/CTAPS	8500	9,371	11,721	3,084	5,653	2,668	5,226	CONT	CONT
(U) PMC, BLI#463700, ADCP	0	55	2,156	896	291	152	76	CONT	CONT
(U) PMC, BLI#463600, TPS-59 RADAR	38,711	5,937	8,507	8,008	9,782	0	0	0	70,945
(U) O&M, TAOM	0	0	0	0	0	0	0	0	0
(U) O&M, ADCP	0	212	193	0	0	0	0	0	405
(U) O&M, AN/TPS-59	0	0	0	0	0	0	0	0	0
(U) Related RDT&E									

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

DATE **September 1997**

BUDGET ACTIVITY
7 - Operational System Development

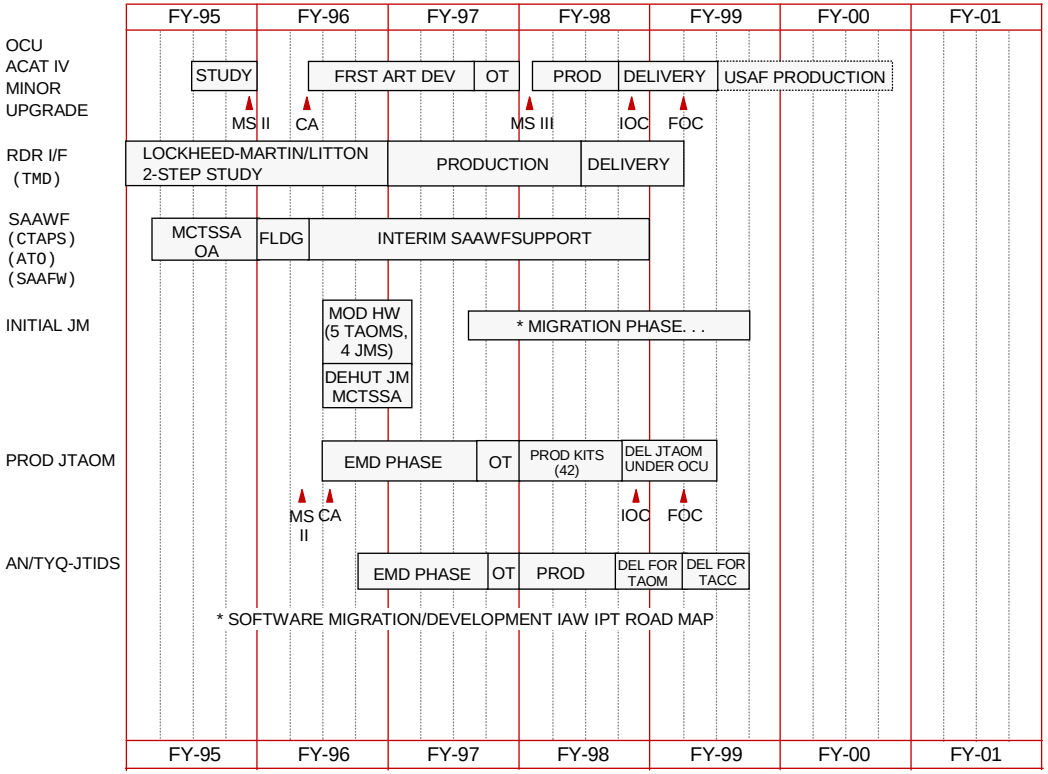
PE NUMBER AND TITLE
0206313M Marine Corps Communications Systems

PROJECT
C2273

PE 0603216C (Ballistic Missile Defense Organization, Theater Missile Defense)

D. (U) Schedule Profile

TAOM MILESTONE



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

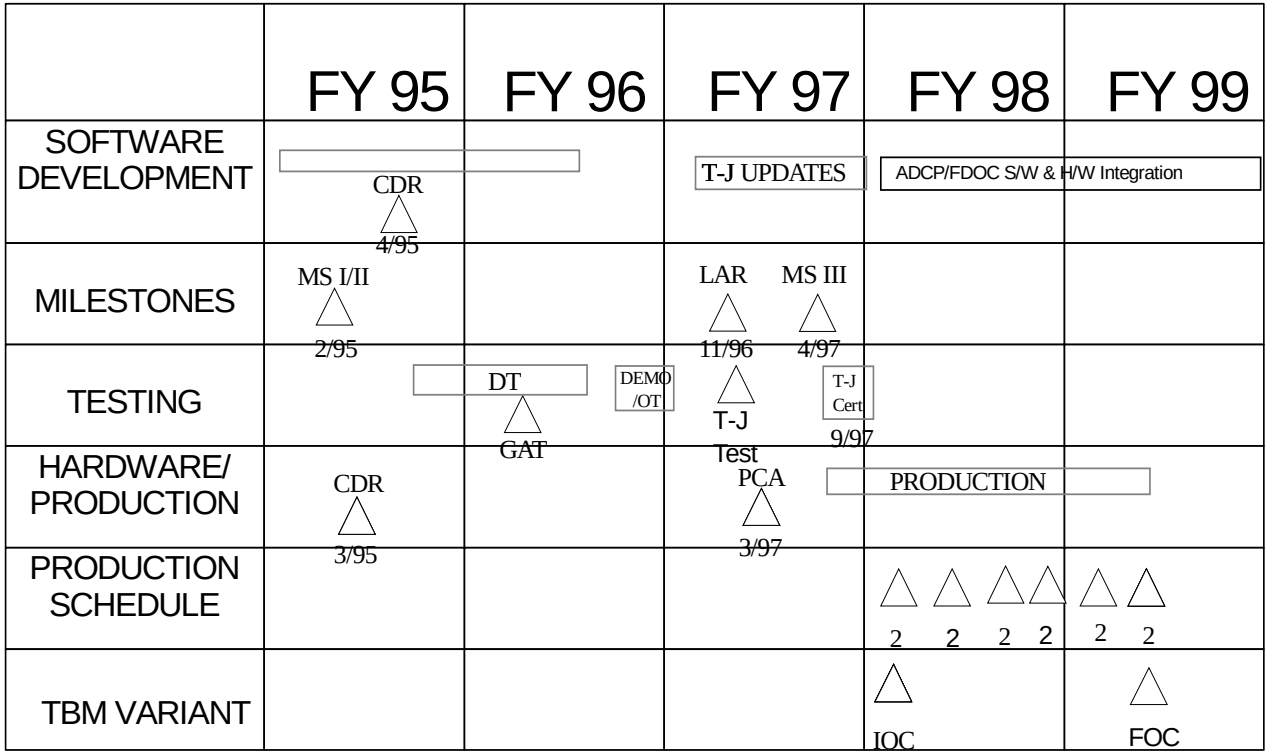
DATE **September 1997**

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206313M Marine Corps Communications Systems

PROJECT
C2273

ADCP MILESTONE



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

DATE September 1997

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206313M Marine Corps Communications Systems

PROJECT
C2273

A. (U) Project Cost Breakdown

	FY 1997	FY 1998	FY 1999
Software Development	1,242	1,113	1,357
Configuration Management	4343	0	0
Development Support Equipment Acquisition	600	0	0
Systems Engineering	0	3,454	1,200
Developmental Test and Evaluation	0	0	1000
Prototype Hardware Development	0	0	2,500
Program Management Support	1,222	761	422
Total	7407	5328	6479

B. Budget Acquisition History and Planning Information

Performing Organizations

Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1997	FY 1997	FY 1998	FY 1999	Budget to Complete	Total Program
Product Development Organizations										
Litton Data Systems Augora Hills, CA	SS/CPAF/ RCP	Mar 97			0	3,653	1,194	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	MIPR	Nov 96			0	100	28	34	CONT	CONT
Lockheed Martin, Syracuse NY	C/CPFF	Oct 96			0	300	2,910	617	CONT	CONT
ESC, Hanscom AFB, MA	MIPR	Oct 96	158	158	0	158	0	0	0	158

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

DATE **September 1997**

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206313M Marine Corps Communications Systems

PROJECT
C2273

3rd 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
Support and Management Organizations										
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	250	273	CONT	CONT
CSC Dumfries VA	CPFF	Oct 96			0	1255	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
Test and Evaluation Organizations										
TBD	WR	Oct 98			0	0	0	1000	CONT	CONT

	Total Prior to FY 1997	FY 1997	FY 1998	FY 1999	Budget to Complete	Total Program
Subtotal Product Development		5006	4132	4831	CONT	CONT
Subtotal Support and Management		2401	1196	648	CONT	CONT
Subtotal Test and Evaluation				1000	CONT	CONT
Total Project		7407	5328	6479	CONT	CONT

C. (U) Funding Profile: Not Applicable.

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

DATE **September 1997**

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206313M Marine Corps Communications Systems

PROJECT
C2274

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
C2274 C2 Warfare Systems	3878	3390	4068	3936	3381	3937	4688	Continuing	Continuing
Quantity of RDT&E Articles									

A. (U) <u>Mission Description and Budget Item Justification:</u> 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 Communications Intelligence (COMINT) System (TPCS) 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.

PROGRAM ACCOMPLISHMENTS AND PLANS

(U) FY 1997 Accomplishments:

- (U) $ 1000 TERPES: Continued upgrades to TERPES mission planning software to maintain compatibility with EA-6B aircraft software changes.
- (U) $ 763 TERPES: Initiated development of Tactical Automated Sanitation capability or similar Multi-Level Security (MLS) device or procedure.
- (U) $ 1184 TERPES: Completed Developmental Testing and Interoperability Testing of TERPES Downsize effort (TPU).
- (U) $ 55 TERPES: Completed IOT&E of TERPES Downsize effort (TPU).
- (U) $ 876 MEWSS: Completed USMC-unique integration activity for common sensor suite.

(U)Total $ 3,878

(U) FY 1998 Planned Program:

- (U) $ 290 MEWSS: Initiate USMC unique cost share of Army's continued subsystem development to target evolving threat communications and non-communications emitters, and electronic attack.
- (U) $ 260 MEWSS: Support participation in Initial Operational Test & Evaluation. Achieved MSIII.
- (U) $ 313 TPCS: Funds remaining TPCS upgrade software development to control and exploit special signal receivers and analysis tools.
- (U) $ 160 TPCS: Fund Streamlined Operational Test (SOT) of TPCS Phase I Upgrade for special signal/DF receiver.
- (U) $ 187 TPCS: Systems Engineering and Technical Assistance (SETA).

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE September 1997
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0206313M Marine Corps Communications Systems PROJECT C2274

- (U) $ 1000 TERPES: Continue upgrades to TERPES mission planning software to maintain compatibility with the EA-6B aircraft software changes. Achieved MSIII for Phase III configuration.
- (U) $ 605 TERPES: Continue development of Tactical Automation Sanitation capability or similar Multi-Level Security (MLS) device or procedure.
- (U) $ 575 TERPES: Begin software development of Link 16 Tadil J to be incorporated into fusion processor.

(U)Total $ 3,390

(U) FY 1999 Planned Program:

- (U) $ 295 MEWSS: Continue USMC unique cost share of Army's continued subsystem development to target evolving threat communications and non-communications emitters, and electronic attack.
- (U) $ 161 MEWSS: Development efforts in support of Electronic Attack capabilities.
- (U) $ 320 TPCS: Transition to TOPHUNTER 2.0 software to Defense Information Infrastructure (DII) common operating environment (COE).
- (U) $ 217 TPCS: Fund Phase II IOT&E of TPCS Upgrade.
- (U) $ 305 TPCS: Software revisions to TOPHUNTER 2.0 software.
- (U) $ 301 TPCS: Hardware revisions to TPCS Upgrade. Achieve MSIII Phase II.
- (U) $ 187 TPCS: Systems Engineering and Technical Assistance (SETA).
- (U) $ 976 TERPES: Continue development of TERPES mission planning software to maintain compatibility with the EA-6B aircraft software changes.
- (U) $ 581 TERPES: Complete development of Tactical Automation Sanitation capability or similar Multi-Level Security (MLS) device or procedure.
- (U) $ 450 TERPES: Continue software development of Link 16 Tadil J to be incorporated into fusion processor.
- (U) $ 275 TERPES: Begin development of advanced communication suite upgrade for Joint interoperability communications suite software changes.

(U)Total $ 4,068

B. (U) Project Change Summary

	FY 1997	FY 1998	FY 1999
(U) Previous President's Budget	3369	3390	4012
(U) Adjustments to Previous President's Budget	+509	0	56
(U) Current Budget Submit	3878	3390	4068

(U) Change Summary Explanation:

	DATE September 1997
BUDGET ACTIVITY **7 - Operational System Development**	PE NUMBER AND TITLE **0206313M Marine Corps Communications Systems**

(U) Funding:

FY 1997 adjustments are due to a decrease of $43 for minor affordability adjustments for TERPES, a plus-up of $552 for MEWSS to cover unexpected test refurbishment costs.
FY 1999 adjustments are due to an increase of $16K for NWCF surcharge and $40K for NWCF R&D Air Warfare Centers.

(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&E for this complex system.

(U) Technical: N/A

C. (U) Other Program Funding Summary (APPN, BLI #, NOMEN)	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	To Compl	Total Cost
(U) PMC BLI 474900 Modification Kits INTEL									
TERPES	1125	4418	0	3970	0	3019	0	0	12532
(U) PMC BLI 463600 Modification Kits									
MAGTF C4I									
MEWSS	11120	14672	15113	22626	23391	4608	0	0	91530
(U) PMC BLI 474900 Modification Kits INTEL									
TPCS	0	0	3191	2910	2108	0	0	0	8209
(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	0	87	317	92	0	0	0	2919

(U) Related RDT&E

(U) PE 0604270A (Intelligence and Electronic Warfare Common Sensor (IEWCS), TACJAM-A).

(U) MEWSS is fully integrated in the IEWCS program as a fourth platform.

(U) PE 0305885G (Tactical Cryptologic Program)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE September 1997
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 II LAR	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 LAR				Sep-Oct	
MS III				Dec	
IOC					Sep
FOC					Mar

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

DATE **September 1997**

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206313M Marine Corps Communications Systems

PROJECT
C2274

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						

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

DATE **September 1997**

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206313M Marine Corps Communications Systems

PROJECT
C2274

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
PROGRAM MILESTONES		2Q MSII	4Q Production Decision	4Q MS III (Phase II)		4Q IOC	4Q FOC
ENGINEERING MILESTONES			1Q CDR				
T&E MILESTONES			2Q OA 2Q DT (Phase I)	2Q OT&E (Phase II)	3Q FOT&E (Phase II)		
CONTRACT MILESTONES		4Q TOP RIGGER EMD		2Q Production			

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

DATE September 1997

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206313M Marine Corps Communications Systems

PROJECT
C2274

A. (U) Project Cost Breakdown

	FY 1997	FY 1998	FY 1999
a. System Design/Integration/Development	1773	1290	1395
b. Development Testing/Operational Testing	1239	420	434
c. Management Support Services	342	1037	1038
d. Software Development		313	625
e. Primary Hardware Development	524	330	576
Total	3878	3390	4068

B. Budget Acquisition History and Planning Information

Performing Organizations

Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1997	FY 1997	FY 1998	FY 1999	Budget to Complete	Total Program
Product Development Organizations										
MEWSS										
Raytheon E-System	CPAF	Jan 97	876	876		876	0	0	0	876
Lockheed Martin Fed Sys, Owego	CPFF	Jun 98				0	550	456	CONT	CONT
TPCS										
BTG	CPFF	Oct 97				0	313	926	CONT	CONT
TERPES										
NAWCWPNS,	WR	Oct 96				897	1000	1100	CONT	CONT
Pt Mugu, CA	RCP	Oct 96				523	330	331	CONT	CONT
Support and Management Organizations										
TPCS										
TBD	CPFF	Oct 96				310	1037	1038	CONT	CONT
TERPES										

NAWCWPNS, Pt Mugu, CA	WR	Oct 96	32	32	0	32	0	0	0	32
Test and Evaluation Organizations										
TPCS										
TEXCOM	MIPR	Jan 98				0	160	217	CONT	CONT
TERPES										
NAWCWPNS Pt Mugu, CA	RCP	Oct 96	1240	1240	0	1240	0	0	0	1240

	Total Prior to FY 1997	FY 1997	FY 1998	FY 1999	Budget to Complete	Total Program
Subtotal Product Development		2296	2193	2813	CONT	CONT
Subtotal Support and Management		342	1037	1038	CONT	CONT
Subtotal Test and Evaluation		1240	160	217	CONT	CONT
Total Project		3878	3390	4068	CONT	CONT

C. (U) Funding Profile: Not Applicable.

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

DATE **September 1997**

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206313M Marine Corps Communications Systems

PROJECT
C2275

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	364	3107	3002	5203	2399	746	746	Continuing	Continuing
Quantity of RDT&E Articles									

A. (U) <u>Mission Description and Budget Item Justification:</u> 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 connot 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 programmatics documentation.

PROGRAM ACCOMPLISHMENTS AND PLANS

(U) FY 1997 Accomplishments:

- (U) $ 24 GMF: Developed and updated Life Cycle Cost Estimate (LCCE)
- (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 $ 364

	DATE September 1997
BUDGET ACTIVITY **7 - Operational System Development**	PE NUMBER AND TITLE **0206313M Marine Corps Communications Systems**

(U) FY 1998 Planned Program:

- (U) $ 348 GMF: Support integrated logistic support, documentation development and program management.
- (U) $ 534 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) $ 900 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)Total $ 3,107

(U) FY 1999 Planned Program:

- (U) $ 1504 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: Commence 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 $ 3,002

B. (U) Project Change Summary

	FY 1997	FY 1998	FY 1999
(U) Previous President's Budget	402	2507	2592
(U) Adjustments to Previous President's Budget	-38	600	410
(U) Current Budget Submit	364	3107	3002

(U) Change Summary Explanation:

(U) Funding: FY97 changes were due to SBIR transfer, minor affordability adjustments, and revised economic assumption.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE September 1997
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0206313M Marine Corps Communications Systems	PROJECT C2275

FY98 & FY99 change due to EPLRS new start, minor affordability adjustments, and NWCF surcharge.

(U) Schedule: N/A

(U) Technical: N/A

C. (U) Other Program Funding Summary (APPN, BLI #, NOMEN)	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	To Compl	Total Cost
(U) PMC BLI 463300 RADIO SYS, GMF	0	0	8452	27318	26898	0	0	0	62668
(U) PMC BLI 463300 RADIO SYS , SINCGARS	40307	16907	8943	5194	0	0	0	0	71351
(U) PMC BLI 463300 RADIO SYS, GPRR	0	0	0	0	0	13525	14773	Cont	Cont
(U) PMC BLI 463300 RADIO SYS, AN/PSC-5	148	4596	0	0	0	0	0	0	4744
(U) PMC BLI 463300 RADIO SYS, EPLRS			24600	3000	2500	0	0	0	30100
(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

(U) Related RDT&E

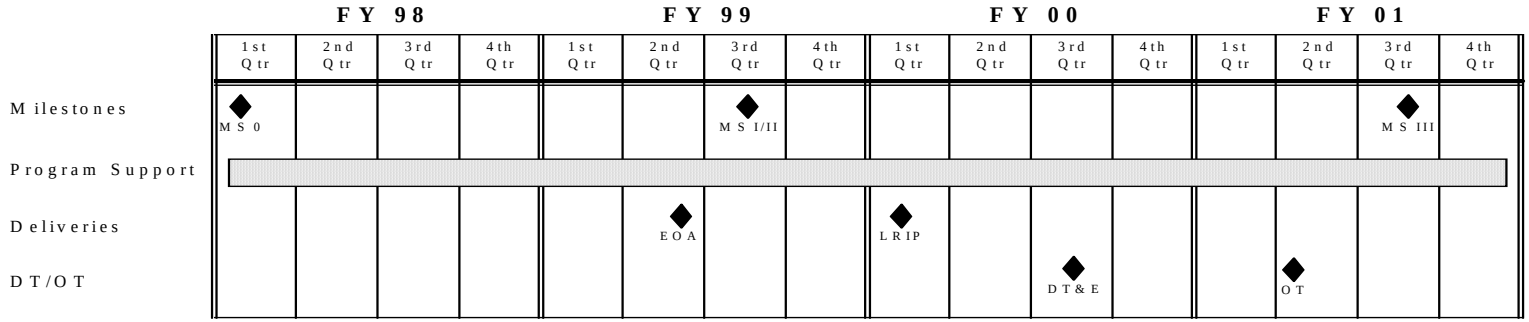
(U) PE 0303140N (Information Systems Security Plan) Project X0734, Communications Security Research and Development

(U) PE 0604805A (Command, Control, and Communications Systems Engineering Development) SINCGARS (V)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE September 1997
BUDGET ACTIVITY **7 - Operational System Development**	PE NUMBER AND TITLE **0206313M Marine Corps Communications Systems**
	PROJECT **C2275**

D. (U) Schedule Profile:

GPPR SCHEDULE PROFILE



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

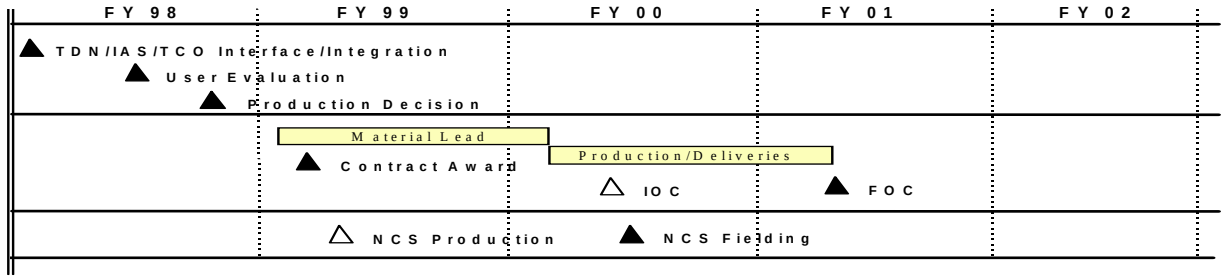
DATE **September 1997**

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206313M Marine Corps Communications Systems

PROJECT
C2275

E P L R S



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

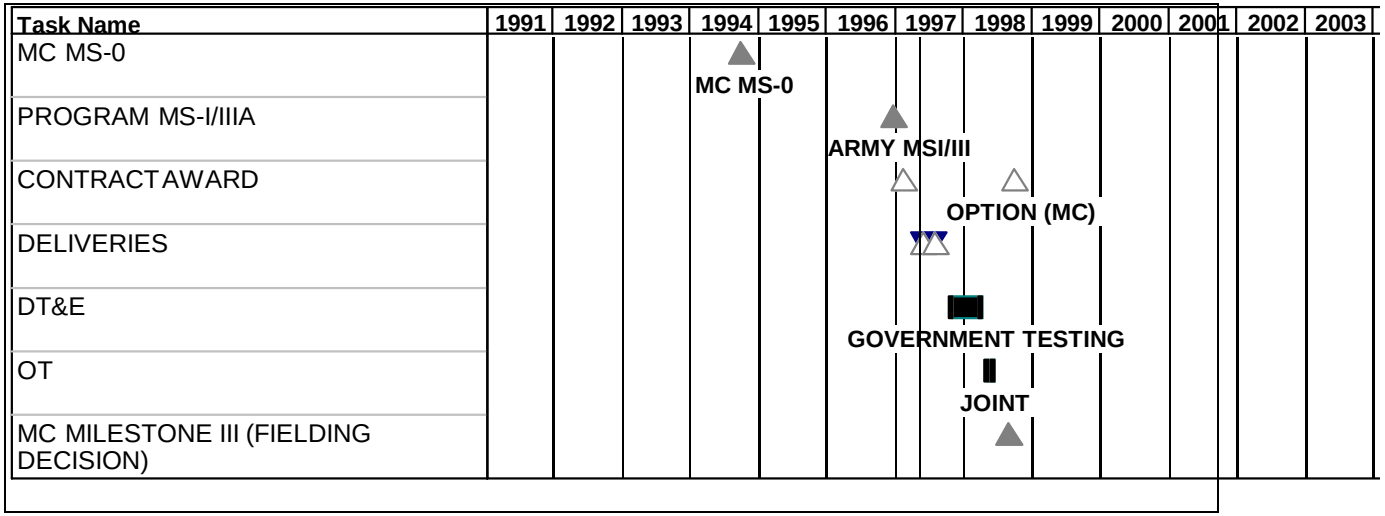
DATE **September 1997**

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206313M Marine Corps Communications Systems

PROJECT
C2275

GMF



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

DATE September 1997

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206313M Marine Corps Communications Systems

PROJECT
C2275

A. (U) Project Cost Breakdown	FY 1997	FY 1998	FY 1999
Contractor Engineering Support			
SINCGARS	20	0	0
GPRR	0	799	1504
EPLRS	0	235	75
Developmental Test and Evaluation			
EPLRS	0	350	75
Program Management Support			
GMF	24	348	0
GPRR	0	210	350
AN/PSC-5	100	0	0
EPLRS	0	315	50
System Engineering			
SINCGARS	220	0	0
GPRR	0	0	250
JTCS	0	0	498
EPLRS	0	850	200
Total	364	3107	3002

B. Budget Acquisition History and Planning Information

Performing Organizations

Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1997	FY 1997	FY 1998	FY 1999	Budget to Complete	Total Program
Product Development Organizations										
SINCGARS										
Joint Spectrum Center Annapolis	CPFF/Reqn	Oct 96	220	220		220	0	0	0	220
GPRR: TBD	TBD	Oct 97	8848	8848		0	1009	2104	5735	8848

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

DATE **September 1997**

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206313M Marine Corps Communications Systems

PROJECT
C2275

JTCS: TBD	TBD	Oct 98			0	0	498	CONT	CONT
EPLRS: TBD	TBD	Oct 97	2150	2150	0	1750	400	0	2150
Support and Management Organizations									
SINCGARS: JSC ANNAPOLIS MD	CPFF/Reqn	Oct 96	20	20	20	0	0	0	20
GMF: VRI DUMFRIES VA	CFFP/Reqn	Aug 96	25	25	24	0	0	0	25
GMF: TBD	CFFP/Reqn	Oct 97	348	348	0	348	0	0	348
PSC5: NSWC DAHLGREN VA	WR	Mar 97	100	100	100	0	0	0	100
Test and Evaluation Organizations									
Not Applicable									

	Total Prior to FY 1997	FY 1997	FY 1998	FY 1999	Budget to Complete	Total Program
Subtotal Product Development		220	2759	3002	CONT	CONT
Subtotal Support and Management		144	348	0	0	492
Subtotal Test and Evaluation						
Total Project		364	3107	3002	CONT	CONT

C. (U) Funding Profile: Not Applicable.

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

DATE **September 1997**

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206313M Marine Corps Communications Systems

PROJECT
C2276

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
C2276 Communications Switching and Control System	3333	2084	2143	1784	1880	0	0	0	11224
Quantity of RDT&E Articles									

A. (U) <u>Mission Description and Budget Item Justification:</u> 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.

(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 reprocurement 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.

(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.

(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.

(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

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE September 1997
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0206313M Marine Corps Communications Systems	PROJECT C2276

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)$ 1319 DTC: Conducted Operational Test; Prepared for Milestone III/Approval for Service Use.
- (U)$ 194 ULCS PIP:Completed ULCS software development for ULCS PIP.
- (U)$ 1820 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 $ 3333

(U) FY 1998 Planned Program:

- (U)$ 436 DTC: Development and Engineering system technology upgrades. Achieve MS III decision.
- (U)$ 360 DMS: Support software and hardware integration/testing. Incorporate evolutionary security products into the unclassified DMS architecture within a Marine Corps-unique network infrastructure.
- (U)$ 1288 TDN: Develop TDN Block II and Software/hardware integration/testing. Achieve MS III decision block I.

(U)Total $ 2,084

(U) FY 1999 Planned Program:

- (U)$ 446 DTC: Engineering/testing system technology upgrades. Obtain MS III for ATM upgrade.
- (U)$ 367 DMS: Support software and hardware integration/testing. Incorporate evolutionary security products into the unclassified DMS architecture within a Marine Corps-unique network infrastructure.
- (U)$ 1330 TDN: Develop TDN Block II and software/hardware integration/testing. Achieve MS III decision for Block II.

(U)Total $ 2,143

B. (U) Project Change Summary	FY 1997	FY 1998	FY 1999
(U)Previous President's Budget	2720	2084	2135

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

DATE **September 1997**

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206313M Marine Corps Communications Systems

PROJECT
C2276

B. (U) Project Change Summary

	FY 1997	FY 1998	FY 1999
(U)Adjustments to Previous President's Budget	+613	0	+8
(U)Current Budget Submit	3333	2084	2143

(U) Change Summary Explanation:

(U) Funding: FY 1997 change is to an increase of $668 due to internal adjustments to cover program deficiencies in support of TDN software testing and integration of Block I and ULCS software development and a decrease of $55 for minor affordability adjustment. FY 1999 increase is due to NWCF surcharge.

(U) Schedule: N/A
(U) Technical: N/A

C. (U) Other Program Funding Summary

	FY1997	FY1998	FY1999	FY2000	FY2001	FY2002	FY2003	To Comple	Total Cost
(U)PMC BLI 463400 Communications Switching and Control Systems									
DTC	0	11634	18848	35201	27	0	0	0	65,710
TDN	0	25636	50756	38562	11374	0	0		126328
ULCS	9798	0	0	0	0	0	0	0	9798
DMS	4244	7471	4600	7689	3384	0	0	0	27388
(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

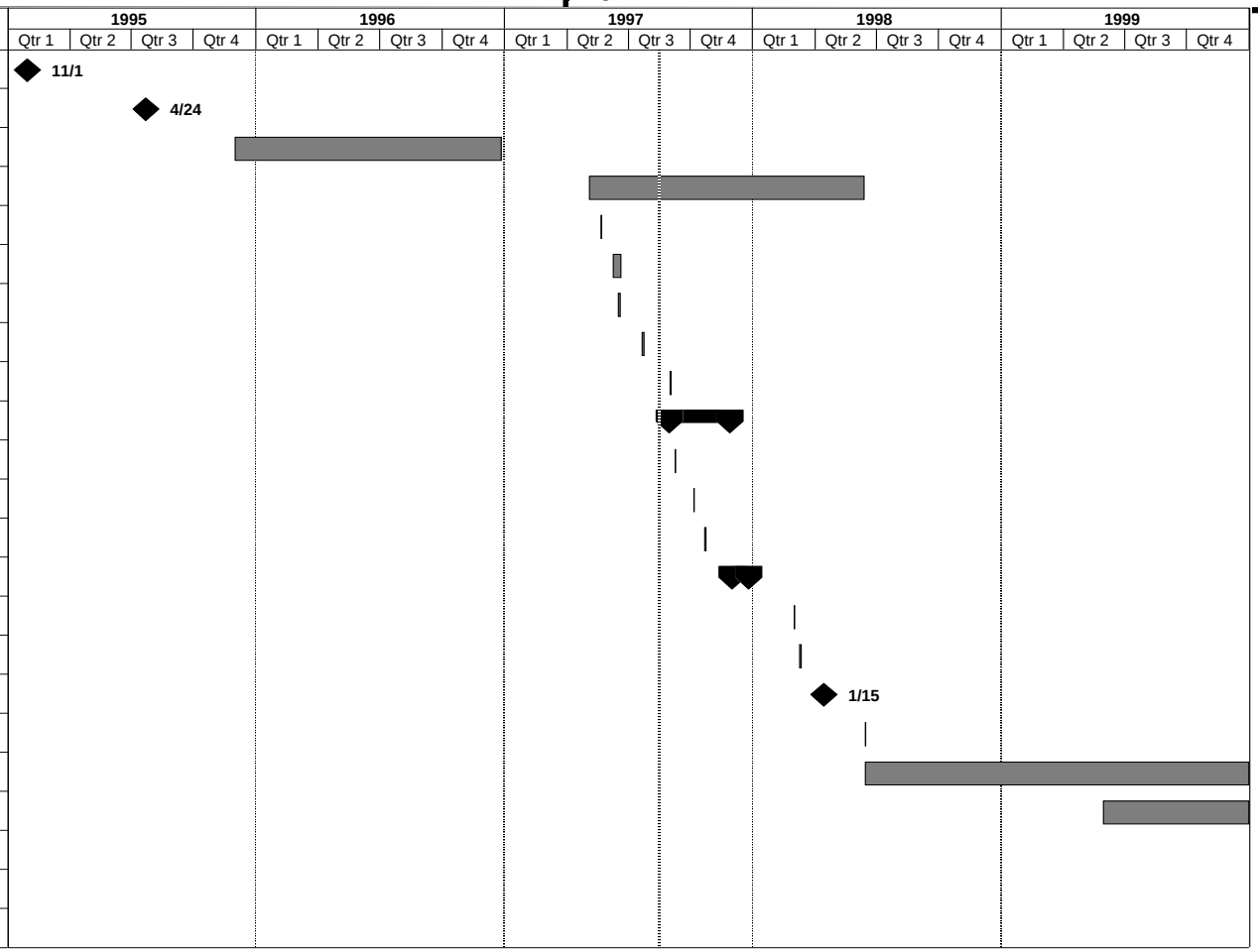
D. (U) Schedule Profile: DTC

DATE
September 1997

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206313M Marine Corps Communications Systems

ID	Task Name
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	**OT Tech Controller Training**
18	TM due to MCOTEA
19	OT Readiness Review
20	Joint TPWG @ Ft Huachuca
21	**Operational Test**
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



RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)		DATE September 1997
BUDGET ACTIVITY **7 - Operational System Development**	PE NUMBER AND TITLE **0206313M Marine Corps Communications Systems**	PROJECT **C2276**

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

DATE **September 1997**

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206313M Marine Corps Communications Systems

PROJECT
C2277

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
C2277 Systems Engineering and Integration	14859	243	6615	5839	3010	3015	3015	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.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE September 1997
BUDGET ACTIVITY **7 - Operational System Development**	PE NUMBER AND TITLE **0206313M Marine Corps Communications Systems**	PROJECT **C2277**

PROGRAM ACCOMPLISHMENTS AND PLANS

(U) FY 1997 Accomplishments:

- (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) $ 1,648 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) $ 2,472 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 $ 14,859

(U) FY 1998 Planned Program:

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE September 1997
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0206313M Marine Corps Communications Systems	PROJECT C2277

- (U) $ 243 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.
- (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.
- (U) $ 0 MAGTF SE&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.
- (U) $ 0 MAGTF SE&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.
- (U) $ 0 MAGTF SE&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.

(U)Total $ 243

(U) FY 1999 Planned Program:

- (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.
- (U) $ 2,784 MAGTF SE&I: Initiate Independent Verification and Validation (IV&V) to certify that all MAGTF C4I systems are Year 2000 complaint.
- (U) $ 2,787 MAGTF SE&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.
- (U) $ 250 JSTARS: Perform tests and exercise with the JSTARS CGS and JSTARS Connectivity prototype(s)

(U)Total $ 6,615

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

DATE **September 1997**

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206313M Marine Corps Communications Systems

PROJECT
C2277

B. (U) Project Change Summary

	FY 1997	FY 1998	FY 1999
(U) Previous President's Budget	14,985	3,312	5,426
(U) Adjustments to Previous President's Budget	-126	-3069	1,189
(U) Current Budget Submit	14,859	243	6,615

(U) Change Summary Explanation:

(U) Funding: FY 1997 decrease is due to minor affordability adjustments.
FY 1998 funding adjustment is due to a realignment of $3069 to support the MSBL (C2270) software migration.
FY 1999 funding adjustment is due to a realignment of $1611 to C2270 in support of the MSBL migration effort and an increase of $2784 to initiate IV&V effort.

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

C. (U) Other Program Funding Summary
(APPN, BLI #, NOMEN)

	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	To Compl	Total Cost

(U) Not applicable.

(U) Related RDT&E Not applicable.

D. (U) Schedule Profile Not applicable.

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

DATE September 1997

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206313M Marine Corps Communications Systems

PROJECT
C2277

A. (U) Project Cost Breakdown

	FY 1997	FY 1998	FY 1999
Software Development/Integration Testing	5642	243	250
Civilian Salaries	1840	0	778
Program Management Support	491	0	146
Systems Engineering PM Support	5583	0	0
Development Support Equipment Acquisition	591	0	2585
Test/Certification	529	0	2856
Training	183	0	0
Total	14859	243	6615

B. Budget Acquisition History and Planning Information

Performing Organizations

Contractor or Government Performing Activity	Contract Method/ Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1997	FY 1997	FY 1998	FY 1999	Budget to Complete	Total Program
Product Development Organizations										
JWID										
MCTSSA, Camp Pendleton, CA	WR	Oct 96	481	481	0	238	243	0	0	481
JINTACCS										
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
MAGTF SE&I										
INRI, Reston, VA	SS/CPFF	Oct 96	1618	1618	0	1618	0	0	0	1618
Forward Finance										
INRI, Reston, VA	SS/CPFF	Oct 97	1057	1057	0	1057	0	0	0	1057

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

DATE **September 1997**

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206313M Marine Corps Communications Systems

PROJECT
C2277

Forward Finance										
MCTSSA, Camp Pendleton, CA	WR	Oct 97	1082	1082	0	1082	0	0	0	1082
MAGTF SE&I										
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
GCCS										
NISE EAST	RCP	Jun 97	1104	1104	0	1104	0	0	0	1104
JSTARS										
MCTSSA, Camp Pendleton, CA	TBD	TBD	250	250	0	0	0	250	0	250
Support and Management Organizations										
JWID										
TBD					0	0	0	794	CONT	CONT
JINTACCS										
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
MAGTF SE&I										
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
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

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

DATE September 1997

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206313M Marine Corps Communications Systems

PROJECT
C2277

MCTSSA, Camp Pendleton, CA	WR	Oct 97	953	953	0	953	0	0	0	953
Forward Finance	RCP	Oct 96	122	122	0	122	0	0	0	122
NAWC AD, St Inigoes, MD										
Forward Finance	C/CPFF	Oct 97	1297	1297	0	1297	0	0	0	1297
TBD (Omnibus Contract)										
TBD		Oct 98			0	0	0	2787	CONT	CONT
GCCS										
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
RHHC										
NAWC/Hughes	WR	Dec 96	353	353	0	353	0	0	0	353
C4I										
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
Test andEvaluation Organizations										
MAGTF										
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	2784	CONT	CONT
GCCS										
NISE EAST, St. Inigoes, MD	RCP	Jun 97	279	279	0	279	0	0	0	279

						DATE September 1997
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0206313M Marine Corps Communications Systems					

	Total Prior to FY 1997	FY 1997	FY 1998	FY 1999	Budget to Complete	Total Program
Subtotal Product Development		7126	243	250	CONT	CONT
Subtotal Support and Management		7188	0	3581	CONT	CONT
Subtotal Test and Evaluation		545	0	2784	CONT	CONT
Total Project		14859	243	6615	CONT	CONT

C. (U) Funding Profile: Not Applicable.

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

DATE **September 1997**

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206313M Marine Corps Communications Systems

PROJECT
C2278

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
C2278 Air Defense Weapons Systems	809	817	2041	865	890	917	944	Continuing	Continuing
Quantity of RDT&E Articles									

A. (U) Mission Description and Budget Item Justification:

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, formerly known as HAWK) 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 HAWK viable until the year 2007. (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.

PROGRAM ACCOMPLISHMENTS AND PLANS

(U) FY 1997 Accomplishments:

- (U) $ 230 EADS: Continued pursuing Engineering Change Proposals (ECP) for correcting hardware and software deficiencies thereby maintaining system viability. Currently scheduled ECPs include Identification Friend or Foe/Continuous Wave Acquisition Radar (IFF/CWAR) integration, CWAR False First Hits, CWAR Bite diagnostics.
- (U) $ 579 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.

(U)Total $ 809

(U) FY 1998 Planned Program:

- (U) $ 817 EADS: Continue pursuing ECPs for correcting hardware and software deficiencies thereby maintaining system viability.

(U)Total $ 817

(U) FY 1999 Planned Program:

- (U) $ 838 EADS: Continue pursuing ECPs for correcting hardware and software deficiencies thereby maintaining system viability.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE September 1997
BUDGET ACTIVITY **7 - Operational System Development**	PE NUMBER AND TITLE **0206313M Marine Corps Communications Systems**	PROJECT **C2278**

- (U)$ 1203 Identification Friend or Foe (IFF) continuous wave acquistion radar integration.

(U)Total $ 2041

B. (U) Project Change Summary

	FY 1997	FY 1998	FY 1999
(U) Previous President's Budget	809	817	838
(U) Adjustments to Previous President's Budget	0	0	+1203
(U) Current Budget Submit	809	817	2041

(U) Change Summary Explanation:

(U) Funding: Adjustments in FY 1997 due to minor affordability changes and SBIR transfer.
FY 1999 increase due to realignment of Marine Corps efforts to Identification Friend or Foe (IFF) and NWCF surcharge.

(U) Schedule: N/A

(U) Technical: N/A

C. (U) Other Program Funding Summary

	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	To Compl	Total Cost
(U) PMC LINE BLI 300600 HAWK MOD	2,775	3,475	2,018	1,570	1,619	1,669	1,725	CONT	CONT
(U) PMC LINE BLI 301300 PMS-AVENGER	10,552	4,217	222	229	236	3,690	3,907	CONT	CONT
(U) O&M EADS/HAWK	0	512	527	484	497	511	526	CONT	CONT
(U) O&M AVENGER	5	615	1,214	1,247	1,280	1,304	1,350	CONT	CONT

(U) Related RDT&E
PE 0603216C (Ballistic Missile Defense Organization, Theater Missile Defense)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE September 1997
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0206313M Marine Corps Communications Systems	PROJECT C2278

D. (U) Schedule Profile

AVENGER

ID	TASK NAME	DURA-TION	97 QTR 1 2 3 4	98 QTR 1 2 3 4	99 QTR 1 2 3 4	00 QTR 1 2 3 4	01 QTR 1 2 3 4
1	ICOFT S/W UPGRADE	174d	[redacted]				
2	AVENGER OBSOLESC.	108d	[redacted]				
3	AVENGER EADS S/W	282d	[redacted]				

-

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

DATE September 1997

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206313M Marine Corps Communications Systems

PROJECT
C2278

A. (U) Project Cost Breakdown

	FY 1997	FY 1998	FY 1999
Project Management Support	91	92	192
Software Development	528	530	1033
Systems Engineering	190	195	816
Total	809	817	2041

B. Budget Acquisition History and Planning Information

Performing Organizations

Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1997	FY 1997	FY 1998	FY 1999	Budget to Complete	Total Program
Product Development Organizations										
MICOM	C/CPFF	MAY 97			0	718	725	1849	CONT	CONT
Redstone Arsenal, AL										
Support and Management Organizations										
MCSC, Quantico VA	WR	OCT96			0	91	92	192	CONT	CONT
Test and Evaluation Organizations										

	Total Prior to FY 1997	FY 1997	FY 1998	FY 1999	Budget to Complete	Total Program
Subtotal Product Development	0	718	725	1849	CONT	CONT
Subtotal Support and Management	0	91	92	192	CONT	CONT
Subtotal Test and Evaluation	0	0	0	0	0	0
Total Project	0	809	817	2041	CONT	CONT

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

DATE **September 1997**

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206313M Marine Corps Communications Systems

PROJECT
C2315

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
C2315 Training Devices/Simulators	3241	8522	10108	10399	10313	6670	5283	Continuing	Continuing
Quantity of RDT&E Articles									

A. (U) <u>Mission Description and Budget Item Justification:</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.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

(U) FY 1997 Accomplishments:

- (U) $ 1,206 MTWS: Upgraded resident software to achieve improved tactical simulation, man-machine interface; scenario generation, and tactical planning capabilities.
- (U) $ 1,073 MTWS: Achieved an intermediate level of Distributed Interactive Exercise Capabilities and Joint/Combined simulations interoperability and explored telecommunications options.
- (U) $ 962 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.

(U)Total $ 3,241

(U) FY 1998 Planned Program:

- (U) $ 6,594 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.
- (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..
- (U) $ 170 JSIMS: Provide Marine Corps funding to CECOM office to provide for an USMC annex to the JSIMS Test and Evaluation Master Plan.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE September 1997
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0206313M Marine Corps Communications Systems	PROJECT C2315

- (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..
- (U) $ 300 RIS: Define After Action Report (AAR) software capabilities.

(U)Total $ 8,522

(U) FY 1999 Planned Program:

- (U) $ 7323 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..
- (U) $ 940 JSIMS: Continue Marine Corps funding to CECOM office to provide for the development of the USMC input into the Joint Conceptional Model of the Mission Space..
- (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..
- (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.
- (U) $ 750 RIS: Continue /complete AAR development and begin development of interface with C4I systems and exhisting US Army instrumented ranges. Develop integration of vitual and constructive simulations with other functional (air, surface, and ground) instrumentation capabilities.

(U)Total $ 10,108

B. (U) Project Change Summary

	FY 1997	FY 1998	FY 1999
(U) Previous President's Budget	3,285	10,772	11,151
(U) Adjustments to Previous President's Budget	-44	-2,250	-1043
(U) Current Budget Submit	3,241	8,522	10,108

(U) Change Summary Explanation:

(U) Funding: FY 1997 reduction reserved for Small Business Innovation Research assessment in accordance with 15 U.S.C. 638 (f) (1). FY 1998 and FY 1999 adjustments reflect the withdrawal of funds for Team Target Engagement Simulator (TTES) and the realignment of Training Device development funding to other higher priority Marine Corps development efforts in addition to an increase of $15 for NWCF surcharge.

(U) Schedule: N/A

(U) Technical: N/A

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

DATE **September 1997**

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206313M Marine Corps Communications Systems

PROJECT
C2315

C. (U) Other Program Funding Summary

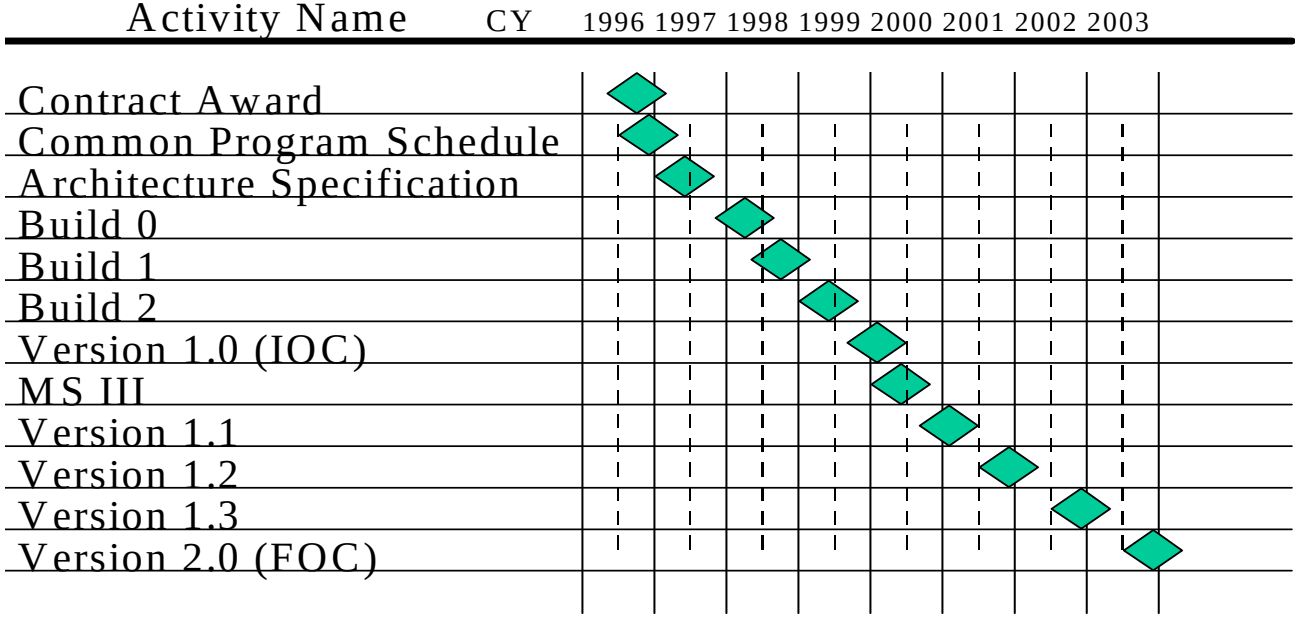
(APPN, BLI #, NOMEN)	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	To Compl	Total Cost
(U) PMC, 653200, Training Devices/Simulators	47,767	5,936	3,367	23,071	19,124	39,058	48,400	CONT	CONT

(U) Related RDT&E: PE 0603832D, Joint Simulation Management

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE September 1997
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0206313M Marine Corps Communications Systems	PROJECT C2315

D. (U) Schedule Profile

JSIMS Major Milestones



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

DATE September 1997

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206313M Marine Corps Communications Systems

PROJECT
C2315

A. (U) **Project Cost Breakdown**

	FY1997	FY1998	FY1999
Subtotal Product Development	2508	5089	5818
Subtotal Support and Management	733	3422	3640
Subtotal Test and Evaluation		0	650
Total Project	3241	8522	10108

B. Budget Acquisition History and Planning Information

Performing Organizations

Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1997	FY 1997	FY 1998	FY 1999	Budget to Complete	Total Program
Product Development Organizations										
VISICOM, Labs, Inc. San Diego, CA	RCP	NOV 96	N/A	N/A	N/A	2508	5089	5818	CONT	CONT
Support and Management Organizations										
NRaD, San Diego, CA	WR	DEC 96	N/A	N/A	N/A	454	1386	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	110	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	309	759	CONT	CONT
Naval Air Warfare Center Orlando Fl	RCP	NOV 97	N/A	N/A	N/A	0	430	445	CONT	CONT

										DATE September 1997
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0206313M Marine Corps Communications Systems					
Test and Evaluation										
MCOTEA Quantico, Va	RCP	NOV 97	N/A	N/A	N/A	0	0	650	CONT	CONT
Government Furnished Property										
Item Description	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
Product Development Property										
		N/A	N/A		N/A	0	0	0	CONT	CONT
Support and Management Property										
		N/A	N/A		N/A	0	0	0	CONT	CONT
Test and Evaluation Property										
		N/A	N/A		N/A	0	0	0	CONT	CONT
					Total Prior to FY 1997	FY 1997	FY 1998	FY 1999	Budget to Complete	Total Program
Subtotal Product Development						2508	5089	5818	CONT	CONT
Subtotal Support and Management						733	3433	3640	CONT	CONT
Subtotal Test and Evaluation						0	0	650	CONT	CONT
Total Project						3241	8522	10108	CONT	CONT

C. Funding Profile: Not Applicable

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

DATE **September 1997**

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206313M Marine Corps Communications Systems

PROJECT
C2317

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	1375	1423	1473	1525	1582	Continuing	Continuing
Quantity of RDT&E Articles									

A. (U) Mission Description and Budget Item Justification: 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).

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

(U) FY 1997 Accomplishments: This program is contained in P.E. 0206623M

(U) FY 1998 Planned Program: This program is contained in P.E. 0206623M

(U) FY 1999 Planned Program:

- (U) $ 75 Support and management to monitor and participate in the developments of the Joint Program.
- (U) $ 1300 Direct support of ASCIET to conduct yearly combat identification evaluations.

(U)Total $ 1375

B. (U) Project Change Summary

	FY 1997	FY 1998	FY 1999
(U) Previous President's Budget	0	0	0
(U) Adjustments to Previous President's Budget	0	0	1375
(U) Current Budget Submit	0	0	1375

(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.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE September 1997
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0206313M Marine Corps Communications Systems	PROJECT C2317

(U) Schedule: N/A

(U) Technical: N/A

C. (U) Other Program Funding Summary (APPN, BLI #, NOMEN)

	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	To Compl	Total Cost
(U) N/A									

(U) Related RDT&E
(U) PE 0604817A
(U) PE 0604719M, Marine Corps Command/Control/Communications Systems.

D. (U) Schedule Profile: Not Applicable.

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

DATE **September 1997**

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206623M Marine Corps Ground Combat/Supporting Arms 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	9589	12386	14954	14093	14128	12556	12479	Continuing	Continuing
C0021 Assault Amphibios Vehicle 7A1 (AAV7A1)	2104	367	278	404	416	367	378	Continuing	Continuing
C1555 Light Armored Vehicle (LAV) PIP	1403	1875	1655	2745	4486	4591	4702	Continuing	Continuing
C1901 Marine Corps Ground Weaponry PIP	1440	4568	7794	5335	3445	2053	2116	Continuing	Continuing
C2086 Marine Enhancement Program	1781	2594	3227	3551	3663	3366	3036	Continuing	Continuing
C2237 Amphibious Vehicle Test Branch	1648	1644	2000	2058	2118	2179	2247	Continuing	Continuing
C2317 All Services Combat Identification Evaluation Team (ASCIET)*	1213	1338	0	0	0	0	0	0	2551
Quantity of RDT&E Articles									

* Funding in FY 1999 and beyond is contained in PE 0206313M Marine Corps Communications Systems, Project C2317 ASCIET.

(U) Mission Description and Budget Item Justification: This PE provides modification to Marine Corps Expeditionary Ground Force Weapon Systems to increase lethality, range, survivability, and operational effectiveness. It also provides for the development of AAV7A1 reliability and safety modifications, improvements in command and control in the ADMS, product improvements to the family of LAVs, and the development effort for the LAV-AD variant. The AVTB provides facilities and personnel which perform a broad range of testing, repair and technical services to amphibious vehicles.

(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.

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

DATE **September 1997**

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206623M Marine Corps Ground Combat/Supporting Arms Systems

PROJECT
C0021

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
C0021 Assault Amphibios Vehicle 7A1 (AAV7A1)	2104	367	278	404	416	367	378	Continuing	Continuing
Quantity of RDT&E Articles									

A. (U) <u>Mission Description and Budget Item Justification:</u>

(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 (SINCGARS) 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).

(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) $ 367 Continue providing engineering support for reliability and safety related improvements and modifications, and RAM program.

(U)Total $ 367

(U) FY 1999 Planned Program:

- (U) $ 278 Continue providing engineering support for reliability and safety related improvements and modifications.

(U)Total $ 278

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

DATE **September 1997**

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206623M Marine Corps Ground Combat/Supporting Arms Systems

PROJECT
C0021

B. (U) Project Change Summary

	FY 1997	FY 1998	FY 1999
(U) Previous President's Budget	922	249	277
(U) Adjustments to Previous President's Budget	1182	118	1
(U) Current Budget Submit	2,104	367	278

(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 $118 in FY 98 is for DT related to the RAM program. FY 99 reflects an increase of $1 for NWCF surcharge.

(U) Schedule: N/A

(U) Technical: N/A

C. (U) Other Program Funding Summary

(APPN, BLI #, NOMEN)	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	To Complete	Total Cost
(U) PMC, 202100, AAV PIP	12030	13,520	91622	81736	83587	75121	2587	Cont.	Cont.
(U) PMC, 206300, Modification Kits (Track Veh)	480	4,483	5,833	21,118	16,683	19,540	2,078	Cont.	Cont.

(U) Related RDT&E: PE 0603611M (Marine Corps Assault Vehicles)

D. (U) Schedule Profile: N/A

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

DATE September 1997

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206623M Marine Corps Ground Combat/Supporting Arms Systems

PROJECT
C0021

A. (U) Project Cost Breakdown

	FY 1997	FY 1998	FY 1999
ECP Support	130	0	0
Product Development	1,338	167	11
Contractor Engineering Support	593	140	252
Government Engineering Support	14	0	0
Program Management Support	15	60	15
Misc	14	0	0
Total	2104	367	278

B. Budget Acquisition History and Planning Information

Performing Organizations

Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1997	FY 1997	FY 1998	FY 1999	Budget to Complete	Total Program
Product Development Organizations										
TACOM, Warren , MI	MIPR	Various	20266	20266	18,797	1,352	117	0	0	20266
MCLB, Albany, GA	WR	Various	1599	1599	1,584	15	0	0	0	1599
MISC (MCCDC, QUANTICO, VA and MCLB BARSTOW, CA)	Various	Various	N/A	N/A	2,452	130	51	10	Cont.	Cont.
Support and Management Organizations										
AERA, Dumfries, VA	CPFF	Various	1776	1776	944	440	140	252	0	1776
General Dynamics, Warren, MI	RCP	Various	20	20	0	20	0	0	0	20

AV Tech, Chesterfield, MI	RCP	Various	20	20	0	20	0	269	20	20
ISI, Philadelphia, PA	CPFF	Various	113	113	0	113	0	0	0.	113
Misc	TBD	Various	90	90	0	14	60	16	90	180

Test and Evaluation Organizations
Not Applicable

	Total Prior to FY 1997	FY 1997	FY 1998	FY 1999	Budget to Complete	Total Program
Subtotal Product Development	22833	1497	167	10	Cont.	Cont.
Subtotal Support and Management	944	607	200	268	Cont.	Cont.
Subtotal Test and Evaluation	0	0	0	0		0
Total Project	23777	2104	367	278		Cont.

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

DATE **September 1997**

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206623M Marine Corps Ground Combat/Supporting Arms Systems

PROJECT
C1555

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
C1555 Light Armored Vehicle (LAV) PIP	1403	1875	1655	2745	4486	4591	4702	Continuing	Continuing
Quantity of RDT&E Articles									

A. (U) <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) $ 1025 Continue Study and Development of the Light Armored Combat System/LAV PIP/SLEP.
- (U) $ 450 Continue Evaluation of Current LAV Safety/Survivability, Maintainability, and Readiness Enhancements.
- (U) $ 400 Continue Evaluation of Current LAV Performance Capabilities Improvements.

(U)Total $ 1,875

(U) FY 1999 Planned Program:

- (U) $ 985 Continue Study and Development of the Light Armored Combat System/LAV PIP/SLEP.
- (U) $ 350 Continue Evaluation of Current LAV Safety/Survivability, Maintainability, and Readiness Enhancements.
- (U) $ 320 Continue Evaluation of Current LAV Performance Capabilities Improvements.

(U)Total $ 1,655

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

DATE **September 1997**

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206623M Marine Corps Ground Combat/Supporting Arms Systems

PROJECT
C1555

B. (U) Project Change Summary

	FY 1997	FY 1998	FY 1999
(U) Previous President's Budget	1357	1875	1920
(U) Adjustments to Previous President's Budget	46	0	-265
(U) Current Budget Submit	1403	1875	1655

(U) Change Summary Explanation:

(U) Funding: FY 1997 adjustments reflect reprogramming. FY 1999 reduction reflects downsizing of LAV-Test Directorate at Yuma, AZ.

(U) Schedule: Not Applicable.

(U) Technical: Not Applicable.

C. (U) Other Program Funding Summary (APPN, BLI #, NOMEN)

	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	To Complete	Total Cost
(U) PMC, 203800, LAV PIP	15959	600	1410	1704	1321	1662	10337	Continue	Continue
(U) PMC, 203900, LAV (LAV AIR DEFENSE)	0	6727	0	0	0	0	0	0	81338

(U) Related RDT&E

D. (U) Schedule Profile: Not applicable

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

DATE September 1997

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206623M Marine Corps Ground Combat/Supporting Arms Systems

PROJECT
C1555

A. (U) Project Cost Breakdown

	FY 1997	FY 1998	FY 1999
Product Development	558	890	945
Support Costs and Management	679	687	454
Test and Evaluation	166	298	256
Total	1403	1875	1655

B. Budget Acquisition History and Planning Information

Performing Organizations

Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1997	FY 1997	FY 1998	FY 1999	Budget to Complete	Total Program
Product Development Organizations										
Delco Electronics	FFP	Apr 97	N/A	N/A	0	25	250	250	Continue	Continue
Dies Div, GM	C/FF	June 97	N/A	N/A	0	50	250	300	Continue	Continue
Hupp Ind	FFP	May 97	35	35	15	20	0	0	35	35
Other	Various	Various	N/A	N/A	9119	463	390	395	Continue	Continue
Support and Management Organizations										
In-house Support	WR	1st Qtr	N/A	N/A	22043	679	687	454	Continue	Continue
Test and Evaluation Organizations										
Other (LAV Test Dir/YumaPrvGrd)	WR	Various	N/A	N/A	4171	166	298	256	Continue	Continue

Government Furnished Property

Item Description	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
Product Development Property									
Not Applicable									
Support and Management Property									

	DATE
	September 1997

BUDGET ACTIVITY	PE NUMBER AND TITLE
7 - Operational System Development	**0206623M Marine Corps Ground Combat/Supporting Arms Systems**

Not Applicable

Test and Evaluation Property

Not Applicable

	Total Prior to FY 1997	FY 1997	FY 1998	FY 1999	Budget to Complete	Total Program
Subtotal Product Development	9134	558	890	945	Continue	Continue
Subtotal Support and Management	22043	679	687	454	Continue	Continue
Subtotal Test and Evaluation	4171	166	298	256	Continue	Continue
Total Project	35348	1403	1875	1655	Continue	Continue

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

DATE **September 1997**

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206623M Marine Corps Ground Combat/Supporting Arms Systems

PROJECT
C1901

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
C1901 Marine Corps Ground Weaponry PIP	1440	4568	7794	5335	3445	2053	2116	Continuing	Continuing
Quantity of RDT&E Articles									

A. (U) Mission Description and Budget Item Justification: 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.

(U) FY 1997 Accomplishments:

- (U) $ 630 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.
- (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.
- (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.
- (U) $ 84 Small Craft: Fault analysis for future modifications to Marine Corps riverine assault craft.

(U)Total $ 1,440

(U) FY 1998 Planned Program:

- (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) $ 246 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.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE September 1997
BUDGET ACTIVITY **7 - Operational System Development**	PE NUMBER AND TITLE **0206623M Marine Corps Ground Combat/Supporting Arms Systems**	PROJECT **C1901**

- (U) $ 2,114 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 alternatives/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) $ 711 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.
- (U) $ 915 Infantry Mods: Continue 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. Complete developmental/operational testing for the Infra red Laser Pointer (ILP).
- (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)Total $ 4,568

(U) FY 1999 Planned Program:

- (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.
- (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
- (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.
- (U) $ 1,585 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.
- (U) $ 1,206 Infantry Mods: Continue 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 weapon 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.

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

DATE September 1997

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206623M Marine Corps Ground Combat/Supporting Arms Systems

PROJECT
C1901

- (U) $ 60 Gun Laying Positioning System (GLPS). Continue Marine Corps unique life cycle cost estimates and logistic support documentation.
- (U) $ 50 Meteorological Hydrogen Generator (MHG). Continue Marine Corps unique life cycle cost estimates and logistic support documentation.
- (U) $ 613 Thermal Weapons Sight (TWS): Conduct operational testing and evaluation of TWS.

(U)Total $ 7,794

B. (U) Project Change Summary

	FY 1997	FY 1998	FY 1999
(U) Previous President's Budget	1506	4568	7787
(U) Adjustments to Previous President's Budget	-66	0	7
(U) Current Budget Submit	1440	4568	7794

(U) Change Summary Explanation:

(U) Funding: Decrease of $66K in FY 1997 due to minor program changes and increase of $7k in FY 1999 is due to rate adjustment.

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

C. (U) Other Program Funding Summary (APPN, BLI #, NOMEN)

	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	To Complete	Total Cost
(U) PMC (BLI#206300) Modifications Kits (Trk Veh)	480	4483	5833	21118	16683	19540	2078	Cont.	Cont.
(U) PMC (BLI#220900) Modifications Kits (Arty & Other)	1112	1547	1843	1697	1431	1175	1215	Cont.	Cont.
(U) PMC (BLI#493000) Near Infrared FAC Pointer (ILP)	0	0	837	0	0	0	0	0	837
(U) PMC (BLI#473300) Mortar Ballistic Device (MBD)	0	0	0	0	3066	3000	0	0	6066
(U) PMC (BLI#473300) Target Hand-off Locator Designator and Hand-off System (THLDS)	0	0	0	4381	12108	18829	19795	Cont.	Cont.
(U) PMC (BLI#493000) Thermal Weapon Sight (TWS)	0	0	0	27734	28581	29460	25761	Cont.	Cont.

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

DATE **September 1997**

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206623M Marine Corps Ground Combat/Supporting Arms Systems

PROJECT
C1901

C. (U) Other Program Funding Summary (APPN, BLI #, NOMEN)	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	To Complete	Total Cost
(U) PMC (BLI#219700) Meteorological Hydrogen Generator	0	0	0	0	3069	0	0	0	3069
(U) PMC (BLI#219800) Gun Laying Positioning System (GLIPS)	0	0	0	0	13132	13708	0	0	26840

(U) Related RDT&E:

(U) All Ground Weapons and Ground Ammunition Systems: Army, Navy, Air Force, Coast Guard, and Commander Special Operations Command.

D. (U) Schedule Profile: See attached.

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

DATE **September 1997**

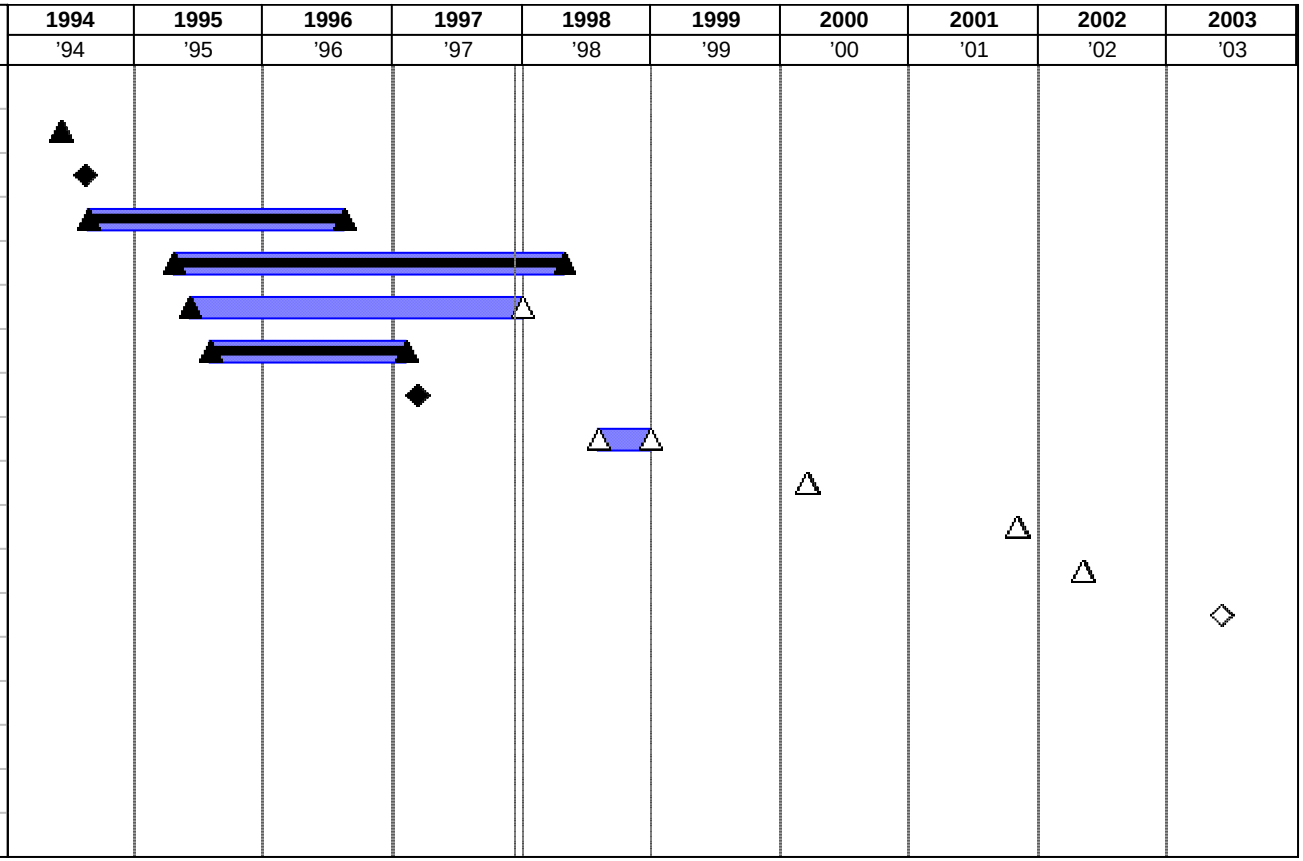
BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206623M Marine Corps Ground Combat/Supporting Arms Systems

PROJECT
C1901

GLPS

ID	Task Name
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	FOC
14	
15	
16	
17	
18	



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

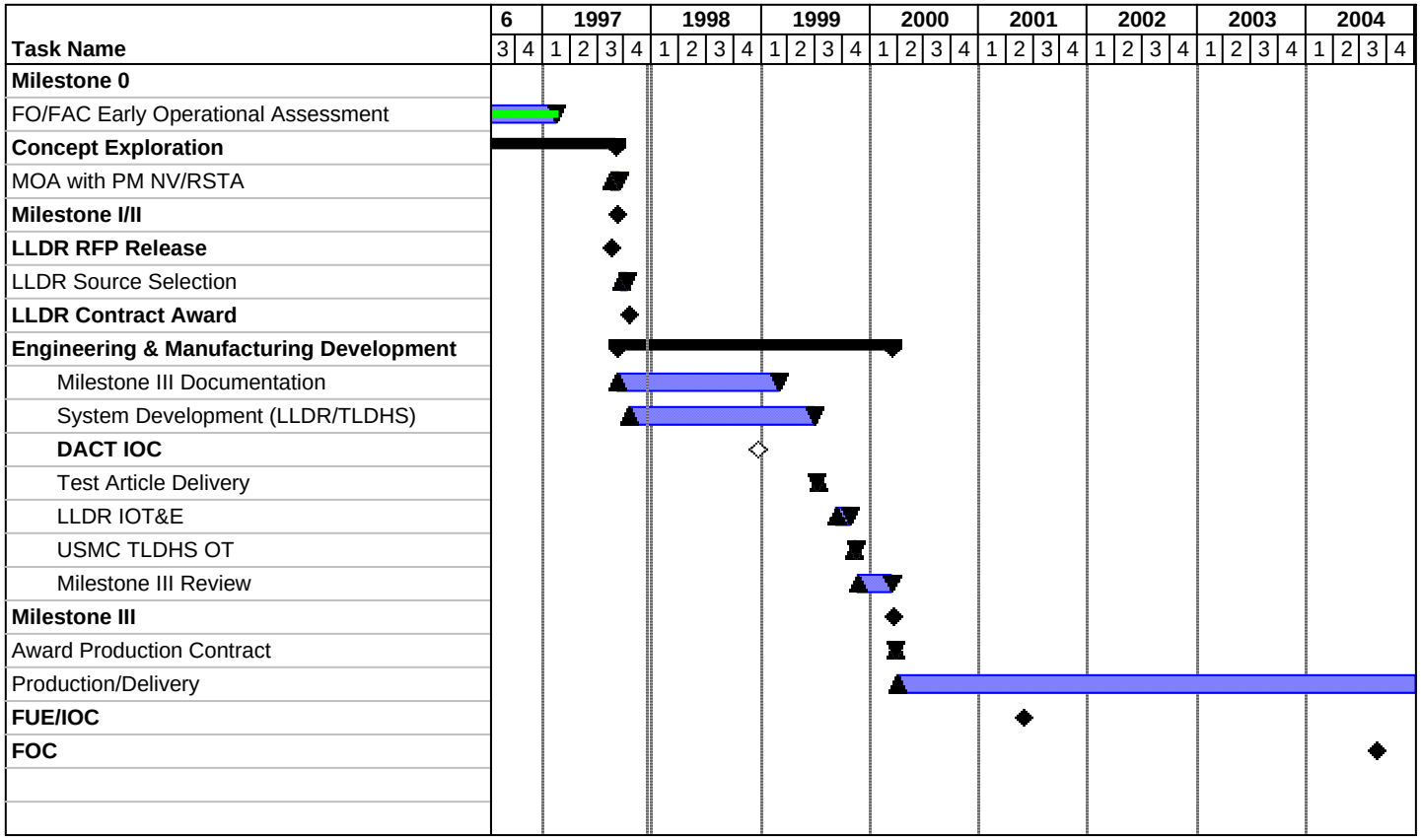
DATE **September 1997**

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206623M Marine Corps Ground Combat/Supporting Arms Systems

PROJECT
C1901

TLDHS



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

DATE **September 1997**

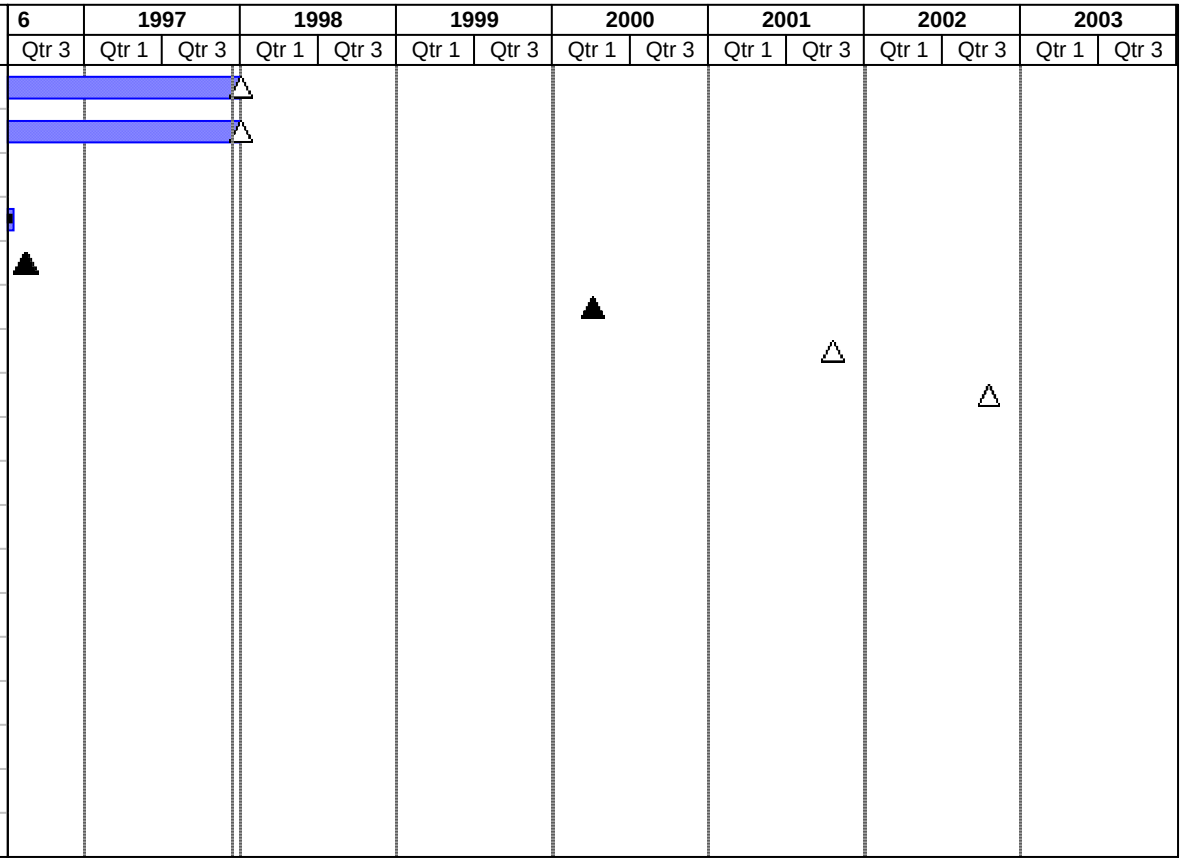
BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206623M Marine Corps Ground Combat/Supporting Arms Systems

PROJECT
C1901

MHG

ID	Task Name
1	ORD
2	Joint MOA
3	Milestone 0
4	IOT&E
5	RAA in Lieu of COEA
6	MCPDM
7	IOC
8	FOC
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	



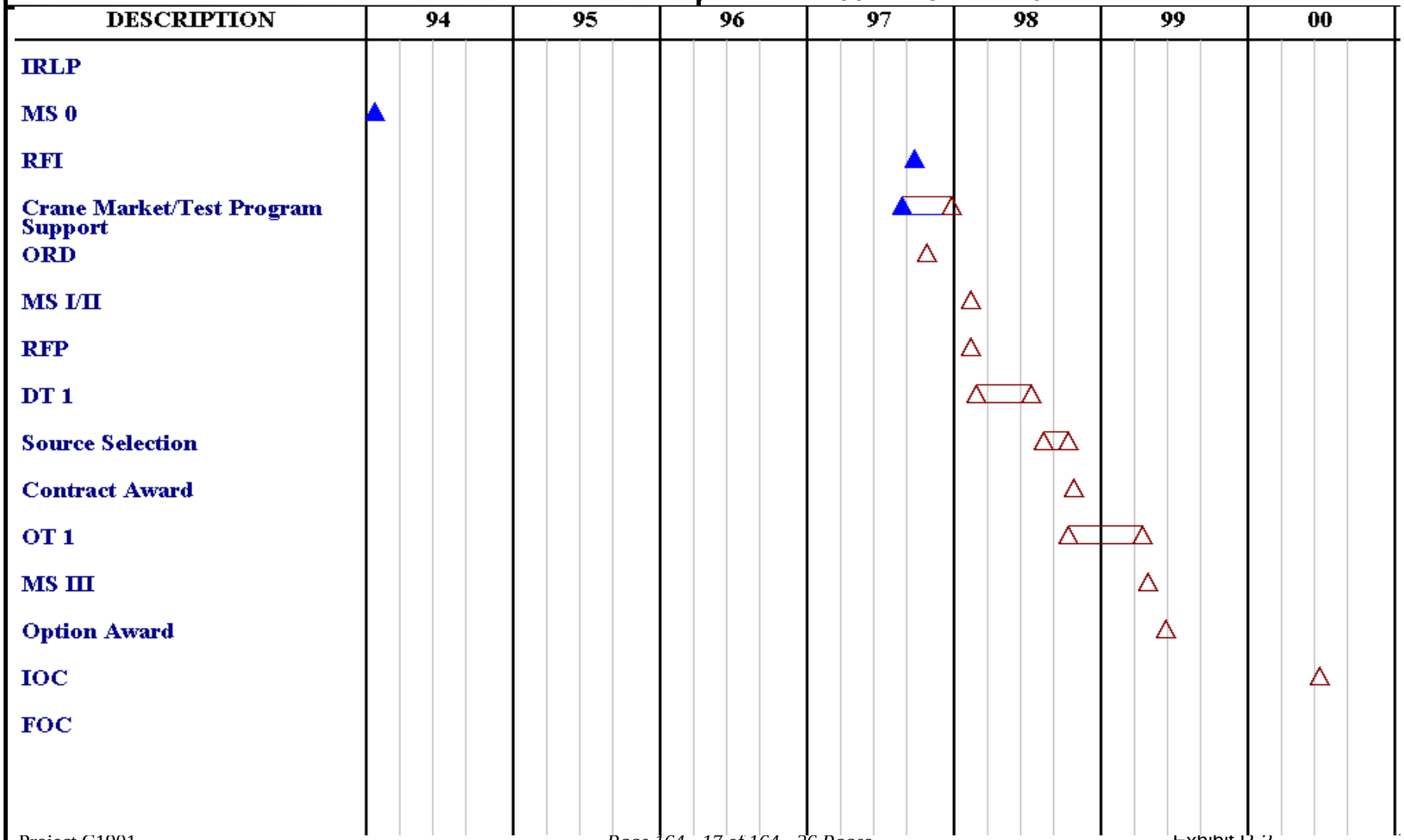
RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)

DATE
September 1997

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206623M Marine Corps Ground Combat/Supporting Arms Systems

PROJECT
C1901



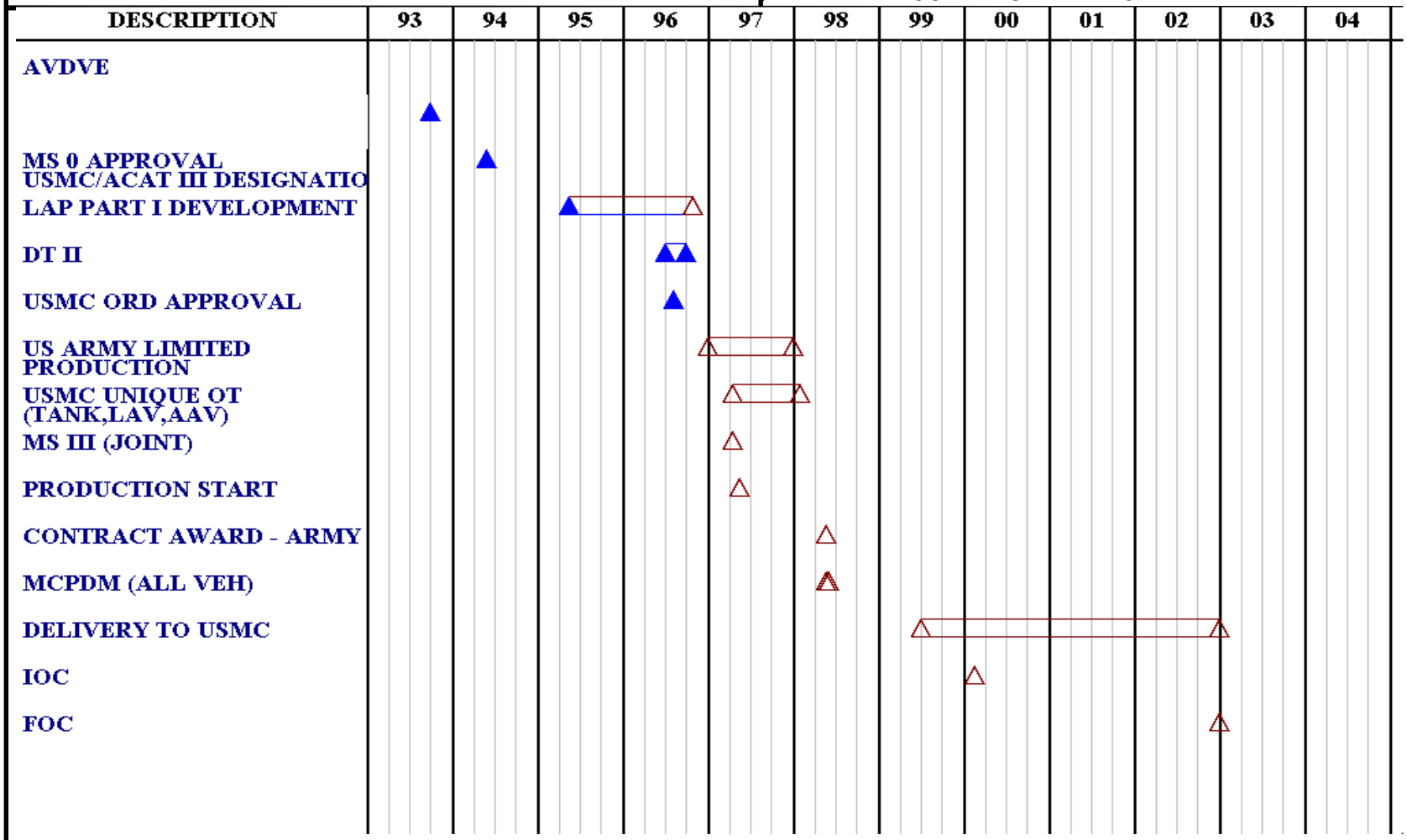
RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)

DATE
September 1997

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206623M Marine Corps Ground Combat/Supporting Arms Systems

PROJECT
C1901



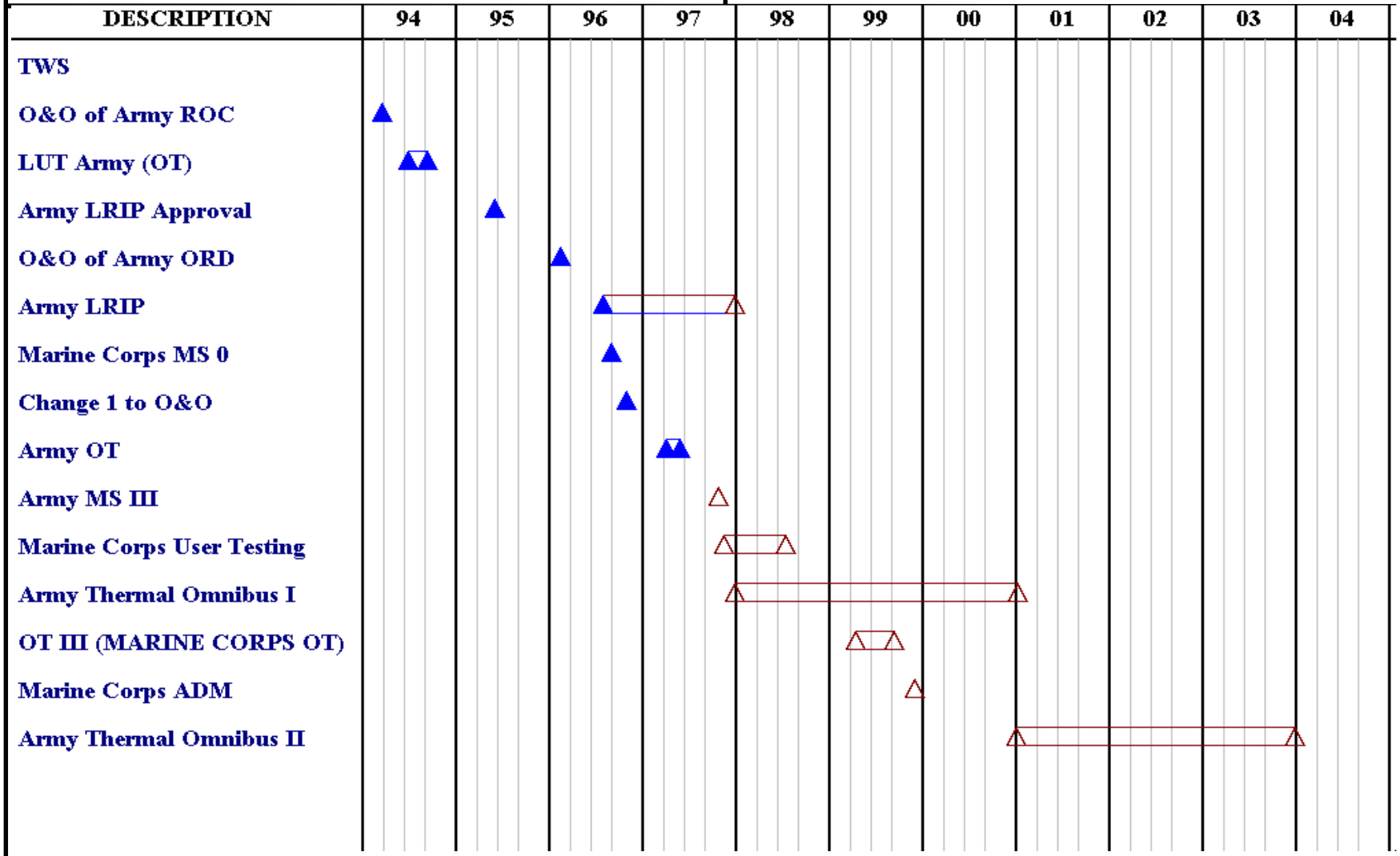
RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)

DATE
September 1997

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206623M Marine Corps Ground Combat/Supporting Arms Systems

PROJECT
C1901



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

DATE **September 1997**

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206623M Marine Corps Ground Combat/Supporting Arms Systems

PROJECT
C2086

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
C2086 Marine Enhancement Program	1781	2594	3227	3551	3663	3366	3036	Continuing	Continuing
Quantity of RDT&E Articles									

A. (U) Mission Description and Budget Item Justification: 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.

(U) FY 1997 Accomplishments:

- (U) $ 561 Explored NDI equipment that will improve the combat effectiveness and enhance safety and survivability of the Individual Marine.
- (U) $ 1004 Explored clothing and individual equipment NDI categories.
- (U) $ 216 Explored ground weapons, communications and command and control equipment NDI categories.

(U)Total $ 1,781

(U) FY 1998 Planned Program:

- (U) $ 620 Continue to explore NDI equipment that will improve the combat effectiveness and enhance safety and survivability of the Individual Marine.
- (U) $ 510 Continue to explore clothing and individual equipment NDI categories.
- (U) $ 491 Continue to explore ground weapons, communications and command and control equipment NDI categories.
- (U) $ 973 Explore initial issue clothing and individual equipment categories.

(U)Total $ 2,594

(U) FY 1999 Planned Program:

- (U) $ 691 Continue to explore NDI equipment that will improve the combat effectiveness and enhance safety and survivability of the Individual Marine.
- (U) $ 716 Continue to explore clothing and individual equipment NDI categories.
- (U) $ 807 Continue to explore ground weapons, communications and command and control equipment NDI categories.
- (U) $ 1013 Explore initial issue clothing and individual equipment categories.

(U)Total $ 3,227

	DATE
	September 1997

BUDGET ACTIVITY	PE NUMBER AND TITLE
7 - Operational System Development	0206623M Marine Corps Ground Combat/Supporting Arms Systems

B. (U) Project Change Summary

	FY 1997	FY 1998	FY 1999
(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: NA

(U) Technical: NA

C. (U) Other Program Funding Summary (APPN, BLI #, NOMEN)

	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	To Complete	Total Cost
(U) PMC (BLI # 221100) 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) Related RDT&E: PE 0604713A (Combat Feeding, Clothing and Equipment)

D. (U) Schedule Profile: NA

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

DATE **September 1997**

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206623M Marine Corps Ground Combat/Supporting Arms Systems

PROJECT
C2237

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
C2237 Amphibious Vehicle Test Branch	1648	1644	2000	2058	2118	2179	2247	Continuing	Continuing
Quantity of RDT&E Articles									

A. (U) Mission Description and Budget Item Justification:

(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.

(U) FY 1997 Accomplishments:

- (U) $ 355 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.
- (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.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE September 1997
BUDGET ACTIVITY **7 - Operational System Development**	PE NUMBER AND TITLE **0206623M Marine Corps Ground Combat/Supporting Arms Systems**	PROJECT **C2237**

- (U) $ 1,093 Provided AVTB personnel civilian salaries to support scheduled AAV7A1 and AAAV 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 technical analysis of proposed product improvements as requested. 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.

(U)Total $ 1,648

(U) FY 1998 Planned Program:

- (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.
- (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.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE September 1997
BUDGET ACTIVITY **7 - Operational System Development**	PE NUMBER AND TITLE **0206623M Marine Corps Ground Combat/Supporting Arms Systems**	PROJECT **C2237**

- (U) $ 1251 Provide AVTB personnel civilian salaries to support scheduled AAV7A1 and AAAV 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.

(U)Total $ 1,644

(U) FY 1999 Planned Program:

- (U) $ 508 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.
- (U) $ 291 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.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE September 1997
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0206623M Marine Corps Ground Combat/Supporting Arms Systems	PROJECT C2237

- (U) $ 1,201 Provide AVTB personnel civilian salaries to support scheduled AAV7A1 and AAAV 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.

(U)Total $ 2,000

B. (U) Project Change Summary

	FY 1997	FY 1998	FY 1999
(U) Previous President's Budget	1648	1,944	1,992
(U) Adjustments to Previous President's Budget	0	-300	8
(U) Current Budget Submit	1,648	1644	2000

(U) Change Summary Explanation: FY 1998 internal budget adjustment finances higher priority Marine Corps program.

C. (U) Other Program Funding Summary (APPN, BLI #, NOMEN)

	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	To Complete	Total Cost
(U) Not Applicable									

	DATE **September 1997**
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.

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

DATE **September 1997**

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206624M Marine Corps Combat Services Support

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	7993	5048	4748	11222	7841	8202	1136	Continuing	Continuing
C0076 Medium Tactical Vehicle Replacement (MTVR)	6384	3986	2003	8559	1354	1388	0	0	44788
C0200 Light Tactical Vehicle Replacement (LTVR)	530	200	0	0	0	0	0	0	730
C0201 Logistical Vehicle System Replacement (LVSR)	0	0	926	1053	5648	6693	1011	0	15331
C2316 Combat Service Support Engineering Equipment	1079	862	1819	1610	839	121	125	Continuing	Continuing
Quantity of RDT&E Articles									

(U) Mission Description and Budget Item Justification: 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.

(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.

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

DATE **September 1997**

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206624M Marine Corps Combat Services Support

PROJECT
C0076

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	3986	2003	8559	1354	1388	0	0	44788
Quantity of RDT&E Articles	10			8					

A. (U) Mission Description and Budget Item Justification: 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.

(U) FY 1997 Accomplishments:

- (U) $ 5399 Award EMD contracts for prototype truck fabrications and initiate Developmental Testing (DT) on 10 EMD vehicles.
- (U) $ 802 Provide program documentation and management support of the MTVR program.
- (U) $ 79 Continue to provide travel in support of the MTVR program.
- (U) $ 54 Testing with the Marine Corps advanced technology transition demonstrator.
- (U) $ 50 Initiated corrosion engineering efforts for MTVR.

(U)Total $ 6,384

(U) FY 1998 Planned Program:

- (U) $ 3016 Continue testing prototype vehicles provided by contractors. Durability testing, Reliability, Availability and Maintainability (RAM) testing, etc.
- (U) $ 870 Provide program documentation and management support for the MTVR program.
- (U) $ 100 Provide travel in support of the MTVR program.

(U)Total $ 3,986

(U) FY 1999 Planned Program:

- (U) $ 2,003 Down select to one contractor via formal source selection procedures. Award LRIP quantities for all required follow-on operational testing.

(U)Total $ 2,003

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

DATE September 1997

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206624M Marine Corps Combat Services Support

PROJECT
C0076

B. (U) Project Change Summary

	FY 1997	FY 1998	FY 1999
(U) Previous President's Budget	4468	3,986	1,814
(U) Adjustments to Previous President's Budget	+1916	0	+189
(U) Current Budget Submit	6384	3,986	2,003

(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. FY 1999 decrease of $18 thousand reflects a NWCF Surcharge reduction and an increase of $207 thousand reflects refined cost estimates.

(U) Schedule: N/A

(U) Technical: N/A

C. (U) Other Program Funding Summary

(APPN, BLI #, NOMEN)	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	To Compl	Total Cost
(U) PMC Line (BLI# 508800) MTVR	0	0	85289	130638	309885	319756	397246	CONT.	CONT.

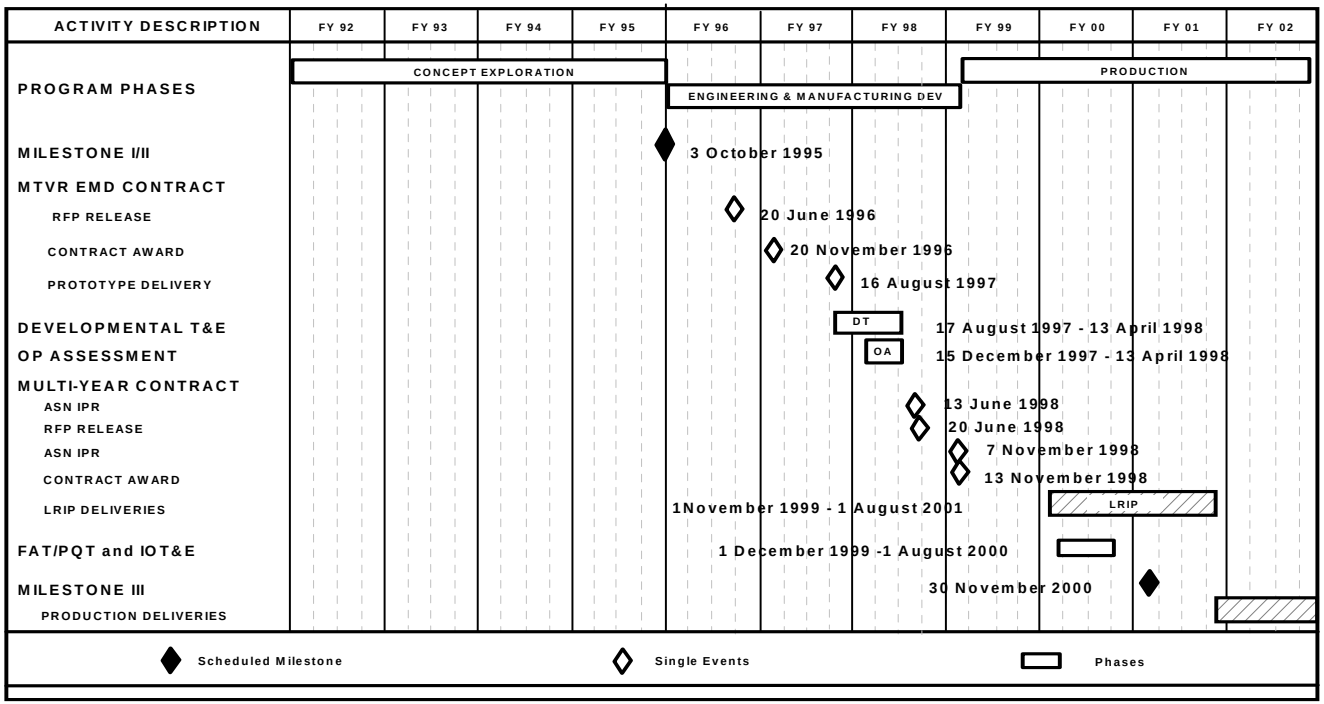
(U) Related RDT&E

(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 September 1997
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



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

DATE September 1997

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206624M Marine Corps Combat Services Support

PROJECT
C0076

A. (U) Project Cost Breakdown

	FY 1997	FY 1998	FY 1999
Product Development	5249	0	1707
Support and Management	931	970	296
Test and Evaluation	204	3016	0
Total	6384	3986	2003

B. Budget Acquisition History and Planning Information

Performing Organizations

Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1997	FY 1997	FY 1998	FY 1999	Budget to Complete	Total Program
Product Development Organizations										
TACOM	MIPR				5179	5249	0	1707	6463	18598
Support and Management Organizations										
TACOM	MIPR				1268	802	870	200	0	3140
MKI	RCP				72	0	0	0	500	572
MARCORSYSCOM	WR				60	129	100	96	200	585
Test and Evaluation Organizations										
TACOM	MIPR				2000	204	3016	0	4138	9358

Government Furnished Property

Item Description	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
Product Development Property									
N/A									
Support and Management Property									
N/A									
Test and Evaluation Property									
N/A									

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

DATE **September 1997**

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206624M Marine Corps Combat Services Support

PROJECT
C0076

	Total Prior to FY 1997	FY 1997	FY 1998	FY 1999	Budget to Complete	Total Program
Subtotal Product Development	5179	5249	0	1707	6463	18598
Subtotal Support and Management	1400	931	970	296	700	3140
Subtotal Test and Evaluation	2000	204	3016	0	4138	9358
Total Project	8579	6384	3986	2003	11301	32253

C. Funding Profile. Not Applicable

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

DATE **September 1997**

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206624M Marine Corps Combat Services Support

PROJECT
C0200

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	200	0	0	0	0	0	0	730
Quantity of RDT&E Articles									

A. (U) Mission Description and Budget Item Justification: 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.

(U) FY 1997 Accomplishments:

- (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.

(U)Total $ 530

(U) FY 1998 Planned Program:

- (U) $ 200 Provide for Army TACOM program support activities. Perform corrosion and component reliability testing. Complete Milestone I/III documentation.

(U)Total $ 200

(U) FY 1999 Planned Program:

- (U) $ 0 N/A

(U)Total $ 0

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

DATE September 1997

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206624M Marine Corps Combat Services Support

PROJECT
C0200

B. (U) Project Change Summary

	FY 1997	FY 1998	FY 1999
(U) Previous President's Budget	744	200	200
(U) Adjustments to Previous President's Budget	-249	0	-207
(U) Current Budget Submit	530	200	0

(U) Change Summary Explanation:

(U) Funding: FY 1997 change due to realignment of Marine Corps Combat Service programs and updated program cost estimates. 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

C. (U) Other Program Funding Summary

(APPN, BLI #, NOMEN)	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	To Compl	Total Cost
(U) PMC Line (BLI #508900) LTVR	0	0	0	69,348	65,581	65,021	60,855	CONT.	CONT.

(U) Related RDT&E

(U) PE 0206623M Marine Corps Ground Combat Supporting Arms Systems

D. (U) Schedule Profile: See attached

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

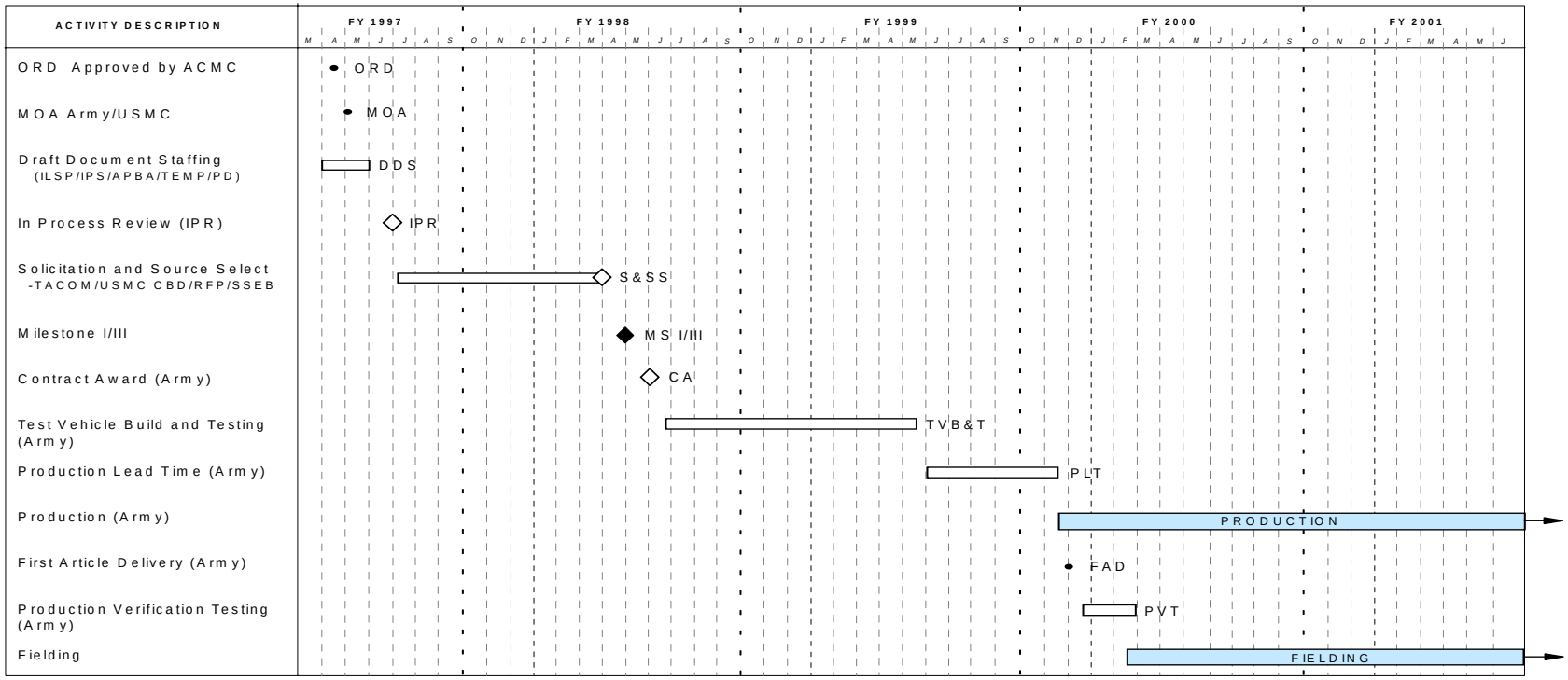
DATE **September 1997**

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206624M Marine Corps Combat Services Support

PROJECT
C0200

LIGHT TACTICAL VEHICLE REPLACEMENT
SCHEDULE



The above represents the Army's (Lead Service) LTVR Schedule. The USMC has budget funds in this PE to participate in development/testing. However, the USMC production funding does not begin until FY00.

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

DATE September 1997

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206624M Marine Corps Combat Services Support

PROJECT
C0200

A. (U) Project Cost Breakdown

	FY 1997	FY 1998	FY 1999
Support and Management	530	200	0
Total	530	200	0

B. Budget Acquisition History and Planning Information

Performing Organizations

Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1997	FY 1997	FY 1998	FY 1999	Budget to Complete	Total Program
Product Development Organizations										
N/A					0	0	0	0	0	0
Support and Management Organizations										
Miscellaneous	MIPR/RCP	Various			0	70	0	0	0	70
TACOM	WR				0	120	200	0	0	320
MKI	RCP				0	340	0	0	0	340
Test and Evaluation Organizations										
					0	0	0	0	0	0

Government Furnished Property

Item Description	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
Product Development Property									
N/A									
Support and Management Property									
N/A									
Test and Evaluation Property									
N/A									

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

DATE **September 1997**

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206624M Marine Corps Combat Services Support

PROJECT
C0200

	Total Prior to FY 1997	FY 1997	FY 1998	FY 1999	Budget to Complete	Total Program
Subtotal Product Development						
Subtotal Support and Management	0	530	200	0	0	730
Subtotal Test and Evaluation						
Total Project	0	530	200	0	0	730

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

DATE **September 1997**

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206624M Marine Corps Combat Services Support

PROJECT
C0201

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	926	1053	5648	6693	1011	0	15331
Quantity of RDT&E Articles									

A. (U) <u>Mission Description and Budget Item Justification:</u> 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) $ 926 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 $ 926

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

DATE September 1997

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206624M Marine Corps Combat Services Support

PROJECT
C0201

B. (U) Project Change Summary

	FY 1997	FY 1998	FY 1999
(U) Previous President's Budget	0	0	923
(U) Adjustments to Previous President's Budget	0	0	3
(U) Current Budget Submit	0	0	926

(U) Change Summary Explanation:

(U) Funding: FY 1999 funds reflect a NWCF surcharge increase.

(U) Schedule: N/A

(U) Technical: N/A

C. (U) Other Program Funding Summary

(APPN, BLI #, NOMEN)	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	To Compl	Total Cost
(U) PMC Line (BLI #509300) LVSR	0	0	0	0	0	0	32,936	CONT.	CONT.

(U) Related RDT&E

(U) PE 0206623M Marine Corps Ground Combat Supporting Arms Systems

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

DATE **September 1997**

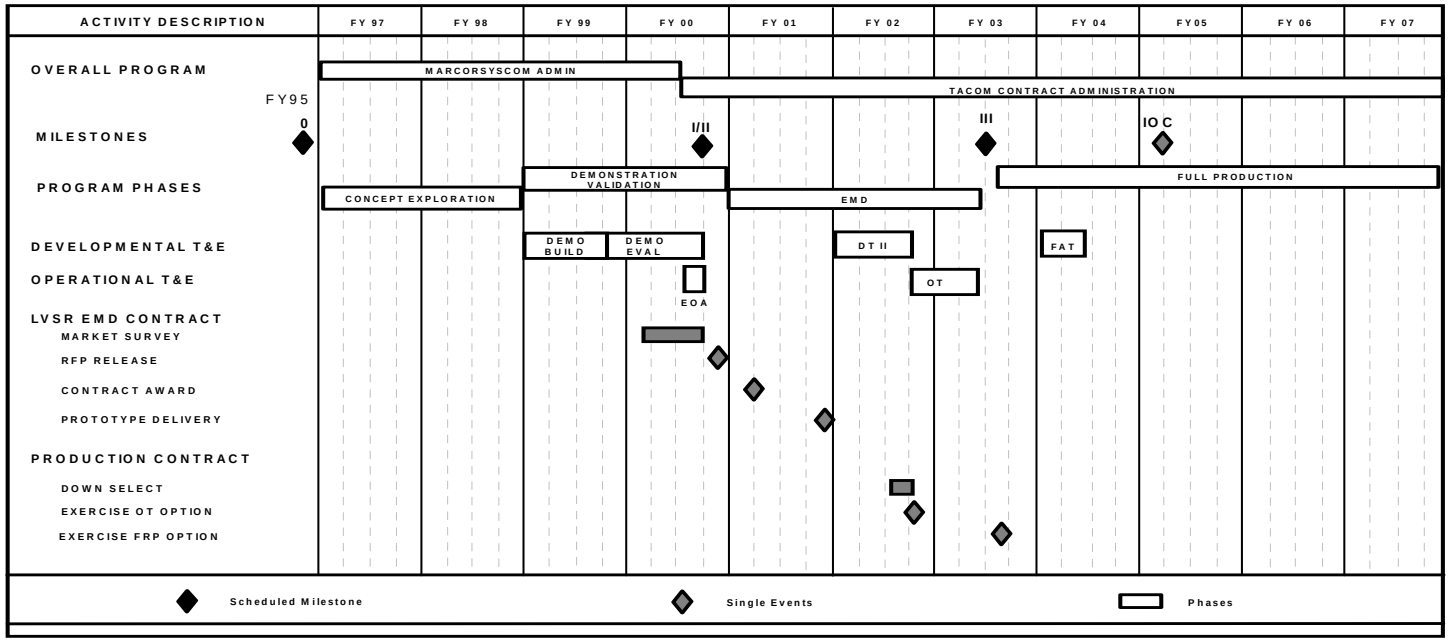
BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206624M Marine Corps Combat Services Support

PROJECT
C0201

D. (U) Schedule Profile:

LOGISTICS VEHICLE SYSTEM REPLACEMENT PROGRAM
Schedule



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

DATE **September 1997**

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206624M Marine Corps Combat Services Support

PROJECT
C2316

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	862	1819	1610	839	121	125	Continuing	Continuing
Quantity of RDT&E Articles									

A. (U) Mission Description and Budget Item Justification: 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.

(U) FY 1997 Accomplishments:

- (U) $ 18 CBV - Conduct a shipboard compatibility study.
- (U) $ 350 CPAC - Initiated corrosion engineering efforts for pre-milestone III programs, including AAA and others.
- (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.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE September 1997
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0206624M Marine Corps Combat Services Support	PROJECT C2316

(U)Total $ 1,079

(U) FY 1998 Planned Program:

- (U) $ 451 1500ROWPU: Design and fabrication of a working 1500ROWPU prototype to confirm the design decisions based on componentry testing.
- (U) $ 116 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.
- (U) $ 295 TWIN AGENT UNIT, MOBILE: Complete combined DT and OT&E.

(U)Total $ 862

(U) FY 1999 Planned Program:

- (U) $ 947 CBV: Evaluation and testing of CBV/minefield marking capabilities/amphibious shipboard compatibility.
- (U) $ 754 1500ROWPU: Test and evaluation of the 1500ROWPU prototype to include required changes to componentry to optimize the design hardware.
- (U) $ 118 TETS: Develop new technology testing applications in support of emerging weapon systems.

(U)Total $ 1,819

B. (U) Project Change Summary

	FY 1997	FY 1998	FY 1999
(U) Previous President's Budget	469	862	1820
(U) Adjustments to Previous President's Budget	610	0	-1
(U) Current Budget Submit	1079	862	1819

(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 funds reflect a NWCF - Marine Corps Depot Rate Adjustment.

(U) Schedule: TETS underwent DOD IG Audit. Contract Award subsequently delayed to 4th QTR FY 97, Field Qualification Test (FQT) delayed to 2nd QTR FY 98.

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

DATE September 1997

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206624M Marine Corps Combat Services Support

PROJECT
C2316

(U) Technical: N/A

C. (U) Other Program Funding Summary (APPN, BLI #, NOMEN)

	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	To Compl	Total Cost
(U) PMC Line (BLI# 613300) CBV	0	0	0	0	0	56,097	72,427	Cont	Cont
(U) PMC LINE (BLI# 627400) 1500ROWPU	0	0	0	0	34,241	26,445	25,575	Cont	Cont
(U) PMC LINE (BLI# 666900) TAU	0	0	1,144	0	0	0	0	0	1,144
(U) PMC Line 33 (BLI# 440200) TETS	12,153	12,121	19,674	29,868	0	0	0	0	73,816

(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

D. (U) Schedule Profile: N/A

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

DATE September 1997

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206624M Marine Corps Combat Services Support

PROJECT
C2316

A. (U) Project Cost Breakdown

	FY 1997	FY 1998	FY 1999
Production Development	201	557	1804
Support and Management	368	55	15
Test and Evaluation	510	250	0
Total	1079	862	1819

B. Budget Acquisition History and Planning Information

Performing Organizations

Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1997	FY 1997	FY 1998	FY 1999	Budget to Complete	Total Program
Product Development Organizations										
Miscellaneous	Various	Various			0	201	116	1065	CONT	CONT
TACOM	MIPR				0	0	441	739	CONT	CONT
Support and Management Organizations										
MKI	RCP				0	18	0	0	0	18
MARCORSYSCOM	WR				0	350	0	0	0	350
Miscellaneous	Various	Various			0	0	55	15	CONT	CONT
Test and Evaluation Organizations										
Miscellaneous	Various	Various			0	510	0	0	0	510
TBD	RCP				0	0	250	0	0	250

Government Furnished Property

Item Description	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
Product Development Property									
N/A									
Support and Management Property									
N/A									
Test and Evaluation Property									
N/A									

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

DATE **September 1997**

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0206624M Marine Corps Combat Services Support

PROJECT
C2316

	Total Prior to FY 1997	FY 1997	FY 1998	FY 1999	Budget to Complete	Total Program
Subtotal Product Development		201	567	1804	CONT	CONT
Subtotal Support and Management		368	55	15	CONT	CONT
Subtotal Test and Evaluation		510	250	0	760	760
Total Project		1079	862	1819	CONT	CONT

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

BUDGET ACTIVITY: 7
PROGRAM ELEMENT: 0207161N
PROGRAM ELEMENT TITLE: TACTICAL AIR INTERCEPT

(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
E0457 AIM-9X	45,321	60,079	66,877	43,440	21,072	9,534	5,733	0	280,159
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) ($9,445) Monitored EMD contract and began government Developmental Test (DT)-IIA.

• (U) ($1,500) Provided headquarters/field travel to support EMD program activities.

• (U) ($1,643) Consulting services support.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

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) ($8,590) Continue providing aircraft interface information to EMD contractor to include any available wind tunnel data.

- (U) ($11,395) Continue monitoring EMD contract, continue DT-IIA flight testing, complete DT-IIA within the fourth quarter, begin preparations for DT-IIB, and start DT-IIB.

- (U) ($1,980) Headquarters/field travel.

- (U) ($1,252) Consulting services support.

- (U) ($1,782) Begin digital upgrade modification to LAU-7 launcher.

3. (U) FY 1999 PLAN: (Navy Share Only)

- (U) ($31,514) Continue EMD efforts.

- (U) ($8,110) Continue providing aircraft interface to the EMD contractor. Relate results of wind tunnel testing to missile/platform interface and compatibility efforts.

- (U) ($21,183) Continuation of EMD contractor monitoring, complete DT-IIB and start DT-IIC.

- (U) ($1,917) Headquarters/field travel.

- (U) ($1,383) Consulting services support.

- (U) ($2,770) Continue digital upgrade to LAU-7 launcher.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0207161N PROJECT NUMBER: E0457
PROGRAM ELEMENT TITLE: TACTICAL AIR INTERCEPT PROJECT TITLE: AIM-9X

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1997	FY 1998	FY 1999
(U) FY 1998 President's Budget:	52,463	60,079	66,040
(U) Appropriated Value:	54,915		
(U) Adjustments from PRESBUDG:	-7,142		+837
(U) FY 1999 OSD/OMB Budget Submit:	45,321	60,079	66,877

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1997 net reduction of -$7,142 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 -$64 thousand Revised Economic Adjustment. The FY 1999 net increase of +$837 reflects a Navy Working Capital Fund(NWCF) surcharge of +$330 thousand, NWCF Research Labs adjustment of +$594 thousand and a -$87 thousand decrease for minor balancing adjustments.

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

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

WPN	FY 2000	FY 2001	FY 2002	FY 2003	TO COMPLETE	TOTAL PROGRAM
Qty	75	125	300	300	4,200	5,000
Dollars	32,967	36,659	64,372	69,124	1,229,973	1,433,095

(U) RELATED RDT&E:
(U) DA PE 0603715D (AIM-9 CONSOLIDATED PROGRAM)
(U) AF PE 0207161F (TACTICAL AIM MISSILE)

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0207161N PROJECT NUMBER: E0457
PROGRAM ELEMENT TITLE: TACTICAL AIR INTERCEPT PROJECT TITLE: AIM-9X

D. (U) SCHEDULE PROFILE:

	FY 1997	FY 1998	FY 1999	TO COMPLETE
Program Milestones	1Q MS-II			2Q/00 LRIP DAB
Engineering Milestones	4Q DR I	3Q DR II	3Q TRR TECHEVAL	4Q/00 TRR for OPEVAL
T&E Milestones	2Q/97-4Q/98 DT-IIA	4Q/98-4Q/99 DT-IIB/C 4Q/99-1Q/00 OT-IIA	1Q/99-3Q/00 DT-IID 4Q/99-1Q/00 OT-IIA	4Q/00-3Q/01 OT-IIB
Contract Milestones	1Q Award EMD Contract			2Q/00 LRIP

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: September 1997

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	FY 1997	FY 1998	FY 1999
a. Primary Hardware Development	27,543	35,080	31,514
b. Government Engineering Support	7,440	7,860	11,633
c. Contractor Engineering Support	5,190	8,590	8,110
d. Miscellaneous	2,714	2,950	3,018
e. Development Test & Evaluation	2,005	3,535	9,550
f. Headquarters Travel	429	282	282
g. LAU-7 Launcher	0	1,782	2,770
Total	45,321	60,079	66,877

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT BREAKDOWN DATE: September 1997

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

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										
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	122,392	122,392	0	27,543	35,080	31,514	28,255	122,392
McDonnell-Douglas										
St Louis MO	C/CPFF	JAN 95	24,397	24,397	1,187	5,190	8,590	8,110	1,320	24,397
NAWC CL	WR	OCT 98	74,999	74,999	9,744	8,231	9,723	19,179	28,122	74,999
MISC I/H (Efforts < $2.0M)										
	VARIOUS	VARIOUS	13,911	13,911	764	2,714	3,652	3,921	2,860	13,911
GOVT (TBD)	WR	OCT 98	22,285	22,285			1,782	2,770	17,733	22,285
Support and Management										
Various Contracts	TBD	OCT 98	TBD	6,903	1,136	1,643	1,252	1,383	1,489	6,903

Test and Evaluation (Included in Product Development)

* FY95 and prior funded under P.E. 0603715D. FY96 funded under P.E. 0207161N.

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: September 1997

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0207161N PROJECT NUMBER: E0457
PROGRAM ELEMENT TITLE: TACTICAL AIR INTERCEPT PROJECT TITLE: AIM-9X

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	26,967	43,678	58,827	65,494	78,290	273,256
Subtotal Support and Management	1,136	1,643	1,252	1,383	1,489	6,903
Subtotal Test and Evaluation	0	0	0	0	0	0
Total Project	28,103	45,321	60,079	68,877	79,779	280,159

* FY95 and prior funded under P.E. 0603715D. FY96 funded under P.E. 0207161N

DATE: September 1997

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	5,700	4,911	4,704	4,473	4,533	4,620	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.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE:September 1997

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0303109N
PROGRAM ELEMENT TITLE: Satellite 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
X1880 Joint Terminal Project Office	1,735	0	0	0	0	0	0	CONT.	CONT.
X0728 EHF SATCOM Terminals	13,259	16,177	16,474	8,861	7,721	6,945	8,069	CONT.	CONT.
X0731 Fleet Satellite Communications	17,055	849	2,147	2,834	1,489	1,479	1,514	CONT.	CONT.
TOTAL	32,049	17,026	18,621	11,695	9,210	8,424	9,583	CONT.	CONT.

(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.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE:September 1997

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	1,735	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) ($ 589) 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 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:

	FY 1997	FY 1998	FY 1999
(U) FY 1998 President's Budget:	2,924	0	0
(U) Appropriated Value			
(U) Adjustments from FY 1998 PRESBUDG:	-1189	0	0
(U) FY 1999 OSD/OMB Budget Submit:	1,735	0	0

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1997 ($-1,189K): FY 1997 decreased $73K for SBIR Transfer, decreased $1,113K to finance other Navy department requirements, and decreased $3K to account for inflation adjustments.

(U) Schedule: Not Applicable.

(U) Technical: Not Applicable.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE:September 1997

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0303109N PROJECT NUMBER: X1880
PROGRAM ELEMENT TITLE: Satellite Communications PROJECT TITLE: Joint Terminal Project Office

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

D. (U) SCHEDULE PROFILE: Not applicable.

A. (U) PROJECT COST BREAKDOWN: Not Applicable.

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION: Not Applicable.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE:September 1997

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	13,259	16,177	16,474	8,861	7,721	6,945	8,069	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) ($ 8,652) 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.

- (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) ($ 8,954) 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) ($ 1,553) 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) ($ 1,139) 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) ($ 3,206) Continue Milstar terminal and MDR development engineering analysis and management.

3. (U) FY 1999 PLAN:

- (U) ($ 6,855) 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.
- (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) ($ 1,610) Continue Milstar terminal and MDR development engineering analysis and management.

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1997	FY 1998	FY 1999
(U) FY 1998 President's Budget:	14,416	16,177	25,161
(U) Appropriated Value:			

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE:September 1997

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0303109N PROJECT NUMBER: X0728
PROGRAM ELEMENT TITLE: Satellite Communications PROJECT TITLE: EHF SATCOM Terminals

(U) Adjustments from FY 1998 PRESBUDG:	-1,157	0	-8,687
(U) FY 1999 OSD/OMB Budget Submit:	13,259	16,177	16,474

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1997 ($-1,157K): FY 1997 decreased $344K for SBIR transfer, decreased $789K to finance other navy department requirements, decreased $7K for FFRDC reductions, and decreased $17K to account for inflation adjustments. FY 1999 ($-8,687K): FY 1999 Redirected $267K to develop and update overarching C4ISR mission requirements, decreased $8,500K to finance higher priority Navy department requirements, increased $80K due to Navy Working Capital Fund (NWCF)adjustments.

(U) Schedule: The FY 1999 adjustment of $-8,767K delays development of terminal upgrades and Advanced EHF until the out years.

(U) Technical: Not applicable.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE:September 1997

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0303109N PROJECT NUMBER: X0728
PROGRAM ELEMENT TITLE: Satellite Communications PROJECT TITLE: EHF SATCOM Terminals

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 SHIP* 321000	53,900	35,293	58,700	73,321	54,345	58,620	47,331	CONT.	CONT.
OPN SHORE* 322000	17,976	2,304	15,601	36,394	21,903	17,097	40,870	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

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE:September 1997

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0303109N PROJECT NUMBER: X0728
PROGRAM ELEMENT TITLE: Satellite Communications PROJECT TITLE: EHF SATCOM Terminals

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 11/97	

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE:September 1997

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		FY 1997	FY 1998	FY 1999
a.	Project Management	458	504	688
b.	Systems Engineering	2,005	2,578	3,060
c.	Prime Mission Equipment	8,540	10,140	8,273
d.	System Test & Evaluation	920	1,337	3,028
e.	Integrated Logistics Support	663	794	825
f.	Site/Platform Integration	673	824	600
	Total:	13,259	16,177	16,474

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE:September 1997

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

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development										
Raytheon	SS/CPFF	1/94	53,943	53,943	15,435	6,612	7,927	9,035	CONT.	CONT.
F/O EHF Studies/Upgrades										
NRaD	WR	10/93	N/A	N/A	5,582	1,973	2,640	2,735	CONT.	CONT.
Other	Var	Var	Var	Var	2,884	775	1,082	971	CONT.	CONT.
Support and Management										
NRaD	WR	10/93	N/A	N/A	2,742	1,305	1,445	870	CONT.	CONT.
NUWC	WR	10/93	N/A	N/A	2,529	1,040	1,163	432	CONT.	CONT.
Other	Var	Var	Var	Var	1,846	900	993	336	CONT.	CONT.
Test and Evaluation										
Other	Var	Var	Var	Var	2,085	654	927	2,095	CONT.	CONT.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE:September 1997

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0303109N PROJECT NUMBER: X0728
PROGRAM ELEMENT TITLE: Satellite Communications PROJECT TITLE: EHF SATCOM Terminals

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	NONE								
Support and Management	NONE								
Test and Evaluation	NONE								
Subtotal Product Development				23,901	9,360	11,649	12,741	CONT.	CONT.
Subtotal Support and Management				7,109	3,245	3,601	1,638	CONT.	CONT.
Subtotal Test and Evaluation				2,085	654	927	2,095	CONT.	CONT.
Total:				33,103	13,259	16,177	16,474	CONT.	CONT.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE:September 1997

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0303109N PROJECT NUMBER: X0731
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
X0731 Fleet Satellite Communications	17,055	849	2,147	2,834	1,489	1,479	1,514	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 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.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE:September 1997

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0303109N PROJECT NUMBER: X0731
PROGRAM ELEMENT TITLE: Satellite Communications PROJECT TITLE: EHF SATCOM Terminals

(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) ($ 1,117) Completed OPEVAL for TACINTEL II Build 1 software.
- (U) ($ 1,008) Achieved Milestone III (MS III) for TACINTEL II Build 1.
- (U) ($ 1,036) Initiated Phase II Build 2 development of INTELNET.
- (U) ($ 1,013) Completed testing of Mini-DAMA (V)3 (DT/OT II) systems.
- (U) ($10,626) Obtained MS 0/I/II decision. Complete Phase I Build 1 of JMINI software and associated functions. Commence development of Phase II Build 2 JMINI software.
- (U) ($ 385) Commenced software development and test and evaluation of ADNS implementation.
- (U) ($ 749) Completed Mini-DAMA SSA IV&V.
- (U) ($ 561) Conducted SHF SATCOM interoperability and certification tests with evolving joint MILSATCOM architecture.
- (U) ($ 560) Developed and update Naval Command, Control, Communications, Computers, Intelligence, Sensors and Reconnaissance (C4ISR) implementation guidance.

2. (U) FY 1998 PLAN:

- (U) ($ 834) Implementation of advanced Special Intelligence (SI) TACINTEL II into Automated Digital Network System (ADNS)and an additional $979K is forward financed with FY 97 funding due to low expenditures in FY 96.
- (U) ($ 15) Develop and update Naval Command, Control, Communications, Computers, Intelligence, Sensors and Reconnaissance (C4ISR) implementation guidance.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE:September 1997

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0303109N PROJECT NUMBER: X0731
PROGRAM ELEMENT TITLE: Satellite Communications PROJECT TITLE: EHF SATCOM Terminals

3. (U) FY 1999 PLAN:

- (U) ($ 2,147) Continue implementation of TACINTEL II into ADNS.

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1997	FY 1998	FY 1999
(U) FY 1998 President's Budget:	19,020	849	2,247
(U) Appropriated Value			
(U) Adjustments from FY 1998 PRESBUDG:	-1965	0	-100
(U) FY 1999 OSD/OMB Budget Submit:	17,055	849	2,147

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1997 ($- 1,965K): FY 1997 decreased $90K for SBIR Transfer, decreased $1,853K to finance other Navy department requirements, and decreased $22K to account for inflation adjustments.
FY 1999 ($-100K): FY 1999 redirected $36K to develop and update overarching C4ISR mission requirements, and decreased $64K for Navy Working Capital Fund (NWCF) adjustments.

(U) Schedule: Not Applicable.

(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.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE:September 1997

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0303109N PROJECT NUMBER: X0731
PROGRAM ELEMENT TITLE: Satellite Communications PROJECT TITLE: EHF SATCOM Terminals

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 SHIP* 321000	32,247	21,148	31,785	37,650	42,710	72,378	72,163	CONT.	CONT.
OPN SHORE* 322000	3,812	2,485	55,607	28,981	4,353	1,306	1,297	CONT.	CONT.

*Includes UHF, SHF and Mini-Dama 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

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE:September 1997

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0303109N PROJECT NUMBER: X0731
PROGRAM ELEMENT TITLE: Satellite Communications PROJECT TITLE: EHF SATCOM Terminals

D. (U) SCHEDULE PROFILE:

	FY 1997	FY 1998	FY 1999
Program Milestones	M-D(V)1 IOC 3/97 M-D(V)3 IOC 6/97	TAC II+ 1 MS III 8/97	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			

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE:September 1997

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0303109N PROJECT NUMBER: X0731
PROGRAM ELEMENT TITLE: Satellite Communications PROJECT TITLE: EHF SATCOM Terminals

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

Project Cost Categories		FY 1997	FY 1998	FY 1999
a.	Project Management	360	50	218
b.	Systems Engineering	3,091	675	1,660
c.	Prime Mission Equipment	8,183	0	0
d.	System Test & Evaluation	3,628	0	0
e.	Integrated Logistics Support	1,793	124	269
f.	Site/Platform Integration	0	0	0
	Total:	17,055	849	2,147

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE:September 1997

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0303109N PROJECT NUMBER: X0731
PROGRAM ELEMENT TITLE: Satellite Communications PROJECT TITLE: EHF SATCOM Terminals

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										
Titan	FPI	07/89	N/A	N/A	6,309	6,730	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	3,181	483	1 ,010	CONT.	CONT.
Support and Management										
CSC	CPFF	Var	N/A	N/A	2,957	631	0	0	CONT.	CONT.
NAVAIR/ISC	PD		N/A	N/A	1,176	0	124	269	CONT.	CONT.
Other	Var	Var	N/A	N/A	4,979	4,471	50	218	CONT.	CONT.
Test and Evaluation										
Other	Var	Var	N/A	N/A	7,816	1,480	0	0	CONT.	CONT.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE:September 1997

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0303109N PROJECT NUMBER: X0731
PROGRAM ELEMENT TITLE: Satellite Communications PROJECT TITLE: EHF SATCOM Terminals

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									
Support and Management									
Test and Evaluation									
Subtotal Product Development				27,633	10,473	675	1,660	CONT.	CONT.
Subtotal Support and Management				9,112	5,102	174	487	CONT.	CONT.
Subtotal Test and Evaluation				7,816	1,480	0	0	CONT.	CONT.
Total:				44,561	17,055	849	2,147	CONT.	CONT.

DATE: September 1997

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) ($5,700) Continue systems engineering and participation in AMRAAM P3I Phase 2. Commence Phase 3 programs (incorporating additional Air Force funding of $50,781) with emphasis on Navy unique requirements and aircraft integration compatibility requirements. Accomplish P3I Phase 3 Milestone II.

3. (U) FY 1999 PLAN:

(U) ($4,911) Complete P3I Phase 2. Continue systems engineering and participation in AMRAAM P3I Phase 3 programs (incorporating additional Air Force funding of $45,985) with emphasis on Navy unique requirements and aircraft integration compatibility requirements. Conduct P3I Phase 3 Preliminary Design Review.

DATE: September 1997

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0207163N PROJECT NUMBER: E0981
PROGRAM ELEMENT TITLE: AMRAAM PROJECT TITLE: AMRAAM

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1997	FY 1998	FY 1999
(U) FY 1998 President's Budget:	2,149	5,700	4,855
(U) Appropriated Value:	2,274		
(U) Adjustments from PRESBUDG:	-21		+56
(U) FY 1999 OSD/OMB Budget Submit:	2,128	5,700	4,911

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY 1997 reduction includes -$3 thousand for Revised Economic Adjustments and -$18 thousand for Small Business Innovation Research assessment. The FY 1999 change results from a +$56 thousand increase for A Navy Working Capital Fund surcharge.

(U) Schedule: P3I-2 Flight Test slipped one quarter due to the non-availability of a shortened control actuator system and Air Force reductions in FY1997 R&D funding.

(U) Technical: Not Applicable

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

WPN/P1#6	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
Qty	100	100	100	100	100	100	100	656	2,419
$	56,425	57,066	64,197	67,059	67,798	68,544	71,755	414,518	1,724,956

DATE: September 1997

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:

	FY 1997	FY 1998	FY 1999	To Complete
Program Milestones	2Q IOC P3I-2			
Engineering Milestones			2Q P3I-3 PDR	
T&E Milestones	2-4Q P3I-2 FLT TEST	1Q P3I-2 FLT TEST		
Contract Milestones		3Q P3I-3 EMD CTK AWD		

DATE: September 1997

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	FY 1997	FY 1998	FY 1999
a. System Integration	330	340	300
b. Pre-Planned Product Improvement	996	3,646	2,633
c. Systems Engineering	542	1,434	1,698
d. Travel	260	280	280
Total	2,128	5,700	4,911

DATE: September 1997

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

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										
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	3,991	3,387	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

Item Description	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Delivery Date	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development									
Support and Management									
Test and Evaluation									

DATE: September 1997

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

	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Subtotal Production Development	41,303	1,741	5,050	4,287	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	5,700	4,911	Cont.	Cont.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

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	22,762	20,291	22,955	25,247	25,549	25,123	24,742	CONT.	CONT.
TOTAL	22,762	20,291	22,955	25,247	25,549	25,123	24,742	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 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.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0303140N PROJECT NUMBER: X0734
PROGRAM ELEMENT TITLE: Information Systems Security Program PROJECT TITLE: Information Systems Security (INFOSEC)

(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	22,762	20,291	22,955	25,247	25,549	25,123	24,742	CONT.	CONT.
Current Funding Available	22,762								

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 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) ($3,768) 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.
- (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.

2. (U) FY 1998 PLAN:

- (U) ($300) Complete development of the EIP.
- (U) ($1,179) 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) ($3,841) 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.
- (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) ($1,617) 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) ($369) 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.

- (U) ($5,703) Begin development of Tier 1 Phase 2, incoporating 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) ($1,880) 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) ($1,446) 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.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0303140N PROJECT NUMBER: X0734
PROGRAM ELEMENT TITLE: Information Systems Security Program PROJECT TITLE: Information Systems Security (INFOSEC)

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1997	FY 1998	FY 1999
(U) FY 1998 President's Budget:	25,525	20,291	25,301
(U) Appropriated Value:			
(U) Adjustments from FY98 PRESBUDG:	-2,763	0	-2,346
(U) FY 1999 OSD/OMB Budget Submission:	22,762	20,291	22,955

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding:

(U) FY 1997: -$379K transfer for SBIR assessment; -$100K FFRDC respread; -$2,254 reduction to finance other higher priority programs and -$30 supplemental revised economic assumption

(U) FY 1999: -$405K which was redirected to develop and update overarching C4ISR mission requirements; -$1,785K C4I expenditure carryover and -$156K for NWCF rate adjustment.

(U) Schedule: Not Applicable

(U) Technical: Not Applicable

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

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)	24,215	37,675	54,986	96,259	91,008	86,780	71,274	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)

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

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:

	FY 1997	FY 1998	FY 1999
EKMS			
Program Milestones			
Engineering Milestones	1Q-SSR 3Q-Build Review 1 4Q-Build Rev 2	1Q-Build Rev 3 4Q-IOC	
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	

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

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	FY 1997	FY 1998	FY 1999
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	13,235	10,808	11,062
Current Allocation	22,762	20,291	22,955

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										
VIASAT	CPFF	9/93	7,582	7,582	6,582	700	300	0	0	7,582
SAIC	CPAF	8/95	25,258	25,258	8,858	8,525	6,975	900	0	25,258
Various	Various	Various	Various	Various	13,348	10,187	10,042	18,736	CONT.	CONT.
Support and Management										

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

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
Support and Management (con't)										
Various	Various	Various	Various	Various	3,212	3,350	2,974	3,319	CONT.	CONT.
Test and Evaluation			Not applicable							
GOVERNMENT FURNISHED PROPERTY			Not Applicable							
Subtotal Product Development					18,771	19,412	17,317	19,636	CONT.	CONT.
Subtotal Support and Management					3,212	3,350	2,974	3,319	CONT.	CONT.
Subtotal Test and Evaluation										
Current Available					21,983	22,762	20,291	22,955	CONT.	CONT.

FY 1998 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0303150N

PROGRAM ELEMENT TITLE: Global Command and Control System

(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
X2304 Global Command and Control System (GCCS)	0	498	477	516	527	541	554	CONT.	CONT.
TOTAL	0	498	477	516	527	541	554	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.

FY 1998 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

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	TO COMPLETE	TOTAL PROGRAM
X2304 Global Command and Control System (GCCS)	0	498	477	516	527	541	554	CONT.	CONT.

A. (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 provide 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.

FY 1998 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

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) ($490) 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) implelmentation 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) ($477) 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)

FY 1998 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

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:

	FY 1997	FY 1998	FY 1999
(U) FY1998 PRESIDENT'S BUDGET:	0	498	508
(U) Appropriated Value			
(U) Adjustments from FY 1998 PRESBUDG:	0	0	-31
(U) FY 1999 OSD/OMB Budget Submit:	0	498	477

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY99 $-8K Redirected to develop and update overarching C4ISR mission requirements. $-23K reduction to fund higher Navy priorities.

(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	2,744	1,560	3,010	3,230	3,340	5,243	3,962	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

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0305160N
PROGRAM ELEMENT TITLE: Defense Meteorological Satellite

(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
X0524 DMSP - Navy Support	743	6,489	8,678	12,214	21,157	22,542	21,397	Cont.	Cont.
X1452 GEOSAT	16,017	376	1,801	1,800	1,800	1,011	1,000	Cont.	Cont.
Total	16,760	6,865	10,479	14,014	22,957	23,553	22,397	Cont.	Cont.

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This Program Element (PE) includes two projects - the DMSP Navy Support project and the Geodetic/Geophysical Satellite (GEOSAT) project. The Defense Meteorological Satellite Program (DMSP) is a Joint Service use program which supports sensor and satellite engineering and technology. The DMSP Navy Support project provides for Navy participation in current DMSP and future Navy unique sensor development efforts 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 AF PE for DMSP/NPOESS, and are in accordance with current inter-service agreements. The GEOSAT satellite provided ocean topography information from 1985 until it failed in January 1990. In FY 1991, the Navy began the development of a follow-on capability to continue providing this required ocean topography information via the GEOSAT follow-on (GFO) project.

(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.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0305160N PROJECT NUMBER: X0524
PROGRAM ELEMENT TITLE: Defense Meteorological Satellite PROJECT TITLE: DMSP-NAVY SUPPORT Program

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
X0524 DMSP - Navy Support	743	6,489	8,678	12,214	21,157	22,542	21,397	Cont.	Cont.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The DMSP Navy Support project provides for Navy participation in current DMSP and future Navy unique sensor development efforts 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 AF PE for DMSP/NPOESS, and are in accordance with current inter-service 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 Navy participation as a voting member of the DMSP Configuration Control Board (CCB).

(U) PROGRAM ACCOMPLISMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (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) ($262) 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) ($512) Participate in convergence system studies and systems engineering trade-off evaluations for the overall operational requirements.
- (U) ($130) Continue participation on the DMSP CCB.
- (U) ($180) Continue monitor sensor and program developments.
- (U) ($5,616) Support METOC satellite operations.
- (U) ($51) Develop and update Naval Command, Control, Communications, Computers, Intelligence, Sensors and Reconnaissance (C4ISR) implementation guidance. Develop and update Naval C4ISR mission to incorporate an overarching operational, systems, technical and information architecture. Conduct associated C4ISR analyses and studies.

3. (U) FY 1999 PLAN:

- (U) ($700) Prepare for validation effort associated with the expected launch of the first DMSP SSMIS (Microwave Imager/Sounder).
- (U) ($190) Continue participation on the DMSP CCB.
- (U) ($180) Continue monitoring sensor and program developments.

- (U) ($5,608) Begin wind-field satellite and sensor design and development.
- (U) ($2,000) Continue METOC satellite OPS support.

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1997	FY 1998	FY 1999
(U) FY 1998 President's Budget:	772	2,789	8,745
(U) Adjustments from FY 1998 PRESBUDG:	-29	+3,700	-67
(U) FY 1999 OSD/OMB Budget submit:	743	6,489	8,678

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding:

(U) FY 1997: (-$13K) SBIR assessment. (-$16K) Minor Navy adjustments.

(U) FY 1998: (+3,700) Navy plus up to accelerate the demonstration of an on-orbit wind field sensor (WindSat) in accordance with interagency agreements.

(U) FY 1999: (-$67K) Redirected to develop and update overarching C4ISR mission requirements.

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0305160N PROJECT NUMBER: X0524
PROGRAM ELEMENT TITLE: Defense Meteorological Satellite PROJECT TITLE: DMSP-NAVY SUPPORT Program

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

(U) RELATED RDT&E: PE 0305160F, Air Force DMSP - provides AF program management for DMSP
PE 0604218N, Air/Ocean Equipment Engineering - AN/SMQ-11 satellite receiver/recorder system engineering to receive data from DMSP onboard selected ships and shore sites.

D. (U) SCHEDULE PROFILE: Not applicable.

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: September 1997

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0305160N PROJECT NUMBER: X0524
PROGRAM ELEMENT TITLE: Defense Meteorological Satellite PROJECT TITLE: DMSP - NAVY SUPPORT Program

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

Project Cost Categories	FY 1997	FY 1998	FY 1999
a. Sensor Engineering/Development	501	6,199	8,388
b. Contractor Engineering	242	290	290
Total	743	6,489	8,678

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											
Various	Various		CONT.	CONT.	6,748	770	743	6,489	8,678	CONT.	CONT.
Support and Management											
Test and Evaluation											

GOVERNMENT FURNISHED PROPERTY N/A

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: September 1997

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0305160N PROJECT NUMBER: X0524
PROGRAM ELEMENT TITLE: Defense Meteorological Satellite PROJECT TITLE: DMSP - NAVY SUPPORT Program

	FY 1995 & Prior	FY 1996 Budget	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Subtotal Product Development	6,748	770	743	6,489	8,678	CONT.	CONT.
Subtotal Support and Management							
Subtotal Test and Evaluation							
Total Project	6,748	770	743	6,489	8,678	CONT.	CONT.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0305160N PROJECT NUMBER: X1452
PROGRAM ELEMENT TITLE: Defense Meteorological Satellite PROJECT TITLE: GEOSAT Program

(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
X1452 GEOSAT									
	16,017	376	1,801	1,800	1,800	1,011	1,000	Cont.	Cont.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project provides a satellite-borne radar altimeter sensor to obtain ocean topography measurements from which tactically significant features such as ocean fronts, eddies, and sea-ice edges are derived. Topography provides a unique and important data source in support of a number of Naval warfare areas such as anti-submarine and undersea warfare, as well as providing other agencies such as NOAA and NASA with valuable inputs to studies involving global warming and climate change. The data was previously provided by GEOSAT from 1985 until that satellite failed in January 1990. The GEOSAT Follow-On (GFO) satellite is intended to provide interim altimetry data until altimetry data becomes available on a future environmental satellite.

(U) PROGRAM ACCOMPLISMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS:

- (U) ($360) Funded on-orbit performance incentive.
- (U) ($1,349) Began GFO-2 effort.
- (U) ($317) Continued to monitor satellite and launch operations.
- (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) ($369) Fund on-orbit performance incentive.

- (U) ($7) Develop and update Naval Command, Control, Communications, Computers, Intelligence, Sensors and Reconnaissance (C4ISR) implementation guidance. Develop and update Naval C4ISR mission to incorporate an overarching operational, systems, technical and information architecture. Conduct associated C4ISR analyses and studies.

3. (U) FY 1999 PLAN:

- (U) ($800) Fund on-orbit performance incentive.

- (U) ($1,001) Continue to monitor satellite and launch operations.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0305160N PROJECT NUMBER: X1452
PROGRAM ELEMENT TITLE: Defense Meteorological Satellite PROJECT TITLE: GEOSAT Program

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1997	FY 1998	FY 1999
(U) FY 1998 President's Budget:	12,037	376	390
(U) Adjustments from FY 1998 PRESBUDG:	+3,980	0	+1,411
(U) FY 1999 OSD/OMB Budget submit:	16,017	376	1,801

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding:

FY 1997: (+$3,980K) Sponsor plus-up to cover contractor cost overrun.

FY 1999: (+1,411) Sponsor plus-up to fully fund the on-orbit incentive fee and on-orbit operations of the GFO satellite.

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

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

(U) RELATED RDT&E: PE 0604218N, Air/Ocean Equipment Engineering AN/SMQ-11 satellite receiver/recorder system engineering to receive altimetry from GFO.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: September 1997

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0305160N PROJECT NUMBER: X1452
PROGRAM ELEMENT TITLE: Defense Meteorological Satellite PROJECT TITLE: GEOSAT Program

D. (U) SCHEDULE PROFILE:

	FY 1996	FY 1997	FY 1998	FY 1999
Program Milestones		Launch Sat #1		
Engineering Milestones		FRR 3Q		
T&E Milestones		On Orbit Tests		
Contract Milestones				

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: September 1997

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0305160N PROJECT NUMBER: X1452
PROGRAM ELEMENT TITLE: Defense Meteorological Satellite PROJECT TITLE: GEOSAT Program

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

Project Cost Categories	FY 1997	FY 1998	FY 1999
a. Satellite Development	15,689	376	1,801
b. Sensor Development	0	0	0
c. Contractor Engineering Support	328	0	0
Total	16,017	376	1,801

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											
Ball Aerospace w/Options	CPIF	8/92	85,868	85,868	47,068	19,382	15,689	376	1,801	CONT.	CONT.
Various	Various	N/A	CONT.	CONT.	5,541	820	0	0	0	CONT.	CONT.
Support and Management											
Various					2,203	350	328	0	0	CONT.	CONT.
Test and Evaluation											

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: September 1997

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0305160N PROJECT NUMBER: X1452
PROGRAM ELEMENT TITLE: Defense Meteorological Satellite PROJECT TITLE: GEOSAT Program

GOVERNMENT FURNISHED PROPERTY: N/A.

Item Description	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Delivery Date	Total FY 1995 & Prior	FY 1996 Budget	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development										
Support and Management										
Test and Evaluation										
Subtotal Product Development				52,609	20,200	15,689	376	1,801	CONT.	CONT.
Subtotal Support and Management				2,203	350	328	0	0	CONT.	CONT.
Subtotal Test and Evaluation										
Total Project				54,812	20,552	16,017	376	1,801	CONT.	CONT.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: 26 September 1997

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0305192N
PROGRAM ELEMENT TITLE: JDISS

(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
R2295 JDISS/LOCE Integration	2,439*	2,412	2,302	2,094	1,893	1,935	1,977	CONT.	CONT.

*Funded in Program Element 0604231N project R2295 in FY 97.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This program is established under the Joint Military Intelligence Program reflecting the combination of Joint Deployable Intelligence Support Systems (JDISS) program and the Linked Operations Intelligence Centers Europe (LOCE) program. The goal is to use the best functionality from LOCE and develop the system into the JDISS common intelligence baseline thereby eliminating different systems with near duplicate functionality and centering on JDISS as the DoD common intelligence workstation baseline. The RDT&E funding will be used to work on the development of LOCE functionality onto JDISS, develop LOCE tools as a model of intelligence services for a JDISS coalition system, develop and research tools for integrating information from multiple levels of security, migrate all functionality to the Defense Information Infrastructure (DII), development of JDISS segments in the Global Command and Control System and service Command, Control, Communications, Computers and Intelligence (C4I) systems, and adopt new technology as it becomes available into the JDISS intelligence 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.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: 26 September 1997

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0305192N PROJECT NUMBER: R2295
PROGRAM ELEMENT TITLE: JDISS PROJECT TITLE: JDISS/LOCE Integration

(U) PROGRAM ACCOMPLISHMENTS AND PLANS

1. (U) FY 1997 ACCOMPLISHMENTS: Funded in Program Element 0604231N project R2295 in FY 1997.
   - (U) LOCE:
     - (U) ($1,146) Work began to create a centralized office that provides a single solution for interoperability for intelligence sharing at sensitive compartmented information, collateral and NATO levels and sustains current capabilities. JDISS/LOCE research and development is required to develop interfaces to evolving theater and national intelligence platforms and sources. This JDISS/LOCE development ensures interoperability with the Navy's Joint Maritime Command Information System, Army's All Source Analysis System Warlord system, Air Force's Combat Information System, and USMC's Interactive Analysis System, while all systems continue to evolve to a common DII.
   - (U) JDISS:
     - (U) ($908) Baseline Enhancements and Testing
       - (U) Integrated and fielded new JDISS version releases, including the Windows NT platform.
       - (U) Developed and supported several Multi-Level Security initiatives.
       - (U) Designed and developed a JDISS digital broadcast system capability utilizing Global Broadcast System technology.
       - (U) Supported the Joint Warrior Interoperability Demonstration as the only intelligence community contribution.
     - (U) ($385) Integration Support
       - (U) Integrated applications as JDISS corporate services, including Signals Intelligence and Imagery Intelligence.
2. (U) FY 1998 PLAN:
   - (U) ($2,412) RDT&E funding will focus on the continued development and implementation of intelligence tools for a DII based system with functionality to deliver a robust and flexible capability for use in both U.S. and coalition warfare. Continued developments in security, collaborative computing, and communications technology will require ongoing RDT&E funding to support the greater than 4000 JDISS users worldwide. Ongoing technical

integration will also be required to continue development of enhanced JDISS interoperability with service C4I systems.

3. (U) FY 1999 PLAN:

- (U) ($2,302) RDT&E funds will continue to provide for the development and implementation of intelligence tools for a DII based system for use in both U.S. and coalition warfare. Ongoing RDT&E funds will be required to provide for continued developments in security, collaborative computing, communications technology and technical integration to continue development of enhanced JDISS interoperability with service C4I systems.

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1997	FY 1998	FY 1999
(U) FY 1998 President's Budget:	2,508	2,412	2,293
(U) Adjustments from FY 1998 PRESBUDG:	-69	0	+9
(U) FY 1999 OSD/OMB Budget Submission:	2,439	2,412	2,302

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1997 funding adjustment is due to SBIR assessment (-66) and revised economic assumptions (-3). FY 1999 adjustment is due to Navy Working Capital Funds surcharge correction (+9).

(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.

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: 26 September 1997

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0305192N
PROGRAM ELEMENT TITLE: JDISS

PROJECT NUMBER: R2295
PROJECT TITLE: JDISS/LOCE Integration

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

Project Cost Categories	FY 1997	FY 1998	FY 1999
a. Software Development	1,680	1,476	1,304
b. Systems Engineering	490	613	709
c. Operational Test and Evaluation	269	323	289
Total	2,439	2,412	2,302

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: 26 September 1997

BUDGET ACTIVITY: 5
PROGRAM ELEMENT: 0305192N
PROGRAM ELEMENT TITLE: JDISS
PROJECT NUMBER: R2295
PROJECT TITLE: JDISS/LOCE Integration

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

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Product Development:										
Miscellaneous					UNK	2,170	2,089	2,013	CONT.	CONT.
Support and Management: Not applicable.										
Test and Evaluation:										
Miscellaneous					UNK	269	323	289	CONT.	CONT.

GOVERNMENT FURNISHED PROPERTY: Not applicable.

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: 26 September 1997

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0305192N
PROGRAM ELEMENT TITLE: JDISS

PROJECT NUMBER: R2295
PROJECT TITLE: JDISS/LOCE Integration

	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Subtotal Product Development	UNK	2,170	2,089	2,013	CONT.	CONT.
Subtotal Support and Management	0	0	0	0	0	0
Subtotal Test and Evaluation	0	269	323	289	CONT.	CONT.
Total Project	UNK	2,439	2,412	2,302	CONT.	CONT.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: 26 September 1997

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	658	399	407	737	753	770	787	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.

- (U) ($182) Prototyped high risk components of next generation fence.
- (U) ($150) Initiated development of prototype transmitter module.
- (U) ($205) Improved accuracy and consistency of angular resolution and chirp processing techniques.

2. (U) FY 1998 PLAN:
   - (U) ($200) Develop and evaluate prototype X-band feed assembly as part of antenna array.
   - (U) ($100) Evaluate site distribution impacts to current system of X-band implementation.
   - (U) ($99) Demonstrate impact of high volume processing (10-100 times) on multiple site integration.

3. (U) FY 1999 PLAN:
   - (U) ($407) Initiate integrated prototyping and evaluation of next generation fence capability. Demonstrate and prototype remote processing of observation data. Evaluate transmitter module improvements.

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1997	FY 1998	FY 1999
(U) FY 1998 President's Budget:	677	399	529
(U) Adjustments from FY 1998 PRESBUDG:	-19	0	-122
(U) FY 1999 OSD/OMB Budget Submission:	658	399	407

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1997 adjustment is due to SBIR assessment (-18) and revised economic assumptions (-1). FY 1999 adjustment is due to Navy Working Capital Fund surcharge correction (+3) and reduction due to unjustified level of effort program growth (-125).

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: 26 September 1997

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0305927N PROJECT NUMBER: R0125
PROGRAM ELEMENT TITLE: Naval Space Surveillance PROJECT TITLE: Naval Space Surveillance

(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.

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: 26 September 1997

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	FY 1997	FY 1998	FY 1999
a. Project Management	20	12	19
b. Product Development	638	387	388
Total	658	399	407

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: 26 September 1997

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
Product Development										
Miscellaneous					UNK	658	399	407	CONT.	CONT.

Support and Management: Not applicable.

Test and Evaluation: Not applicable.

GOVERNMENT FURNISHED PROPERTY: Not applicable.

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: 26 September 1997

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0305927N PROJECT NUMBER: R0125
PROGRAM ELEMENT TITLE: Naval Space Surveillance PROJECT TITLE: Naval Space Surveillance

	Total FY 1996 & Prior	FY 1997 Budget	FY 1998 Budget	FY 1999 Budget	To Complete	Total Program
Subtotal Product Development	UNK	658	399	407	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	658	399	407	CONT.	CONT.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: 26 September 1997

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	79,868	*22,676	60,126	61,118	62,620	64,020	65,520	CONT.	CONT.
R2322 Acquisition Center of Excellence	4,373	**	**	**	**	**	**	**	480
TOTAL	84,241	*22,676	60,126	61,118	62,620	64,020	65,520	CONT.	CONT.

*Budgeted at $0, but will executed at $22,676 thousand in FY 1998 using carryover from FY 1997.
**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.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: 26 September 1997

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0708011N
PROGRAM ELEMENT TITLE: Manufacturing Technology Development

(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.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: 26 September 1997

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	79,868	*	60,126	61,118	62,620	64,020	65,520	CONT.	CONT.

*Funded at $22,676 thousand in FY 1998 using carryover from FY 1997.

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.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: 26 September 1997

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0708011N PROJECT NUMBER: R1050
PROGRAM ELEMENT TITLE: Manufacturing Technology Development PROJECT TITLE: Manufacturing Technology

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1997 ACCOMPLISHMENTS: (While the control amount for FY 1997 is $79,868 thousand, the actual execution amount is $94,592 thousand. This reflects the $37,400 thousand being forward financed from FY 1996 and $57,192 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 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) ($13,127) 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 $0, the actual execution amount is $22,676 thousand. This reflects FY 1997 carryover to FY 1998.)

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: 26 September 1997

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0708011N PROJECT NUMBER: R1050
PROGRAM ELEMENT TITLE: Manufacturing Technology Development PROJECT TITLE: Manufacturing Technology

- (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) ($6,000) 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) ($2,900) 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) ($5,500) 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) ($4,000) Advanced Industrial Practices - Continue efforts in identifying best commercial practices to be incorporated into the Acquisition Reform regime. Initiate efforts with NAVSEA to support the Lean Ship Initiative. Continue 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.

  -- (U) ($4,276) 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.

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: 26 September 1997

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0708011N PROJECT NUMBER: R1050
PROGRAM ELEMENT TITLE: Manufacturing Technology Development PROJECT TITLE: Manufacturing Technology

3. (U) FY 1999 PLAN:

- (U) ($60,126) The funding provided will be allocated to high priority efforts as approved by the MANTECH Executive Steering Committee. High priority projects will fall within the three top areas: Composites, Electronics and Metalworking. Efforts will be continued in energetics materials, repair technology, shipbuilding, and best manufacturing practices.

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1997	FY 1998	FY 1999
(U) FY 1998 President's Budget:	84,397	0	35,348
(U) Adjustments from FY 1998 PRESBUDG:	-4,529	0	+24,778
(U) FY 1999 OSD/OMB Budget Submission:	79,868	*	60,126

*Being funded with $22,676 thousand of FY 1997 carryover funding.

(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 (+92). FY 1999 increase reflects decision to level fund the program in FY 99 and out at $60 million per year, including inflation (+24,652), Navy Working Capital Fund (NWCF) surcharge correction (+106) and other NWCF adjustments (+20).
(U) Schedule: Not applicable.
(U) Technical: Not applicable.

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

FY 1999 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: 26 September 1997

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0708011N PROJECT NUMBER: R1050
PROGRAM ELEMENT TITLE: Manufacturing Technology Development PROJECT TITLE: Manufacturing Technology

(U) RELATED RDT&E: Not applicable.

D. (U) SCHEDULE PROFILE: Not applicable.

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: 26 September 1997

BUDGET ACTIVITY: 7
PROGRAM ELEMENT: 0708011N
PROGRAM ELEMENT TITLE: Manufacturing Technology Development
PROJECT NUMBER: R1050
PROJECT TITLE: Manufacturing Technology

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

Project Cost Categories	FY 1997	FY 1998	FY 1999
a. Process Development	88,159	20,676	55,000
b. Program Management Support	6,433	2,000	5,126
Total	94,592*	22,676**	60,126

*Reflects FY 1997 actual execution. This includes $37,400 thousand of FY 1996 carryover and $57,192 thousand in FY 1997 funds.
**Funded at $22,676 thousand in FY 1998 using carryover from FY 1997.

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: 26 September 1997

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	6,000	TBD	CONT.	CONT.
CTC	SS/CPFF	1988	CONT.	CONT.	148,495	27,000	2,400	TBD	CONT.	CONT.
EWI	C/BAA	1996	CONT.	CONT.	5,000	3,100	1,500	TBD	CONT.	CONT.
ACI	C/BAA	1995	CONT.	CONT.	3,500	7,668	2,400	TBD	CONT.	CONT.
UNO	C/BAA	1994	CONT.	CONT.	27,235	6,000	2,000	TBD	CONT.	CONT.
PSU	C/CPFF	1992	CONT.	CONT.	35,820	4,900	2,300	TBD	CONT.	CONT.
BFTC	C/CA	1994	CONT.	CONT.	750	10,518	500	TBD	CONT.	CONT.
PTI	C/IDIO	1992	CONT.	CONT.	19,841	4,500	1,000	TBD	CONT.	CONT.
NSWC-CD	WX	1996	UNK	UNK	UNK	2,045	TBD	TBD	CONT.	CONT.
NSWC-IN	WX	1995	UNK	UNK	UNK	3,400	TBD	TBD	CONT.	CONT.
NAWC-WD	WX	1996	UNK	UNK	UNK	1,200	0	0	0	UNK
IPI	C/CPFF	1995	UNK	UNK	4,274	2,700	3,000	0	0	9,974
Miscellaneous						7,561	1,576	TBD	CONT.	CONT.

Support and Management: Not applicable.
Test and Evaluation: Not applicable.
GOVERNMENT FURNISHED PROPERTY: Not applicable.

FY 1999 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: 26 September 1997

BUDGET ACTIVITY: 7
PROGRAM ELEMENT: 0708011N
PROGRAM ELEMENT TITLE: Manufacturing Technology Development
PROJECT NUMBER: R1050
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	94,592	22,676	60,126	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	94,592	22,676	60,126	CONT.	CONT.

MANTECH would be approximately 52%.

This page intentionally blank.