DEPARTMENT OF THE NAVY
FY 1997 BUDGET ESTIMATES

19960705 043

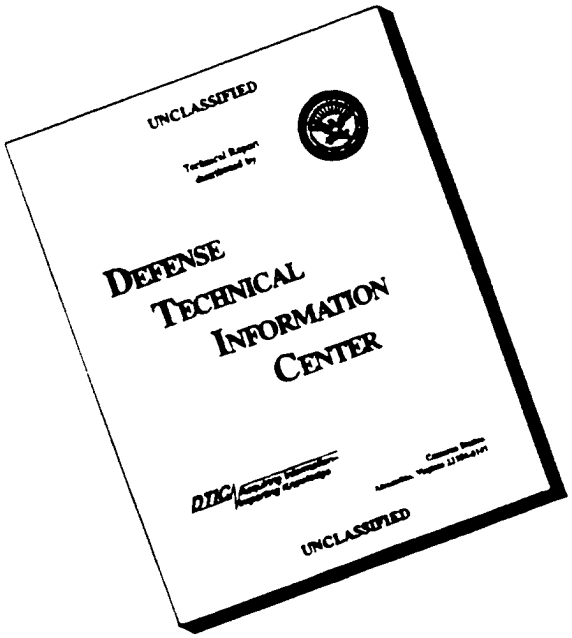
JUSTIFICATION OF ESTIMATES
MARCH 1996

RESEARCH, DEVELOPMENT, TEST & EVALUATION
BUDGET ACTIVITY 4: DEMONSTRATION & VALIDATION

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LINE NO	PROGRAM ELEMENT NUMBER	ITEM NOMENCLATURE	BA	Thousands of Dollars FY 1995	FY 1996	FY 1997	SEC
28	0603207N	Air/Ocean Tactical Application	04	16,509	19,214	16,519	U
29	0603208N	Training System Aircraft	04	4,310	2,977	2,405	U
30	0603216N	Aviation Survivability	04	15,901	15,875	6,313	U
31	0603254N	ASW Systems Development	04	29,373	29,216	19,473	U
32	0603261N	Tactical Airborne Reconnaissance	04	43,704	20,214	24,085	U
33	0603382N	Adv Combat System Technology	04	2,804	2,687	3,858	U
34	0603451N	Tactical Space Operations	04	2,002	933	-	U
35	0603502N	Surface & Shallow Water Mine Countermeasures	04	43,734	54,367	86,995	U
36	0603504N	Adv Submarine Combat Systems Dev	04	22,863	27,207	19,149	U
37	0603506N	Surface Ship Torpedo Defense	04	20,353	9,714	5,772	U
38	0603512N	Carrier Systems Development	04	15,693	12,370	12,745	U
39	0603513N	Shipboard System Component Dev	04	25,640	16,280	9,948	U
40	0603514N	Ship Combat Survivability	04	14,149	11,288	5,749	U
41	0603525N	PILOT FISH	04	33,722	75,333	93,910	U
42	0603528N	Non-Acoustic ASW	04	-	9,689	-	U
43	0603536N	RETRACT JUNIPER	04	19,650	9,688	10,398	U
44	0603542N	Radiological Control	04	3,442	3,104	2,886	U
45	0603553N	Surface ASW	04	6,469	6,441	3,964	U
46	0603561N	Advanced Submarine System Dev	04	81,944	53,870	26,400	U
47	0603562N	Submarine Tactical Warfare Sys	04	7,221	4,794	4,578	U
48	0603563N	Ship Concept Advanced Design	04	28,484	52,044	13,807	U
49	0603564N	Ship Prelim Design & Feasibility Studies	04	30,311	9,210	12,942	U

LINE NO	PROGRAM ELEMENT NUMBER	ITEM NOMENCLATURE	BA	Thousands of Dollars FY 1995	FY 1996	FY 1997	SEC
50	0603570N	Advanced Nuclear Power Systems	04	130,085	137,370	131,965	U
51	0603573N	Adv Surface Machinery Systems	04	78,026	80,256	59,773	U
52	0603576N	CHALK EAGLE	04	57,825	109,739	149,679	U
53	0603582N	Combat System Integration	04	9,298	5,246	3,879	U
54	0603609N	Conventional Munitions	04	39,507	34,329	26,490	U
55	0603610N	Advanced Warhead Dev (MK-50)	04	-	2,900	1,329	U
56	0603611M	Marine Corps Assault Vehicles	04	29,158	38,822	40,106	U
57	0603612M	MC Mine Countermeasures	04	4,540	1,722	592	U
58	0603635M	MC Ground Combat/Support System	04	26,170	49,338	44,891	U
59	0603654N	Jt Serv Explosive Ordnance Dev	04	8,362	7,072	4,639	U
60	0603709N	Advanced Marine Biological System	04	3,478	-	-	U
61	0603711N	Fleet Tactical Development	04	4,573	4,122	3,398	U
62	0603713N	Ocean Engineering Development	04	14,047	4,982	8,606	U
63	0603721N	Environmental Protection	04	48,975	63,863	48,401	U
64	0603724N	Navy Energy Program	04	6,528	1,917	3,080	U
65	0603725N	Facilities Improvement	04	2,493	1,748	2,239	U
66	0603734N	CHALK CORAL	04	67,214	68,847	77,675	U
67	0603746N	RETRACT MAPLE	04	99,891	85,024	83,809	U
68	0603748N	LINK PLUMERIA	04	30,962	20,816	26,433	U
69	0603751N	RETRACT ELM	04	39,825	30,411	24,993	U
70	0603755N	Ship Self Defense	04	229,634	316,446	216,486	U
71	0603763N	Warfare Systems Archit & Engineering	04	9,075	-	-	U

LINE NO	PROGRAM ELEMENT NUMBER	ITEM NOMENCLATURE	BA	Thousands of Dollars FY 1995	FY 1996	FY 1997	SEC
72	0603785N	Combat Systems Oceanographic Perf Assessment	04	19,637	15,511	13,650	U
73	0603787N	Special Processes	04	32,301	69,975	82,764	U
74	0603790N	NATO Research and Development	04	-	-	9,933	U
75	0603795N	Gun Weapons Systems Technology	04	18,862	32,958	42,204	U
76	0603800N	Joint Adv Strike Technology Program	04	98,272	81,215	246,833	U
77	0604707N	SEW Architecture/Eng Support	04	5,941	5,468	5,212	U
TOTAL	Demonstration and Validation (Dem/Val)			1,582,957	1,716,612	1,740,955	

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Exhibit R-1 | Department of the Navy | March 1996

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

--- Alphabetic Listing ---

In Thousands of Dollars

P-1 NUMBER	PROGRAM ELEMENT	PROGRAM NAME	BA	FY 1995	FY 1996	FY 1997	C
33	603382	Advanced Combat System Technology	4	2,804	2,687	3,858	U
60	603709	Advanced Marine Biological System	4	3,478			U
50	603570	Advanced Nuclear Power Systems	4	130,085	137,370	131,965	U
36	603504	Advanced Submarine Combat Systems Dev	4	22,863	27,207	19,149	U
46	603561	Advanced Submarine System Dev	4	81,944	53,870	26,400	U
51	603573	Advanced Surface Machinery Systems	4	78,026	80,256	59,773	U
55	603610	Advanced Warhead Dev (MK-50)	4		2,900	1,329	U
28	603207	Air/Ocean Tactical Application	4	16,509	19,214	16,519	U
31	603254	ASW Systems Development	4	29,373	29,216	19,473	U
30	603216	Aviation Survivability	4	15,901	15,875	6,313	U
38	603512	Carrier Systems Development	4	15,693	12,370	12,745	U
66	603734	Chalk Coral	4	67,214	68,847	77,675	U
52	603576	Chalk Eagle	4	57,825	109,739	149,679	U
53	603582	Combat System Integration	4	9,298	5,246	3,879	U
72	603785	Combat Systems Oceanographic Perf Assessment	4	19,637	15,511	13,650	U
54	603609	Conventional Munitions	4	39,507	34,329	26,490	U
63	603721	Environmental Protection	4	48,975	63,863	48,401	U
65	603725	Facilities Improvement	4	2,493	1,748	2,239	U
61	603711	Fleet Tactical Development	4	4,573	4,122	3,398	U
75	603795	Gun Weapons Systems Technology	4	18,862	32,958	42,204	U

Exhibit R-1 | Department of the Navy | March 1996

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

--- Alphabetic Listing ---

In Thousands of Dollars

P-1 NUMBER	PROGRAM ELEMENT	PROGRAM NAME	BA	FY 1995	FY 1996	FY 1997	C
76	603800	Joint Adv Strike Technology Program	4	98,272	81,215	246,833	U
59	603654	Jt Serv Explosive Ordnance Dev	4	8,362	7,072	4,639	U
68	603748	Link Plumeria	4	30,962	20,816	26,433	U
56	603611	Marine Corps Assault Vehicles	4	29,158	38,822	40,106	U
58	603635	MC Ground Combat/Support System	4	26,170	49,338	44,891	U
57	603612	MC Mine Countermeasures	4	4,540	1,722	592	U
64	603724	Navy Energy Program	4	6,528	1,917	3,080	U
74	603790	NATO Research and Development	4			9,933	U
42	603528	Non-Acoustic ASW	4		9,689		U
62	603713	Ocean Engineering Development	4	14,047	4,982	8,606	U
41	603525	Pilot Fish	4	33,722	75,333	93,910	U
44	603542	Radiological Control	4	3,442	3,104	2,886	U
69	603751	Retract Elm	4	39,825	30,411	24,993	U
43	603536	Retract Juniper	4	19,650	9,688	10,398	U
67	603746	Retract Maple	4	99,891	85,024	83,809	U
77	604707	SEW Architecture/Eng Support	4	5,941	5,468	5,212	U
39	603513	Shipboard System Component Dev	4	25,640	16,280	9,948	U
40	603514	Ship Combat Survivability	4	14,149	11,288	5,749	U
48	603563	Ship Concept Advanced Design	4	28,484	52,044	13,807	U

Exhibit R-1

APPROPRIATION: 1319n

Department of the Navy

Research, Development, Test, and Evaluation, Navy

March 1996

--- Alphabetic Listing ---

In Thousands of Dollars

P-1 NUMBER	PROGRAM ELEMENT	PROGRAM NAME	BA	FY 1995	FY 1996	FY 1997	C
49	603564	Ship Prelim Design & Feasibility Studies	4	30,311	9,210	12,942	U
70	603755	Ship Self Defense	4	229,634	316,446	216,486	U
73	603787	Special Processes	4	32,301	69,975	82,764	U
47	603562	Submarine Tactical Warfare Sys	4	7,221	4,794	4,578	U
45	603553	Surface ASW	4	6,469	6,441	3,964	U
35	603502	Surface & Shallow Water Mine Countermeasures	4	43,734	54,367	86,995	U
37	603506	Surface Ship Torpedo Defense	4	20,353	9,714	5,772	U
32	603261	Tactical Airborne Reconnaissance	4	43,704	20,214	24,085	U
34	603451	Tactical Space Operations	4	2,002	933		U
29	603208	Training System Aircraft	4	4,310	2,977	2,405	U
71	603763	Warfare Systems Archit & Engineering	4	9,075			U

* = These programs contained classified materials and are printed in a separate justification back up book.

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Identification code 17-1319-0-1-051	Budget Plan (amounts for RESEARCH, DEV, TEST & EVAL actions programed)			Obligations		
	1995 actual	1996 est.	1997 est.	1995 actual	1996 est.	1997 est.
Program by activities:						
Direct program:						
00.0101 Basic research	408,284	378,929	387,213	406,660	375,172	387,416
00.0201 Applied Research	501,603	543,779	463,465	473,049	570,544	467,424
00.0301 Advanced technology development	481,104	482,865	449,342	461,935	554,524	467,017
00.0401 Demonstration/validation	1,582,957	1,727,209	1,740,955	1,657,137	1,616,331	1,711,012
00.0501 Engineering and manufacturing development	2,213,031	2,405,727	2,048,657	2,270,420	2,425,974	2,091,636
00.0601 Management support	776,356	575,396	558,440	794,005	620,237	560,953
00.0701 Operational system development	2,642,982	2,380,629	1,686,662	2,717,856	2,383,169	1,718,864
00.9101 Total direct program	8,606,317	8,494,534	7,334,734	8,781,062	8,545,951	7,404,322
01.0101 Reimbursable program	111,669	110,000	110,000	122,142	113,659	110,000
10.0001 Total	8,717,986	8,604,534	7,444,734	8,903,204	8,659,610	7,514,322
Financing:						
Offsetting collections from:						
11.0001 Federal funds(-)	-109,801	-110,000	-110,000	-113,237	-110,000	-110,000
13.0001 Trust funds(-)	-128			-133		
14.0001 Non-Federal sources(-)	-1,740			-1,876		
17.0001 Recovery of prior year obligations				-3,023		
Unobligated balance available, start of year:						
21.4002 For completion of prior year budget plans				-758,455	-568,848	-516,272
21.4003 Available to finance new budget plans	-60,902	-11,600		-60,902	-11,600	
21.4009 Reprograming from/to prior year budget plan	-10,989	2,500				
22.0001 Unobligated balance transferred to other acco	18,202	-2,500		18,202	-2,500	
Unobligated balance available, end of year:						
24.4002 For completion of prior year budget plans				568,848	516,272	446,684
24.4003 Available to finance subsequent year budget	11,600			11,600		
25.0001 Unobligated balance expiring	9,489			9,489		
39.0001 Budget authority	8,573,717	8,482,934	7,334,734	8,573,717	8,482,934	7,334,734
Budget authority:						
40.0001 Appropriation	8,627,917	8,573,073	7,334,734	8,627,917	8,573,073	7,334,734
40.3601 Appropriation rescinded (unob bal)		-6,000			-6,000	
41.0001 Transferred to other accounts (-)	-54,200	-84,139		-54,200	-84,139	
43.0001 Appropriation (adjusted)	8,573,717	8,482,934	7,334,734	8,573,717	8,482,934	7,334,734

Identification code 17-1319-0-1-051	Budget Plan (amounts for RESEARCH, DEV, TEST & EVAL actions programed)			Obligations		
	1995 actual	1996 est.	1997 est.	1995 actual	1996 est.	1997 est.
Relation of obligations to outlays:						
71.0001 Obligations incurred				8,787,958	8,549,610	7,404,322
72.1001 Orders on hand, SOY				-169,682	-142,908	
72.4001 Obligated balance, start of year				5,751,294	5,155,440	5,165,061
74.1001 Orders on hand, EOY				142,908		
74.4001 Obligated balance, end of year				-5,155,440	-5,165,061	-4,805,235
77.0001 Adjustments in expired accounts (net)				-124,371		
78.0001 Adjustments in unexpired accounts				-3,023		
90.0001 Outlays (net)				9,229,644	8,397,081	7,764,148

Identification code 17-1319-0-1-051		1995 actual	1996 est.	1997 est.
	Direct obligations:			
	Personnel compensation:			
111.101	Full-time permanent	44,885	45,286	44,835
111.301	Other than full-time permanent	3,717	3,418	3,489
111.501	Other personnel compensation	1,646	1,574	1,558
111.901	Total personnel compensation	50,248	50,278	49,882
112.101	Personnel Benefits: Civilian personnel	9,205	10,176	10,146
113.001	Benefits for former personnel	698	150	150
121.001	Travel and transportation of persons	20,463	21,567	21,938
122.001	Transportation of things	2,136	2,131	2,097
123.301	Communications, utilities, and miscellaneous charges	8,619	8,878	9,144
124.001	Printing and reproduction	724	746	768
125.101	Advisory and assistance services	247,371	276,867	263,316
125.201	Other services with the private sector	5,490,346	5,440,405	4,358,087
	Purchases goods/services (inter/intra) Fed accounts			
125.301	Purchase of goods/services from other Fed agencies	252,858	236,570	226,565
125.302	Payments to foreign national indirect hire personnel	42	20	
125.303	Purchases from revolving funds	2,409,912	2,210,890	2,174,269
126.001	Supplies and materials	17,665	18,194	18,740
131.001	Equipment	15,794	16,268	16,756
132.001	Land and structures	2,905	2,900	2,900
141.001	Grants, subsidies, and contributions	252,076	249,911	249,564
199.001	Total Direct obligations	8,781,062	8,545,951	7,404,322
	Reimbursable obligations:			
	Personnel Compensation:			
211.101	Full-time permanent	32,453	33,454	41,583
211.301	Other than full-time permanent	2,738	868	2,698
211.501	Other personnel compensation	676	673	775
211.901	Total personnel compensation	35,867	34,995	45,056
212.101	Personnel Benefits: Civilian Personnel	6,835	7,138	8,624
221.001	Travel and transportation of persons	2,487	2,750	2,475
222.001	Transportation of things	101	100	100
223.301	Communications, utilities, and miscellaneous charges	1,637	1,635	1,630
224.001	Printing and reproduction	155	150	148
225.201	Other services with the private sector	37,959	26,766	15,882
	Purchases goods/services (inter/intra) Fed accounts			
225.303	Purchases from revolving funds	13,900	17,125	13,090
226.001	Supplies and materials	13,109	13,000	12,990
231.001	Equipment	8,592	8,490	8,480

Identification code 17-1319-0-1-051	1995 actual	1996 est.	1997 est.
241.001 Grants, subsidies, and contributions	1,500	1,510	1,525
299.001 Total Reimbursable obligations	122,142	113,659	110,000
999.901 Total obligations	8,903,204	8,659,610	7,514,322

Program and Financing (in Thousands of dollars) SUPPLEMENTAL

Identification code 17-1319-5-1-051	Budget Plan (amounts for RESEARCH, DEV, TEST & EVAL actions programed) 1995 actual	1996 est.	1997 est.	Obligations 1995 actual	1996 est.	1997 est.
Program by activities:						
Direct program:						
00.0101 Basic research		-1,917			-1,801	-116
00.0201 Applied Research		-2,407			-2,262	-145
00.0301 Advanced technology development		-38,135			-35,214	-2,921
00.0401 Demonstration/validation		-10,597			-10,597	
00.0501 Engineering and manufacturing development		-9,912			-9,317	-595
00.0601 Management support		-2,015			-1,894	-121
00.0701 Operational system development		-9,817			-9,227	-590
10.0001 Total		-74,800			-70,312	-4,488
Financing:						
Unobligated balance available, start of year:						
21.4002 For completion of prior year budget plans						4,488
Unobligated balance available, end of year:						
24.4002 For completion of prior year budget plans					-4,488	
40.3501 Budget authority (Appropriation rescinded) (		-74,800			-74,800	
Relation of obligations to outlays:						
71.0001 Obligations incurred					-70,312	-4,488
72.4001 Obligated balance, start of year						-28,499
74.4001 Obligated balance, end of year					28,499	9,425
90.0001 Outlays (net)					-41,813	-23,562

Identification code 17-1319-5-1-051		1995 actual	1996 est.	1997 est.
	Direct obligations:			
125.201	Other services with the private sector		-70,312	-4,488
199.001	Total Direct obligations		-70,312	-4,488
999.901	Total obligations		-70,312	-4,488

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: MARCH 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603207N
PROGRAM ELEMENT TITLE: Air/Ocean Tactical Application

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ACTUAL	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
R0118 Ocean Measurement Sensors	2,751	2,848	3,212	3,215	4,942	5,003	5,064	CONT.	CONT.
X0513 Air/Ocean Prediction	1,506	1,474	1,764	1,739	2,034	2,031	2,068	CONT.	CONT.
X0514 Air/Ocean Shipboard Measurements	1,765	1,927	1,557	1,814	2,134	2,231	2,280	CONT.	CONT.
X0523 Air/Ocean Data Assimilation	814	772	751	777	939	937	958	CONT.	CONT.
X0948 Precise Timing and Astrometry	1,406	1,241	1,236	1,248	1,504	1,504	1,540	CONT.	CONT.
X1596 Satellite Ocean Tactical Application	4,303	3,796	3,858	4,081	4,748	4,649	4,874	CONT.	CONT.
R1987 Mapping, Charting and Geodesy Techniques	1,633	5,095	2,075	2,143	2,250	2,248	2,298	CONT.	CONT.
X2008 Tactical Ocean Data Assimilation and Prediction	2,331	2,061	2,066	2,012	2,438	2,435	2,489	CONT.	CONT.
TOTAL	16,509	19,214	16,519	17,029	20,989	21,038	21,571	CONT.	CONT.

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: Increases capabilities of shipboard meteorology and oceanography support to tactically optimize weapon, sensor and platform performance in highly variable oceanic and atmospheric conditions. Projects in this program element develop atmospheric and oceanic data assimilation techniques, forecast models, data base management systems and associated software for use in both mainframe and tactical scale computers afloat. Also developed are algorithms to process remotely sensed satellite data for integration into other systems and tactical applications.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: MARCH 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603207N
PROGRAM ELEMENT TITLE: Air/Ocean Tactical Application

The projects also provide for advanced development of specialized oceanographic instrumentation and techniques to measure ocean parameters, new sensors, communications, interface, and precise time technologies. Mapping, Charting and Geodesy efforts address the bathymetric and gravimetric needs of the Navy.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under DEMONSTRATION & VALIDATION because it develops and integrates hardware for experimental test related to specific ship or aircraft applications.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

Date: MARCH 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603207N PROJECT NUMBER: R0118
PROGRAM ELEMENT TITLE: Air/Ocean Tactical Applications PROJECT TITLE: Ocean Measurement Sensors

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ACTUAL	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
R0118 Ocean Measurement Sensors	2,751	2,848	3,212	3,215	4,942	5,003	5,064	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: R0118, Ocean Measurement Sensors: The project develops highly specialized ultra-high resolution instrumentation systems and measurement techniques in support of CNO-endorsed requirements. The objectives of this project are to develop rapid meteorology and oceanography (METOC) data collection methods for littoral and hinterland regions to 1) provide an in-situ assessment capability for combatants, 2) to provide the regional commander with continuous METOC data for operational use, 3) develop baseline data for predictive models in areas of potential interest. Climatological forecasting does not work in the littoral. The major challenges include collection and dissemination of data in highly variable meteorological and oceanographic conditions under stressful METOC situations in denied or inaccessible areas over relatively long periods of time.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS:

- (U) ($280) Completed Tactical Oceanographic Monitoring System Test and Evaluation. Established classification levels of data bases within the Naval Oceanographic Office. Transition Program to N872.
- (U) ($50) Evaluated "Over the Horizon" (OTH) radar approach to measuring near shore wave and current conditions directly from assault ships.
- (U) ($245) Initiated miniature integrated real-time dropsonde package for Joint Navy/Army Unmanned Air Vehicle (UAV) project.
- (U) ($498) Completed development of real-time data collection capability for grey ships.
- (U) ($250) Completed expendable wave buoy development in support of amphibious operations.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

Date: MARCH 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603207N PROJECT NUMBER: R0118
PROGRAM ELEMENT TITLE: Air/Ocean Tactical Applications PROJECT TITLE: Ocean Measurement Sensors

- (U) ($611) Completed Navy/NOAA/NASA optical sensor development in preparation for FY96 SeaWiFS launch.
- (U) ($245) Completed and demonstrated clandestine buoy transmitter development.
- (U) ($302) Continued sensor suite for atmospheric Electro-Optical (E-O) propagation.
- (U) ($270) Initiated wind speed and direction sensor for expendable buoy.

2. (U) FY 1996 ACTUALS:

- (U) ($1,000) Initiate development of METOC sensor packages for Remotely Operated Vehicle / Autonomous Unmanned Vehicles (ROV/AUVs) and fleet strike aircraft to support joint littoral operations.
- (U) ($650) Continue miniature dropsonde package for Joint Navy/Army Unmanned Air Vehicle (UAV) project/integrate atmospheric E-O sensors.
- (U) ($583) Initiate hinterland clandestine system and sensors for METOC monitoring for joint operations.
- (U) ($289) Initiate Budget Activity (BA) 6.4 transition of expendable mooring system from BA 6.2 Ocean Sensors project.
- (U) ($244) Transition miniature Acoustic Doppler Current Profiler (ADCP) development on Covert Littoral Acoustic Mapper (CLAM) to buoy mounted sensor.
- (U) ($82) Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15 U.S.C. 638.

3. (U) FY 1997 PLAN:

- (U) ($638) Initiate Airborne Combat Data Collection (CDC) capability to support Battlespace METOC data acquisition.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

Date: MARCH 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603207N PROJECT NUMBER: R0118
PROGRAM ELEMENT TITLE: Air/Ocean Tactical Applications PROJECT TITLE: Ocean Measurement Sensors

- (U) ($779) Continue sensors developments for ROV/AUV and fleet strike aircraft projects.
- (U) ($580) Continue sensor integration and development of UAV sensors for joint littoral operations.
- (U) ($525) Continue hinterland clandestine micro system for METOC monitoring for joint operations
- (U) ($389) Continue development of miniature ADCP for buoys.
- (U) ($301) Continue A-sized expendable mooring development.

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996/97 President's Budget:	2,751	3,002	2,974
(U) Adjustments from PRESBUDG:	0	-154	+238
(U) FY 1997 President's Budget Submit:	2,751	2,848	3,212

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1996: Congressional undistributed general and inflation reductions (-$121K); and revised DOD inflation rates and other minor pricing adjustments (-$33K). FY 1997: Revised inflation estimates and other minor pricing adjustments (+$238K).

(U) Schedule: Not applicable.

(U) Technical: Directed by sponsor to support Airborne CDC initiatives vice over-the-horizon radar and increase the capabilities of UAV micro weather sensors.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

Date: MARCH 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603207N PROJECT NUMBER: R0118
PROGRAM ELEMENT TITLE: Air/Ocean Tactical Applications PROJECT TITLE: Ocean Measurement Sensors

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

(U) RELATED RDT&E: PE 0101224N (SSBN Security and Survivability Program)
PE 0604218N (Air/Ocean Equipment Engineering)

D. (U) SCHEDULE PROFILE: Not Applicable

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

Date: MARCH 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603207N PROJECT NUMBER: R0118
PROGRAM ELEMENT TITLE: Air/Ocean Tactical Applications PROJECT TITLE: Ocean Measurement Sensors

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

Project Cost Categories	FY 1995	FY 1996	FY 1997
a. Primary Hardware Development	2,726	2,820	3,182
b. Travel	25	28	30
Total	2,751	2,848	3,212

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 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Product Development										
NRL	WX	N/A	CONT.	CONT.	19,058	2,751	2,848	3,212	CONT.	CONT.
Support and Management										
Test and Evaluation										

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

Date: MARCH 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603207N PROJECT NUMBER: R0118
PROGRAM ELEMENT TITLE: Air/Ocean Tactical Applications PROJECT TITLE: Ocean Measurement Sensors

GOVERNMENT FURNISHED PROPERTY

Item Description	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Delivery Date	Total FY 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Product Development									
Support and Management									
Test and Evaluation									
Subtotal Product Development				2,858	2,751	2,848	3,212	CONT.	CONT.
Subtotal Support and Management									
Subtotal Test and Evaluation									
Total Project				2,858	2,751	2,848	3,212	CONT.	CONT.

C. (U) Funding Profile: NON APPLICABLE

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

Date: MARCH 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603207N PROJECT NUMBER: X0513
PROGRAM ELEMENT TITLE: Air/Ocean Tactical Applications PROJECT TITLE: Air/Ocean Prediction

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ACTUAL	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
X0513 Air/Ocean Prediction	1,506	1,474	1,764	1,739	2,034	2,031	2,068	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project develops numerical oceanographic and atmospheric models for the Navy's Large Scale Computers at the Fleet Numerical Meteorology and Oceanography Center, Monterey, CA and the Naval Oceanographic Office, Stennis Space Center, MS. Other models under development in this project focus on sea ice, ocean thermal structure and ocean circulation prediction. In addition, the project develops expert systems/artificial intelligence applications which utilize the model output data to afford decision makers a better understanding of operational limitations imposed by the environment.

(U) PROGRAM ACCOMPLISMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS:

- (U) ($243) Completed development and transition of upgraded tropical cyclone forecasting expert system.
- (U) ($402) Continued development of a tactical scale nested atmospheric forecast model.
- (U) ($393) Completed development of Northern Hemisphere Pacific ocean circulation model and began transition to operational use.
- (U) ($468) Continued development of the next generation NOGAPS. Began development of global coupled air-ocean-ice model which exploits next generation computer technology.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

Date: MARCH 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603207N PROJECT NUMBER: X0513
PROGRAM ELEMENT TITLE: Air/Ocean Tactical Applications PROJECT TITLE: Air/Ocean Prediction

2. (U) FY 1996 PLAN:40

- (U) ($3) Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15 U.S.C.638.
- (U) ($467) Deliver next generation NOGAPS for operational use.
- (U) ($170) Begin development of advanced aerosol model.
- (U) ($350) Complete development of and transition tactical scale nested atmospheric forecast model to large scale computer.
- (U) ($484) Continue development of global coupled air-ocean-ice model.

3. (U) FY 1997 PLAN:

- (U) ($395) Begin Massively Parallel Processor (MPP) version of NOGAPS.
- (U) ($227) Continue development of advanced aerosol model.
- (U) ($669) Begin development of shipboard version of tactical scale nested model.
- (U) ($473) Deliver global coupled air-ocean-ice model for operational use.

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996/97 President's Budget:	1,506	1,520	1,429
(U) Adjustments from PRESBUDG:		-46	+335
(U) FY 1997 President's Budget Submit:	1,506	1,474	1,764

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

Date: MARCH 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603207N PROJECT NUMBER: X0513
PROGRAM ELEMENT TITLE: Air/Ocean Tactical Applications PROJECT TITLE: Air/Ocean Prediction

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1996: Congressional undistributed general and inflation reductions (-$29K); and revised DOD inflation rates and other minor pricing adjustments (-$17K). FY 1997: Revised inflation estimates and other minor pricing adjustments (+$335K).

(U) Schedule: Delivers shipboard tactical forecast capability two years earlier.

(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 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

Date: MARCH 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603207N PROJECT NUMBER: X0513
PROGRAM ELEMENT TITLE: Air/Ocean Tactical Applications PROJECT TITLE: Air/Ocean Prediction

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

Project Cost Categories	FY 1995	FY 1996	FY 1997
a. Software Development	1,481	1,449	1,739
b. Travel	25	25	25
Total	1,506	1,474	1,764

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 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Product Development										
NRL	WX	N/A	CONT.	CONT.	8,756	1,506	1,474	1,764	CONT.	CONT.
Support and Management										
Test and Evaluation										

GOVERNMENT FURNISHED PROPERTY

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

Date: MARCH 1996

BUDGET ACTIVITY: 4
PROGRAM ELEMENT: 0603207N
PROGRAM ELEMENT TITLE: Air/Ocean Tactical Applications
PROJECT NUMBER: X0513
PROJECT TITLE: Air/Ocean Prediction

Item Description	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Delivery Date	Total FY 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Product Development									
Support and Management									
Test and Evaluation									

	Total FY 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Subtotal Product Development	8,756	1,506	1,474	1,764	CONT.	CONT.
Subtotal Support and Management						
Subtotal Test and Evaluation						
Total Project	8,756	1,506	1,474	1,764	CONT.	CONT.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

Date: MARCH 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603207N PROJECT NUMBER: X0514
PROGRAM ELEMENT TITLE: Air/Ocean Tactical Applications PROJECT TITLE: Air/Ocean Shipboard Measurements

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ACTUAL	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
X0514 Air/Ocean Shipboard Measurements	1,765	1,927	1,557	1,814	2,134	2,231	2,280	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project provides for the advanced development of sensors, communication interfaces, and processing and display equipment to measure, ingest, store, distribute and display atmospheric and oceanographic parameters. Major emphasis areas include tactical workstations, data compression, connectivity, interface technology and the advanced development of new sensors such as active and passive atmospheric profilers for the Shipboard Meteorological and Oceanographic Observing System (SMOOS).

(U) PROGRAM ACCOMPLISMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS:

- (U) ($707) Demonstrated advanced development of data connectivity with the TAMPS, C2 systems, Tomahawk and other strike warfare systems. Continued development of data connectivity and interfaces with other C2 systems.
- (U) ($300) Continued advanced development of data compression techniques.
- (U) ($250) Delivered data visualization software for transition.
- (U) ($508) Continued advanced development of additional SMOOS sensors and an autonomous sensor suite for small ships such as the Cyclone Class Patrol Craft (PC).

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

Date: MARCH 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603207N PROJECT NUMBER: X0514
PROGRAM ELEMENT TITLE: Air/Ocean Tactical Applications PROJECT TITLE: Air/Ocean Shipboard Measurements

2. (U) FY 1996 PLAN:

- (U) ($17) Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15 U.S.C.638.
- (U) ($650) Complete data connectivity with the TAMPS, Tomahawk and other strike warfare systems. Continue development of data connectivity and interfaces with other C2 systems.
- (U) ($300) Complete development and deliver Basis Image data compression technique. Continue development of additional data compression techniques.
- (U) ($250) Establish Advanced Data Visualization Laboratory (ADVL) at the Naval Research Lab (NRL). Begin development of stereoscopic, holographic and dynamic data visualization methods.
- (U) ($389) Complete advanced development of the autonomous sensor suite for small ships. Continue development of additional SMOOS sensors such as a LIDAR wind profiler, an Infrared (IR) extinction sensor and a hull mounted sea surface temperature sensor.
- (U) ($321) Begin Test and Evaluation of Non-development items in support of data connectivity, visualization, interfaces and C2 systems.

3. (U) FY 1997 PLAN:

- (U) ($457) Complete data connectivity with the AEGIS C2 system. Continue development of data connectivity and interfaces with other C2 systems.
- (U) ($300) Continue Test and Evaluation of Non-developmental items in support of data connectivity, visualization, interfaces and C2 systems.
- (U) ($150) Complete development and deliver Fractal data compression technique. Continue development of additional data compression techniques.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

Date: MARCH 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603207N PROGRAM ELEMENT TITLE: Air/Ocean Tactical Applications PROJECT NUMBER: X0514 PROJECT TITLE: Air/Ocean Shipboard Measurements

- (U) ($250) Transition stereoscopic data visualization software. Continue development of holographic and dynamic data visualization methods.
- (U) ($400) Complete development of the SMOOS LIDAR wind profiler. Continue development of additional SMOOS sensors.

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996/97 President's Budget:	1,766	1,987	1,696
(U) Adjustments from PRESBUDG:	-1	-60	-139
(U) FY 1997 President's Budget Submit:	1,765	1,927	1,557

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1995: Decrease of $1K reprogrammed to cover fact of life adjustments in other Navy programs. FY 1996: Congressional undistributed general and inflation reductions (-$38K); and revised DOD inflation rates and other minor pricing adjustments (-$22K). FY 1997: Revised inflation estimates and other minor pricing adjustments (-$139K).

(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). Provides for transition to engineering development.

D. (U) SCHEDULE PROFILE: Not applicable.

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

Date: MARCH 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603207N
PROGRAM ELEMENT TITLE: Air/Ocean Tactical Applications

PROJECT NUMBER: X0514
PROJECT TITLE: Air/Ocean Shipboard Measurements

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

Project Cost Categories	FY 1995	FY 1996	FY 1997
a. Sensor Development	500	450	350
b. Software Development	900	1,112	792
c. Contactor Engineering Support	350	350	400
d. Travel	15	15	15
Total	1,765	1,927	1,557

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION ($ in thousands) Not applicable.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

Date: MARCH 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603207N PROJECT NUMBER: X0523
PROGRAM ELEMENT TITLE: Air/Ocean Tactical Applications PROJECT TITLE: Air/Ocean Data Assimilation

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ACTUAL	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
X0523 Air/Ocean Data Assimilation	814	772	751	777	939	937	958	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project develops systems and associated software to process and manage remotely-sensed environmental data at Oceanography Centers ashore and on board ships equipped with the AN/SMQ-11 satellite receiver/recorder. The project also supports code conversion, rehosting of software from other sources and modifications to the Tactical Environmental Support System - TESS(3) - Data Base Management System (DBMS).

(U) PROGRAM ACCOMPLISMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS:

- (U) ($370) Completed development of capability to ingest data into environmental data bases from satellite radar altimeters; continued development of capabilities to ingest data from other new satellite sensors such as Special Microwave Imagers and Synthetic Aperture Radars.
- (U) ($225) Continued modifications to TESS(3) DBMS to accommodate increased capabilities afforded with new hardware and systems software.
- (U) ($219) Began exploitation of new relational data base management technologies for large scale computers and TESS(3).

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

Date: MARCH 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603207N PROJECT NUMBER: X0523
PROGRAM ELEMENT TITLE: Air/Ocean Tactical Applications PROJECT TITLE: Air/Ocean Data Assimilation

2. (U) FY 1996 PLAN:

- (U) ($9) Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15 U.S.C.638.
- (U) ($200) Complete development of capability to ingest data from Special Microwave Imagers and Synthetic Aperture Radars. Begin development of capabilities to ingest data from other new satellite sensors such as Ocean Color and Vertical Sounders.
- (U) ($271) Complete modifications to TESS(3) DBMS to accomodate increased capabilities afforded with new hardware and systems software.
- (U) ($150) Continue exploitation of new relational data base management technologies for large scale computers and TESS(3).
- (U) ($142) Begin development of object-oriented DBMS.

3. (U) FY 1997 PLAN:

- (U) ($212) Continue development of capabilities to ingest data from other new satellite sensors such as ocean color and altimeters
- (U) ($239) Transition relational data base management technologies for large scale computers and TESS(3).
- (U) ($300) Continue development of object-oriented DBMS.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

Date: MARCH 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603207N PROJECT NUMBER: X0523
PROGRAM ELEMENT TITLE: Air/Ocean Tactical Applications PROJECT TITLE: Air/Ocean Data Assimilation

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996/97 President's Budget:	814	795	777
(U) Adjustments from PRESBUDG:		-23	-26
(U) FY 1997 President's Budget Submit:	814	772	751

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1996: Congressional undistributed general and inflation reductions (-$15K); and revised DOD inflation rates and other minor pricing adjustments (-$8K). FY 1997: Revised inflation estimates and other minor pricing adjustments (-$26K).

(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). Provides engineering development for AN/SMQ-11, TESS(3) and other related systems.

D. (U) SCHEDULE PROFILE: Not applicable.

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

Date: MARCH 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603207N PROJECT NUMBER: X0523
PROGRAM ELEMENT TITLE: Air/Ocean Tactical Applications PROJECT TITLE: Air/Ocean Data Assimilation

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

Project Cost Categories	FY 1995	FY 1996	FY 1997
a. Software Development	814	772	751
Total	814	772	751

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 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Product Development										
Various	Various		CONT.	CONT.	5,528	814	772	751	CONT.	CONT.
Support and Management										
Test and Evaluation										

GOVERNMENT FURNISHED PROPERTY

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

Date: MARCH 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603207N PROJECT NUMBER: X0523
PROGRAM ELEMENT TITLE: Air/Ocean Tactical Applications PROJECT TITLE: Air/Ocean Data Assimilation

Item Description	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Delivery Date	Total FY 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Product Development									
Support and Management									
Test and Evaluation									

	Total FY 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Subtotal Product Development	5,528	814	772	751	CONT.	CONT.
Subtotal Support and Management						
Subtotal Test and Evaluation						
Total Project	5,528	814	772	751	CONT.	CONT.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

Date: MARCH 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603207N PROJECT NUMBER: X0948
PROGRAM ELEMENT TITLE: Air/Ocean Tactical Applications PROJECT TITLE: Precise Timing & Astrometry

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ACTUAL	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
X0948 Precise Timing and Astrometry	1,406	1,241	1,236	1,248	1,504	1,504	1,540	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project upgrades the accuracy of the U.S. Naval Observatory's Master Clock System (MCS) for DOD surface, subsurface, air and shore communications, navigation and time dissemination systems. It also develops near-real-time Earth orientation predictions through use of satellite or fiber optics transmission of Very Long Baseline Interferometer (VLBI) data for DOD navigation and positioning systems. It also develops advanced electronic light detectors and interferometry in the optical and infrared wavelength regions for very precise determination of positions of both faint and bright star, satellite tracking, and space debris studies.

(U) PROGRAM ACCOMPLISMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS:

- (U) ($150) Evaluated improved stored ion clock physics package.
- (U) ($100) Verified Clock Environment Behavior Models (CEBM) and tested new CEBM time scale algorithm.
- (U) ($422) Started Infrared development for optical interferometer.
- (U) ($534) Constructed large-scale CCD arrays for electronic astrography.
- (U) ($200) Evaluated VLBI fiber optics vs. satellite data transfer and designed final VLBI data transfer system.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

Date: MARCH 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603207N PROJECT NUMBER: X0948
PROGRAM ELEMENT TITLE: Air/Ocean Tactical Applications PROJECT TITLE: Precise Timing & Astrometry

2. (U) FY 1996 PLAN:

- (U) ($150) Demonstrate optimum clock stability and precision at the nanosecond level from application of more accurate environmental stability and clock model algorithms.
- (U) ($150) Complete evaluation of stored ion clock physics package.
- (U) ($350) Demonstrate the capability of optical interferometry for precise positions.
- (U) ($391) Initiate demonstration of large scale CCD arrays for electronic astrography.
- (U) ($200) Continue development of infrared capability for optical interferometer.

3. (U) FY 1997 PLAN:

- (U) ($100) Evaluate time transfer capabilities via fiber optic network.
- (U) ($150) Demonstrate capabilities of the Global Positioning System (GPS) for UTI/Polar Motion determination.
- (U) ($400) Complete demonstration of prototype optical interferometer for astrometry.
- (U) ($336) Complete demonstration of large scale CCD arrays for electronic astrography.
- (U) ($250) Complete development of infrared capability for optical interferometer.

B.(U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996/97 President's Budget:	1,408	1,280	1,273
(U) Adjustments from PRESBUDG:	-2	-39	-37
(U) FY 1997 President's Budget Submit:	1,406	1,241	1,236

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

Date: MARCH 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603207N PROJECT NUMBER: X0948
PROGRAM ELEMENT TITLE: Air/Ocean Tactical Applications PROJECT TITLE: Precise Timing & Astrometry

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1995: Decrease of $2K reprogrammed to cover fact of life adjustments in other Navy Programs. FY 1996: Congressional undistributed general and inflation reductions (-$25K); and revised DOD inflation rates and other minor pricing adjustments (-$14K). FY 1997: Revised inflation estimates and other minor pricing adjustments (-$37K).

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

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

(U) RELATED RDT&E: PE 0602435N, Project RM35G83, Astronomy, exploratory development in general areas covered in this summary, many projects transition to PE 0603207N. Initial research in clock steering algorithms, VLBI - related atmospheric studies, and exploratory research into various methods of observing faint stars and developing star catalogs is performed under this related activity.

D. (U) SCHEDULE PROFILE: Not applicable.

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

Date: MARCH 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603207N PROJECT NUMBER: X0948
PROGRAM ELEMENT TITLE: Air/Ocean Tactical Applications PROJECT TITLE: Precise Timing & Astrometry

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

Project Cost Categories	FY 1995	FY 1996	FY 1997
a. Software Development	1,406	1,241	1,236
Total	1,406	1,241	1,236

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

Date: MARCH 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603207N PROGRAM ELEMENT TITLE: Air/Ocean Tactical Applications PROJECT NUMBER: X1596 PROJECT TITLE: Satellite Ocean Tactical Application

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ACTUAL	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
X1596 Satellite Ocean Tactical Application	4,303	3,796	3,858	4,081	4,748	4,649	4,874	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project develops concepts and software techniques for the integration and tactical application of significant oceanographic and atmospheric data derived from satellite-borne sensors. Included are techniques and algorithms for the processing of sensor measurements, conversion of raw signal data to geophysical information, analysis schemes encompassing Artificial Intelligence and Expert Systems, and other satellite data applications and field validation of end products. The software developed under this project is planned for use in Mainframe computers and in the Tactical Environmental Support System - TESS(3).

(U) PROGRAM ACCOMPLISMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS:

- (U) ($1,807) Began transition of a cloud pattern recognition expert system. Continued development of additional expert systems for satellite oceanographic and atmospheric feature analyses.
- (U) ($1,821) Completed transition of SAR operational capability and continue transition of ocean color sensor and scatterometer data operational capability. Continued development of new algorithms for SAR, altimeters, ocean color sensors and scatterometers.
- (U) ($375) Completed development of prototype littoral zone analysis software.
- (U) ($300) Continued Fleet Exercise participation for validation of algorithms.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

Date: MARCH 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603207N PROJECT NUMBER: X1596
PROGRAM ELEMENT TITLE: Air/Ocean Tactical Applications PROJECT TITLE: Satellite Ocean Tactical Application

2. (U) FY 1996 PLAN:

- (U) ($14) Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15 U.S.C.638.
- (U) ($1,405) Complete transition of a cloud pattern recognition expert system. Continue development of additional expert systems for satellite oceanographic and atmospheric feature analyses.
- (U) ($1,702) Continue transition of ocean color sensor and scatterometer data operational capability. Continue development of new algorithms for SAR, altimeters, ocean color sensors and scatterometers.
- (U) ($375) Begin development of advanced littoral zone analysis software.
- (U) ($300) Continue fleet exercise participation for validation of algorithms.

3. (U) FY 1997 PLAN:

- (U) ($1,422) Complete Expert System for atmospheric fronts and cumulus cloud analysis. Continue development of additional expert systems for satellite oceanographic and atmospheric feature analyses.
- (U) ($1,596) Continue transition of ocean color sensor and scatterometer data operational capability. Continue development of new algorithms for SAR, Altimeters, Ocean Color sensors and scatterometers.
- (U) ($375) Continue development of advanced littoral zone analysis software.
- (U) ($165) Begin airborne vs. satellite validation of SAR ocean feature analysis.
- (U) ($300) Continue fleet exercise participation for validation of algorithms.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

Date: MARCH 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603207N
PROGRAM ELEMENT TITLE: Air/Ocean Tactical Applications

PROJECT NUMBER: X1596
PROJECT TITLE: Satellite Ocean Tactical Application

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996/97 President's Budget:	4,303	3,918	4,076
(U) Adjustments from PRESBUDG:		-122	-218
(U) FY 1997 President's Budget Submit:	4,303	3,796	3,858

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1996: Congressional undistributed general and inflation reductions (-$77K); and revised DOD inflation rates and other minor pricing adjustments (-$45K). FY 1997: Revised inflation estimates and other minor pricing adjustments (-$218K).

(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 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

Date: MARCH 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603207N PROGRAM ELEMENT TITLE: Air/Ocean Tactical Applications PROJECT NUMBER: X1596 PROJECT TITLE: Satellite Ocean Tactical Application

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

Project Cost Categories	FY 1995	FY 1996	FY 1997
a. Software Development	4,303	3,796	3,858
Total	4,303	3,796	3,858

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 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Product Development										
Various	Various		N/A	N/A	29,477	4,303	3,796	3,858	CONT.	CONT.
Support and Management										
Test and Evaluation										

GOVERNMENT FURNISHED PROPERTY

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

Date: MARCH 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603207N PROGRAM ELEMENT TITLE: Air/Ocean Tactical Applications PROJECT NUMBER: X1596 PROJECT TITLE: Satellite Ocean Tactical Application

Item Description	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Delivery Date	Total FY 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Product Development									
Support and Management									
Test and Evaluation									
Subtotal Product Development				29,477	4,303	3,796	3,858	CONT.	CONT.
Subtotal Support and Management									
Subtotal Test and Evaluation									
Total Project				29,477	4,303	3,796	3,858	CONT.	CONT.

C. (U) FUNDING PROFILE: Not Applicable

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

Date: MARCH 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603207N PROJECT NUMBER: R1987
PROGRAM ELEMENT TITLE: Air/Ocean Tactical Applications PROJECT TITLE: Mapping, Charting & Geodesy Techniques

(U) COST (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ACTUAL	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
R1987 Mapping, Charting & Geodesy Techniques	1,633	5,095	2,075	2,143	2,250	2,248	2,298	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: R1987, Mapping, charting & Geodesy Techniques: This project develops new charting and bathymetric survey techniques necessary to reduce the existing 300 ship year shortfall in coastal hydrographic survey requirements. Presently 70% of the world's coastline is not adequately charted. The requirements are originated by Fleet Commander in Chief's (CINCS) and the Commandant of the Marine Corps, and validated by the Defense Mapping Agency in support of littoral and expeditionary operations.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS:

- (U) ($500) Continued digital MC&G evaluation and collection of data for weapons systems input.
- (U) ($508) Continued development of near shore bathymetric data collection via remotely controlled vehicle.
- (U) ($100) Completed and demonstrated Clandestine Littoral Acoustic Mapper (CLAM) to special forces as requested.
- (U) ($276) Established specifications for fixed wing laser bathymetry system for navy purchase, prepared sensors and test ranges for evaluation and optimization.
- (U) ($249) Investigated transfer of nearshore data collection technology from overt controlled vehicles to convert autonomous vehicles.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

Date: MARCH 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603207N PROJECT NUMBER: R1987
PROGRAM ELEMENT TITLE: Air/Ocean Tactical Applications PROJECT TITLE: Mapping, Charting & Geodesy Techniques

2. (U) FY 1996 ACTUALS:

- (U) ($1,167) Continue development of Airborne Laser capability, implement tidal correction algorithm and initiate 3D Global Planning System (GPS) integration. Harden P3 pannier to stand alone. Begin software conversion for tactical application. Transition technology from DOD International Program to U.S. Navy use.
- (U) ($691) Continue information management and Digital Mapping, Charting & Geodesy Support Program (DMAP) functions in conjunction with Defense Mapping Agency (DMA) requirements.
- (U) ($1,600) Initiate demonstration and validation of prototype dual mission Oceanographic Remotely Automation/Remote Minehunting Operational Prototype (ORCA/RMOP) vehicle for joint bathymetric and mine hunting in conjunction with NAVSEA PMS 407 (Mine Countermeasures Program Office) and Naval Coastal Systems Station.
- (U) ($1,600) Continue Test and Evaluation of sensors for ORCA Remotely Operated Vehicle / Autonomous Unmanned Vehicle (ROV/AUV), add expendable sensors, automate vehicle controls, install real time map generation, and integrate meteorology and oceanography (METOC) sensors from 6.3 Ocean Measurement Sensor (OMS) program.
- (U) ($37) Portion of extramural program reserved for Small Business Innovation Research Assessment in accordance with 15 U.S.C. 638.

3. (U) FY 1997 PLAN:

- (U) ($675) Continue Sea Lion demonstration and evaluations, complete automated vehicle controls, continue map generation project, and integration of OMS transitioned sensors.
- (U) ($715) Airborne Laser project, complete tide algorithm, continue multispectral scanner, and add interferometric GPS (3D position) capability.
- (U) ($685) Continue information management and continue DMAP functions. DMAP is the clearing house for reviewing Digital Mapping, Charting and Geodesy requirements.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

Date: MARCH 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603207N PROJECT NUMBER: R1987
PROGRAM ELEMENT TITLE: Air/Ocean Tactical Applications PROJECT TITLE: Mapping, Charting & Geodesy Techniques

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996/97 President's Budget:	1,633	1,994	2,153
(U) Adjustments from PRESBUDG:	0	+3,101	-78
(U) FY 1997 President's Budget Submit:	1,633	5,095	2,075

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1996: Congressional undistributed general and inflation adjustments (+$3,162K); and revised DOD inflation rates and other minor pricing adjustments (-$61K). FY 1997: Revised inflation estimates and other minor pricing adjustments (-$78K).

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

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

(U) RELATED RDT&E: PE 0601153N (Defense Research Sciences)
PE 0305160N (Defense Meteorological Satellite)

D. (U) SCHEDULE PROFILE: Not Applicable

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

Date: MARCH 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603207N PROGRAM ELEMENT TITLE: Air/Ocean Tactical Applications PROJECT NUMBER: R1987 PROJECT TITLE: Mapping, Charting & Geodesy Techniques

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

Project Cost Categories	FY 1995	FY 1996	FY 1997
a. Primary Hardware Development	1,618	3,975	1,005
b. Development, Test & Evaluation		400	400
c. Software Development		450	500
d. Configuration Management		150	50
e. Program Management		100	100
f. Travel	15	20	20
Total	1,633	5,095	2,075

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 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Product Development										
Various	Various		CONT.	CONT.	10,482	1,633	5,095	2,075	CONT.	CONT.
Support and Management										
Test and Evaluation										

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

Date: MARCH 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603207N PROJECT NUMBER: R1987
PROGRAM ELEMENT TITLE: Air/Ocean Tactical Applications PROJECT TITLE: Mapping, Charting & Geodesy Techniques

GOVERNMENT FURNISHED PROPERTY

Item Description	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Delivery Date	Total FY 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Product Development									
Support and Management									
Test and Evaluation									
Subtotal Product Development				10,482	1,633	5,095	2,075	CONT.	CONT.
Subtotal Support and Management									
Subtotal Test and Evaluation									
Total Project				10,482	1,633	5,095	2,075	CONT.	CONT.

C. (U) Funding Profile: Not applicable

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

Date: MARCH 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603207N PROGRAM ELEMENT TITLE: Air/Ocean Tactical Applications PROJECT NUMBER: X2008 PROJECT TITLE: Tactical Ocean Data Assimilation & Prediction

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ACTUAL	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
X2008 Tactical Ocean Data Assimilation and Prediction	2,331	2,061	2,066	2,012	2,438	2,435	2,489	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project develops new techniques for environnmental data assimilation, for both conventional and satellite remotely sensed data, and includes the development of tactical models to utilize these data. Artificial Intelligence, Expert and Rule-Based systems are emphasized. The goal is to provide the Navy with a real-time, stand-alone, shipboard tactical scale atmospheric and oceanographic forecasting capability in accordance with the Pre-Planned Product Improvement (P3I) plan for the Tactical Environmental Support System - TESS(3).

(U) PROGRAM ACCOMPLISMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS:

- (U) ($860) Completed development Systems' of next generation range dependent EM/EO and VLSTrack models for TESS(3). Began incorporation of Expert Systems' applications in these areas.
- (U) ($1,136) Completed development of Yellow Sea oceanographic model. Continued development of coastal and enclosed basin tactical scale oceanographic models for the Sea of Okhotsk, Sea of Japan and other selected geographical locations in response to requirements.
- (U) ($335) Continued incorporation of expert system/artificial intelligence techniques in the 4D assimilation of tactical scale data.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

Date: MARCH 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603207N PROJECT NUMBER: X2008
PROGRAM ELEMENT TITLE: Air/Ocean Tactical Applications PROJECT TITLE: Tactical Ocean Data Assimilation & Prediction

2. (U) FY 1996 PLAN:

- (U) ($1) Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15 U.S.C.638.
- (U) ($716) Complete incorporation of Expert Systems applications in the EM model. Continue to incorporate Expert Systems' applications in the EO and VLSTrack models.
- (U) ($1,054) Continue development of coastal and enclosed basin tactical scale oceanographic models for the Sea of Okhotsk, Sea of Japan and other selected geographical locations, such as the Persian Gulf, Gulf of Oman and the Arabian Sea in response to requirements.
- (U) ($290) Continue incorporation of expert system/artificial intelligence techniques in the 4D assimilation of tactical scale data.

3. (U) FY 1997 PLAN:

- (U) ($605) Complete incorporation of Expert Systems' applications in the EO and VLSTrack area.
- (U) ($235) Begin development of surface-to-air and surface-to-surface EO model.
- (U) ($936) Complete development of the Arabian Sea model. Continue development of coastal and enclosed basin tactical scale oceanographic models for the Sea of Okhotsk, Sea of Japan and other selected geographical locations such as the Persian Gulf and the Gulf of Oman in response to requirements.
- (U) ($290) Complete incorporation of expert system/artificial intelligence techniques in the 4D assimilation of tactical scale data.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

Date: MARCH 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603207N PROGRAM ELEMENT TITLE: Air/Ocean Tactical Applications PROJECT NUMBER: X2008 PROJECT TITLE: Tactical Ocean Data Assimilation & Prediction

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996/97 President's Budget:	2,331	2,125	2,145
(U) Adjustments from PRESBUDG:		-64	-79
(U) FY 1997 President's Budget Submit:	2,331	2,061	2,066

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1996: Congressional undistributed general and inflation reductions (-$41K); and revised DOD inflation rates and other minor pricing adjustments (-$23K). FY 1997: Revised inflation estimates and other minor pricing adjustments (-$79K).

(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 - TESS(3) will incorporate data assimilation techniques and models.

D. (U) SCHEDULE PROFILE: Not applicable.

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

Date: MARCH 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603207N PROGRAM ELEMENT TITLE: Air/Ocean Tactical Applications PROJECT NUMBER: X2008 PROJECT TITLE: Tactical Ocean Data Assimilation & Prediction

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

Project Cost Categories	FY 1995	FY 1996	FY 1997
a. Software Development	2,331	2,061	2,066
Total	2,331	2,061	2,066

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 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Product Development										
Various	Various		VAR.	VAR.	12,688	2,331	2,061	2,066	CONT.	CONT.
Support and Management										
Test and Evaluation										

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

Date: MARCH 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603207N PROGRAM ELEMENT TITLE: Air/Ocean Tactical Applications PROJECT NUMBER: X2008 PROJECT TITLE: Tactical Ocean Data Assimilation & Prediction

GOVERNMENT FURNISHED PROPERTY

Item Description	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Delivery Date	Total FY 1993 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Product Development									
Support and Management									
Test and Evaluation									
Subtotal Product Development				12,688	2,331	2,061	2,066	CONT.	CONT.
Subtotal Support and Management									
Subtotal Test and Evaluation									
Total Project				12,688	2,331	2,061	2,066	CONT.	CONT.

C. (U) FUNDING PROFILE: Not Applicable

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FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603208N
PROGRAM ELEMENT TITLE: Training System Aircraft

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
H1142 T-45 Improvements	558	1,278	453	0	0	0	0	0	712,857
H1150 Joint Primary Aircraft Trainer	3,752	1,699	1,952	3,512	5,336	3,580	909	0	24,308
TOTAL	4,310	2,977	2,405	3,512	5,336	3,580	909	0	737,165

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

(U) The T45TS mission is to provide undergraduate jet pilot training for prospective carrier-based Navy and Marine Corps pilots, and selected international students, to meet aircrew requirements through 1990's and beyond. T45TS is a total training system concept which includes aircraft, simulators, academics and contractor logistics support. Planned RDT&E efforts include evaluation of the Cockpit-21 digital display upgrade and continued flight envelope expansion.

(U) The Joint Primary Aircraft Training System (JPATS) is an ACAT 1C, non-developmental item (NDI), commercial pilot program initiated to provide a high degree of commonality between the flight training program of the United States Navy (USN) and United States Air Force (USAF). The JPATS is to replace the T-34 and T-37 for the USN and USAF, respectively. JPATS shall employ a common primary training aircraft and related aircrew training devices (simulators, computer-aided instruction terminals, etc.) to satisfy both the USAF Primary Aircraft Training System (AFPATS) and the Naval Primary Aircraft Training System (NPATS) requirements. JPATS shall also address the individual service elements of syllabus courseware, data management, and system support. The mission of JPATS will be to train entry-level USN/USAF student pilots in primary flight instruction. The U.S. Air Force is the executive service. This element funds Navy participation in the joint program and Navy unique requirements.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under DEMONSTRATION & VALIDATION because it develops and integrates hardware for experimental test related to specific ship or aircraft applications.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603208N
PROGRAM ELEMENT TITLE: Training System Aircraft

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
H1142 T-45 Improvements	558	1,278	453	0	0	0	0	0	712,857

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The T45TS mission is to provide undergraduate jet pilot training for prospective carrier-based Navy and Marine Corps pilots, and selected international students, to meet aircrew requirements in the 1990's and beyond. T45TS is a total training system concept which includes aircraft, simulators, academics and contractor logistics support. Development of a digital cockpit upgrade (CP21) (including a 1553 avionics architecture and multi-functional displays) is funded in FY 1992 - FY 1996 with production commencing in FY 1996.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS:

- (U) ($0) Obtained MS III approval in January 1995.
- (U) ($271) Conducted review and analysis of T-45 claim.
- (U) ($226) Conducted technical review and analysis of CP21.
- (U) ($61) Conducted technical and program risk assessments.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603208N PROJECT NUMBER: H1142
PROGRAM ELEMENT TITLE: Training System Aircraft PROJECT TITLE: T-45 Improvements

2. (U) FY 1996 PLAN:

- (U) ($832) Complete technical reviews and analysis to support Operational Assessment of CP21.
- (U) ($239) Support and conduct tests to expand the aircraft operating envelope (increase cruise maneuverability and expanded stores carriage and release).
- (U) ($180) Conduct study to define the design and integration of stand alone Global Positioning System (GPS) Inertial Navigation Assembly to meet congressionally mandated incorporation of GPS.
- (U) ($27) Portion of program reserved for Small Business Innovation Research assessment in accordance with 15 U.S.C. 638.

3. (U) FY 1997 PLAN:

- (U) ($453) Continue tests to expand the aircraft operating envelope (increase cruise maneuverability and expanded stores carriage and release).

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603208N PROJECT NUMBER: H1142
PROGRAM ELEMENT TITLE: Training System Aircraft PROJECT TITLE: T-45 Improvements

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996/1997 President's Budget:	258	516	511
(U) Adjustments from PRESBUDG:	+300	+762	-58
(U) FY 1997 President's Budget Submit:	558	1,278	453

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY 1995 increase of $300 thousand represents a below threshold reprogramming for alternate dispute resolution claim support for the T-45 program and extended CP21 development effort. The FY 1996 net adjustment of +$762 thousand represents an increase of $800 thousand for extended CP21 development; -$24 thousand for Congressional undistributed general inflation reductions and -$14 thousand for revised DoD inflation rates. The FY 1997 decrease of $58 thousand represents -$44 thousand for Defense Business Operating Funds adjustments; -$13 thousand for revised DoD inflation rates and -$1 thousand for minor pricing adjustments.

(U) Schedule: Operational Assessment for CP21 slipped from 2Q/95 to 3Q/96 due to deficiencies in software and hardware development efforts.

(U) Technical: Not Applicable

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

	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
• (U) APN-3	238,111	314,646	299,105	268,127	288,948	296,008	272,216	CONT.	CONT.
• (U) APN-5	2,772	8,195	5,642	9,578	32,925	28,273	28,973	CONT.	CONT.
• (U) APN-6	21,067	25,232	18,239	17,863	26,886	27,739	20,850	CONT.	CONT.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603208N PROJECT NUMBER: H1142
PROGRAM ELEMENT TITLE: Training System Aircraft PROJECT TITLE: T-45 Improvements

(U) RELATED RDT&E:

(U) PE 0603216N (Aviation Survivability)
(U) PE 0604777N (Navigation/ID System)

D. (U) SCHEDULE PROFILE:

	FY 1995	FY 1996	FY 1997	TO COMPLETE
Program Milestones	2Q/MS III			
Engineering Milestones		3Q/CP21 OA		
T&E Milestones				3Q/98 DT IIIB 4Q/98 OT IIIB
Contract Milestones				

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603208N PROJECT NUMBER: H1150
PROGRAM ELEMENT TITLE: Training System Aircraft PROJECT TITLE: Joint Primary Aircraft Trainer

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
H1150 Joint Primary Aircraft Trainer System	3,752	1,699	1,952	3,512	5,336	3,580	909	0	24,308

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: JPATS is an ACAT 1C, program initiated to provide a high degree of commonality between the flight training program of the United States Navy (USN) and United States Air Force (USAF). The JPATS is to replace the T-34 and T-37 for the USN and USAF, respectively. JPATS shall employ a common primary training aircraft and related aircrew training devices (simulators, computer-aided instruction terminals, etc.) to satisfy both the USAF Primary Aircraft Training System (AFPATS) and the Naval Primary Aircraft Training system (NPATS) requirements. JPATS shall also address the individual service elements of syllabus courseware, data management, and system support. The mission of JPATS will be to train entry-level USN/USAF student pilots in primary flight instruction. The U.S. Air Force is the executive service for this joint program. This element funds Navy participation in the program and Navy unique requirements.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603208N PROJECT NUMBER: H1150
PROGRAM ELEMENT TITLE: Training System Aircraft PROJECT TITLE: Joint Primary Aircraft Trainer

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS:

- (U) ($444) Completed technical analysis in support of source selection and USN unique requirements for data or analysis. Reached MS II in Aug 95. Provided specific engineering support in structures escape systems discipline.
- (U) ($9) Continued training command support for requirement development and system interface.
- (U) ($208) Completed manufacturing process analysis for source selection.
- (U) ($1,379) Continued Navy unique Anthropometry analysis.
- (U) ($152) Revised Ground Based Training System (GBTS) planning package for contract change proposal and reviewed industry inquiries regarding GBTS program.
- (U) ($134) Reviewed preliminary logistics support analysis development for source selection.
- (U) ($94) Began Instructional Systems Development Study.
- (U) ($1,332) Provide engineering support for air vehicle technical reviews analysis, test and evaluation data analysis in support of USN requirements.

2. (U) FY 1996 PLAN:

- (U) ($60) Provide engineering support for GBTS development, review, and source selection.
- (U) ($316) Support joint qualification test of aircraft and maintain USN test pilot proficiency
- (U) ($116) Provide specific engineering support in structures escape systems disciplines.
- (U) ($189) Support for engineering analysis and program risk.
- (U) ($500) Below threshold reprogramming. Amount includes $300 thousand for SH-60 Block II and $200 thousand for CORAL MAT.

- (U) ($18) Portion of program reserved for Small Business Innovation Research assessment in accordance with 15 U.S.C. 638.
- (U) ($500) Begin air vehicle technical reviews analysis, test and evaluation data analysis in support of USN requirements.

3. (U) FY 1997 PLAN:

- (U) ($241) Continue engineering support for all air vehicle technical reviews/analysis, and begin support for joint operational testing.
- (U) ($565) Continue joint qualification test of aircraft and maintain USN test pilot proficiency.
- (U) ($446) Continue engineering support for GBTS development, review, test and data analysis.
- (U) ($94) Continue reviews of Integrated Logistics Support.
- (U) ($244) Support for engineering analysis and program risk.
- (U) ($362) Provide specific engineering support in structures escape systems disciplines.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603208N PROJECT NUMBER: H1150
PROGRAM ELEMENT TITLE: Training System Aircraft PROJECT TITLE: Joint Primary Aircraft Trainer

B. (U) PROGRAM CHANGE SUMMARY

	FY 1995	FY 1996	FY 1997
(U) FY 1996/1997 President's Budget:	3,752	2,553	3,494
(U) Adjustments from PRESBUDG:	0	-854	-1,542
(U) FY 1997 President's Budget Submit:	3,752	1,699	1,952

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY 1996 net adjustment of -$854 thousand reflects a -$800 thousand below threshhold reprogramming to the T-45 project H1142 and -$34 thousand for Congressional undistributed general and inflation reductions and -$20 thousand for Defense Business Operating Funds adjustments. The FY 1997 net adjustment of -$1,542 thousand represents a -$600 thousand rephasing of requirements adjustment; -$877 thousand for Defense Business Operating Funds adjustments; -$58 thousand for revised DoD inflation rates and -$7 thousand for minor pricing adjustments.

(U) Schedule: Six month delay in contract award from 4Q/95 to 2Q/96 occurred due to protests, which will result in minor adjustments to some program scheduled events. MSIII slipped from 3Q/99 to 1Q/00.

(U) Technical: Not Applicable

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

	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
• (U) APN-3 JPATS	0	0	0	0	0	32,718	78,348	CONT.	CONT.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603208N PROJECT NUMBER: H1150
PROGRAM ELEMENT TITLE: Training System Aircraft PROJECT TITLE: Joint Primary Aircraft Trainer

(U) RELATED RDT&E: Not Applicable

(U) SCHEDULE PROFILE:

	FY 1995	FY 1996	FY 1997	TO COMPLETE
Program Milestones	4Q MS II			1Q/00 MS III
Engineering Milestones*		3Q A/C PDR	2Q A/C CDR	
T&E Milestones*		2Q A/C QT&E		3Q/00 GTBS MOT&E 2Q/98 OA 2Q/99 A/C MOT&E
Contract Milestones		2Q MD AWARD** 2Q LOT II AWARD		

*Tentative dates, pending contract change proposal.
**US Air Force manufacturing development contract.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603216N
PROGRAM ELEMENT TITLE: Aviation Survivability

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
M0097 Aircrew Impact Injury Prevention	1,838	2,383	310	0	0	0	0	0	22,558
W0584 Aircrew Protective Clothing & Devices	8,755	8,836	2,342	3,338	4,350	4,355	4,442	CONT.	CONT.
W0591 Aircraft Survivability & Vulnerability	2,578	2,428	1,801	2,233	2,895	2,897	2,950	CONT.	CONT.
W0592 Aircraft & Ordnance Safety	1,423	1,114	857	1,327	1,742	1,742	1,775	CONT.	CONT.
W1819 Carrier Aircraft Fire Suppression System	1,307	1,114	1,003	1,199	1,461	1,460	1,488	CONT.	CONT.
TOTAL	15,901	15,875	6,313	8,097	10,448	10,454	10,655	CONT.	CONT.

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: Aviation Survivability addresses the issues of aircrew and platform survivability, focusing on enhancing overall opportunity for aircrew and platform protection and enhanced performance. The capabilities addressed under this program element counter emerging threats of next generation operational weapons systems and enhance combat effectiveness in future operational mission scenarios.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603216N
PROGRAM ELEMENT TITLE: Aviation Survivability

(U) Two of the projects address aircrew requirements. Aircrew Impact Injury Prevention develops human dynamic and injury response models to impact acceleration and determines the correlation of these dynamic responses with physiological effects and injuries. Aircrew Protective Clothing and Devices develops, demonstrates and validates technology options that enhance aircrew capability to perform mission. In addition, this project ensures aircrew protection against natural and induced environmental or physiological hazards encountered during routine, combat and emergency flight operations as well as during escape, survival and rescue, following loss of aircraft.

(U) The three remaining projects focus on platform survivability, addressing the reductions in aircraft susceptibility to enemy and non-combat threats, as well as aircraft vulnerabilities to conventional, nuclear, chemical, biological, radiological and directed energy. The Aircraft Survivability and Vulnerability and Safety project expands the survivability technology base and develops prototype hardware which is required to improve the survivability of Naval aircraft. Aircraft and Ordnance Safety transitions generic insensitive munitions technology to Navy and Marine Corps air weapons, ensuring that they are insensitive to fast cook-off, slow cook-off, bullet and fragment impact and sympathetic detonation. Carrier Aircraft Fire Suppression Systems develop improved firefighting systems and fire protective measures for aircraft carriers.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under DEMONSTRATION and VALIDATION because it develops and integrates hardware for experimental test related to specific ship or aircraft applications.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603216N
PROGRAM ELEMENT TITLE: Aviation Survivability

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
M0097 Aircrew Impact Injury Prevention	1,838	2,383	310	0	0	0	0	0	24,697

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project develops human dynamic and injury response models of impact acceleration and determines the correlation of these dynamic responses with physiological effects and injuries. These models will be used to evaluate human protective systems designed to prevent impact injuries. The requirements for this project were initially set forth in NAVAIR letter Ser AIR-531B/206, 22 August 1984, followed by Medical Requirement (MR) No. 15a, 28 January 1988. These were expanded by recommendation of the Naval Research Advisory Committee, Aviator Physical Stress Panel, June 90, followed by Surgeon General's memo for the ASN (RD&A), Ser 26/OU235316, 18 January 1991, and CNO S&T Policy Guidance memo, Ser 911C/1S534990, 23 August 1992.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS:

   - (U) ($1,838) Analyzed male/female head-neck response differences.

2. (U) FY 1996 PLAN:

   - (U) ($2,383) Continue cataloging and organizing existing databases for computerized archival storage and retrieval.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603216N PROGRAM ELEMENT TITLE: Aviation Survivability PROJECT NUMBER: M0097 PROJECT TITLE: Aircrew Impact Injury Prevention

3. (U) FY 1997 PLAN:

- (U) ($310) Complete computerized database archive.

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996/1997 President's Budget	1,824	957	328
(U) Adjustments from PRESBUDG	+14	+1426	-18
(U) FY 1997 Congressional Budget Submit:	1,838	2,383	310

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1995 increase reflects $14 thousand rebalance adjustment. FY 1996 reflects increase of $1,500 thousand for Congressional undistributed general reductions; a decrease of $47 thousand for inflation reductions and $27 thousand for revised DoD inflation rates. FY 1997 decrease $8 thousand for Defense Business Operating Fund and $10 thousand for minor pricing adjustments.

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603216N
PROGRAM ELEMENT TITLE: Aviation Survivability

PROJECT NUMBER: M0097
PROJECT TITLE: Aircrew Impact Injury Prevention

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

(U) RELATED RDT&E:

(U) PE 0602201F (Aerospace Flight Dynamics)
(U) PE 0604264N (Aircrew Systems Development)
(U) PE 0604506F (Aircrew Systems Development)

D. (U) SCHEDULE PROFILE: Not applicable.

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FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603216N PROJECT NUMBER: M0097
PROGRAM ELEMENT TITLE: Aviation Survivability PROJECT TITLE: Aircrew Impact Injury Prevention

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

Project Cost Categories	FY 1995	FY 1996	FY 1997
a. System Engineering	0	0	0
b. Primary Hardware Development	0	0	0
c. Developmental Test & Evaluation	1,815	1,070	0
d. Contractor Engineering Support	0	1300	0
e. Government Engineering Support	6	0	310
f. Travel	17	13	0
Total	1,838	2,383	310

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603216N PROJECT NUMBER: M0097
PROGRAM ELEMENT TITLE: AVIATION SURVIVABILITY PROJECT TITLE: Aircrew Impact Injury Prevention

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 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Product Development										
All other Efforts					24,697	1,609	1,070	0		
Support & Management						212	1,300	310		
Travel						17	13	0		
Test and Evaluation Not Applicable										

GOVERNMENT FURNISHED PROPERTY: Not Applicable

	Total FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Subtotal Product Development	1,609	1,070	310		
Subtotal Support and Management	229	1,313	0		
Subtotal Test and Evaluation	0	0	0		
Total Project	1,838	2,383	310	0	24,697

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603216N
PROGRAM ELEMENT TITLE: Aviation Survivability

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
W0584 Aircrew Protective Clothing and Devices	8,755	8,836	2,342	3,338	4,350	4,355	4,442	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project develops, demonstrates, and validates technology options for functionally integrated aircrew and life support systems designed to enhance mission effectiveness, in-flight protection and emergency survivability. These developments are in accordance with Operational Requirements Documents, such as ORD 210-05-88 for Chemical/Biological (C/B) Protection, ORD 099-05-087 for Laser Eye Protection; Joint Mission Need Statements for a Helmet Mounted High Off-Boresight (HOBS) Cueing/Display System , Air Warrior (AW)System (formerly Aircrew Integrated Ensemble) and advanced anti-G systems; Non-Acquisition Program Development Documents for advanced crew station designs, emergency egress/crash systems and integrated crew protection/performance enhancement systems.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS

- (U) ($455) Redirected Advanced Integrated Life Support (AILSS) to combine SMART AILSS with Air Warrior.
- (U) ($300) BFM Development Testing (DT) for MS II transition.
- (U) ($375) Attained Laser Visor Eye Protection (LVEP) MS II transition.
- (U) ($345) Award contracts for joint Navy/Army AW project with SMART AILSS.
- (U) ($639) Subsystem demonstration of improved ejection seat for current and future Navy/Marine aircraft.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603216N PROJECT NUMBER: WO584
PROGRAM ELEMENT TITLE: Aviation Survivability PROJECT TITLE: Aircrew Protective Clothing & Devices

(U) FY 1995 ACCOMPLISHMENTS (Continued)

- (U) ($160) Reached MS II transition of crashworthiness (CW) load attenuator hardware.
- (U) ($288) Developed cockpit/airbags (CABS) for helicopter crash safety.
- (U) ($1,345) Advanced Technology Crew Station (ATCS)/Dynamic Flight Simulator (DFS) contractor integration and mockup upgrades.
- (U) ($425) Preliminary Advanced Aircrew Oxygen Delivery Station (AAODS) designs; completed AAODS system designs model; awarded contract.
- (U) ($4,123) Continued prototype development of Crusader Advanced Helmet Vision System (AHVS) Tactical Aircraft Integrated Helmet Systems.
- (U) ($300) Initiated tri-service Joint Affordable Cockpit Integration Program (JACIP).

2. (U) FY 1996 PLAN:

- (U) ($350) Design flightworthy AAODS Ceramic Oxygen Generation System (COGS) for tactical aircraft.
- (U) ($2214) Continue Navy tasks for joint Navy/Army development of SMART AILSS/AW System.
- (U) ($222) Design and flight test evaluation of day targeting AHVS/Crusader.
- (U) ($200) Integration and upgrades of ATCS designs in Dynamic Flight Simulator (DFS).
- (U) ($2500) Continue development of controllable propulsion systems for ejection seats in USN/USMC aircraft.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603216N PROJECT NUMBER: W0584
PROGRAM ELEMENT TITLE: Aviation Survivability PROJECT TITLE: Aircrew Protective Clothing & Devices

(U) FY 1996 PLAN (Continued):

- (U) ($3250) Initiate advanced technology escape system demonstration/validation program.
- (U) ($73) Continue JACIP design integration.
- (U) ($27) Portion of program reserved for Small Business Innovation Research assessment in accordance with 15 U.S.C. 638 (f)(1).

3. (U) FY 1997 PLAN:

- (U) ($700) Continue flightworthy AAODS COGS design.
- (U) ($600) Continue Navy tasks for joint development of SMART AILSS/AW system.
- (U) ($ 43) Continue AHVS day targeting DT-1 and commence night ground targeting evaluation with Crusader.
- (U) ($210) Continue workload and mission performance DFS DT and upgrades of contractor ATCS designs.
- (U) ($744) Continue system design for improved ejection seat systems in USN/USMC tactical aircraft.
- (U) ($ 45) Continue JACIP design integration.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603216N PROJECT NUMBER: W0584
PROGRAM ELEMENT TITLE: Aviation Survivability PROJECT TITLE: Aircrew Protective Clothing & Devices

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996/1997 President's Budget	8,755	1,719	3,200
(U) Adjustments from PRESBUDG:	0	+7,117	-858
(U) FY 1997 Congressional Budget Submit:	8,755	8,836	2,342

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY 1996 reflects an increase of $7,400 thousand for Congressional adjustment and decreases of $177 thousand for Congressional undistributed general and inflation reductions; $106 thousand for revised DoD inflation rates. FY 1997 reflects decrease of $783 thousand for Defense Budget Operating Fund activites adjustments and $75 thousand for Congressional undistributed general and inflation reductions.

(U) Schedule: The FY96 Congressional increase permits initiation of advanced technology escape system demonstration/validation program; FY97 decreases extend the program and delay achievment of milestones.

(U) Technical: Not Applicable.

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

(U) RELATED RDT&E:

(U) PE 0602201F (Aerospace Flight Dynamics)
(U) PE 0602233N (Mission Support Equipment)
(U) PE 0604264N (Aircrew Systems Development)
(U) PE 0604706F (Aircrew Systems Development)

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603216N
PROGRAM ELEMENT TITLE: Aviation Survivability

PROJECT NUMBER: W0584
PROJECT TITLE: Aircrew Protective Clothing & Devices

D. (U) SCHEDULE PROFILE:

	FY95	FY96	FY97	TO COMPLETE
PROJECT MILESTONES	LVEP: MSII CW LOAD ATTENUATOR: MSII AAODS CERAMIC: INITIATE JACIP: INITIATE AILSS: REDIRECT EFFORT	BFM: MSII		CONTINUING
ENGINEERING MILESTONES	AHVS: PROTOTYPES ESCAPE: SUB-SYS DEMO ATCS/DFS: INTEGRATION ATCS MOCKUP: UPGRADE COCKPIT AIR BAGS: DEVELOP SMART AILSS: DESIGN AIR WARRIOR: DESIGN	JACIP: DESIGN ESCAPE: SYSTEM DESIGN ATCS/DFS: INTEGRATION ATCS: MOCKUP UPGRADE SMART AILSS: SYSTEM DESIGN	JACIP: DESIGN ESCAPE: SUBSYSTEMS DESIGNS ATCS: MOCKUP UPGRADE AAODS CERAMIC: DESIGN CRUSADER: DESIGN	
T&E MILESTONES	BFM: DT CRUSADER: DT	AHVS: DT	AHVS: DT ATCS DFS: DT SMART AILSS: DEVELOPMENTAL FLT TST AIR WARRIOR: FLT TST	
CONTRACT MILESTONES	AIR WARRIOR: AWARD CRUSADER: AWARD SMART AILSS: AWARD	AAODS CERAMIC: AWARD ESCAPE: SYSTEM/SUBSYSTEM AWARDS		

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603216N
PROGRAM ELEMENT TITLE: Aviation Survivability

PROJECT NUMBER: W0584
PROJECT TITLE: Aircrew Protective Clothing & Devices

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

Project Cost Categories	FY 1995	FY 1996	FY 1997
a. System Engineering	1,014	1050	717
b. Primary Hardware Development	1,035	300	500
c. Developmental Test & Evaluation	1,098	480	900
d. Contractor Engineering Support	4,218	6175	100
e. Government Engineering Support	1,340	754	100
f. Travel	50	50	25
g. SBIR Assessment	0	27	0
Total	8,755	8,836	2,342

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603216N PROJECT NUMBER: W0584
PROGRAM ELEMENT TITLE: AVIATION SURVIVABILITY PROJECT TITLE: Aircrew Protective Clothing & Devices

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 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Product Development										
NAWC	WX	10/96				3,468	874	792		
NAWC,WRM	Various Contracts					2,403	3,250	600	CONT	CONT
WPAFB	MIPR	N/A				1,395	2,625	0	0	0
All other efforts						1,344	1,915	900	CONT	CONT
Support and Management						145	145	50	CONT	CONT

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: March 1996

BUDGET ACTIVITY: 4
PROGRAM ELEMENT: 0603216N
PROGRAM ELEMENT TITLE: Aviation Survivability
PROJECT NUMBER: W0584
PROJECT TITLE: Aircrew Protective Clothing & Devices

Test and Evaluation: Not Applicable

GOVERNMENT FURNISHED PROPERTY: Not Applicable

	Total FY 1995 Budget	Fy 1996 Budget	FY 1997 Budget	To Complete	Total Program
Subtotal Product Development	8,610	8,664	2,292	CONT.	CONT.
Subtotal Support and Management	145	145	50	CONT.	CONT.
Subtotal Test and Evaluation	0	0	0	0	0
SBIR Assessment	0	27	0	0	
Total Project	8,755	8,836	2,342	CONT.	CONT.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603216N
PROGRAM ELEMENT TITLE: Aviation Survivability

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1995 ESTIMATE	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
WO591 A/C Survivability & Vulnerability & Safety	2,578	2,428	1,801	2,233	2,895	2,897	2,950	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: WO591, Aircraft Survivability, Vulnerability and Safety. This project develops prototype hardware to improve the survivability of Navy and Marine Corps aircraft. This project addresses the likelihood of an aircraft being hit (susceptibility) and the probability of a kill if the aircraft is hit (vulnerability). Types of programs funded under this project include signature reduction efforts, subsystem and component hardening and development of fire and explosion suppression techniques for fuel systems. Effective fiscal year 1996 Chemical/Biological efforts were consolidated under OSD program element 0603384D (Chemical/Biological Defense (Advanced Development)).

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS:

- (U) ($1,675) Continued AH-1W Survivability Enhancement Program including fabrication of parts.
- (U) ($162) Developed a survivability RDT&E master plan.
- (U) ($533) Developed survivability analysis methodology and update aircraft survivability assessments.
- (U) ($208) Developed survivability database.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603216N PROJECT NUMBER: W0591
PROGRAM ELEMENT TITLE: Aviation Survivability PROJECT TITLE: Aircraft Surviv. Vulnerability & Safety

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996/1997 President's Budget:	2,583	2,505	2,145
(U) Adjustments from PRESBUDG:	-5	-77	-344
(U) FY 1997 President's Budget Submit:	2,578	2,428	1,801

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1995 funds in the amount of $5 thousand were transferred to cancelled accounts to cover prior year liabilities. The FY 1996 decrease reflects $49 thousand for Congressional general and inflation reductions, and $28 thousand for revised DoD inflation rates. The FY 1997 decrease reflects $286 thousand for DoD Defense Business Operating Fund activities reductions and $58 thousand for revised DoD inflation rates.

(U) Schedule: Delay of 6 months for completion of development of the aircraft survivability methodology database and the survivability analysis methodology. Completion date was scheduled for 30 September 1996.

(U) Technical: Not Applicable

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

(U) RELATED RDT&E:

(U) PE: 0605132D (Joint Technical Coordinating Group on Aircraft Survivability)
0603384D (Chemical/Biological Defense (Advanced Development))

D. (U) SCHEDULE PROFILE: Not Applicable

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603216N PROJECT NUMBER: W0591
PROGRAM ELEMENT TITLE: Aviation Survivability PROJECT TITLE: Aircraft Surviv. Vulnerability & Safety

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

Project Cost Categories	FY 1995	FY 1996	FY 1997
a. Primary Hardware Development	1,375	1,373	987
b. Hardware Test	370	200	152
c. Software Development	350	471	100
d. Quality Assurance	433	330	512
e. Travel	50	50	50
f. SBIR		4	
Total	2,578	2,428	1,801

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603216N PROJECT NUMBER: W0591
PROGRAM ELEMENT TITLE: Aviation Survivability PROJECT TITLE: Aircraft Surviv. Vulnerability & Safety

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 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Product Development										
Major Efforts:										
Bell Helicopter Fortworth, TX	CPFF	6/95	1,200	1,200	0	1,200	107		CONT.	CONT.
TBD	C/CPIF	6/96	693	693			693	0	CONT.	CONT.
NAWCWD CH LK	WX					317	815	987	CONT.	CONT.
All Other Efforts:										
Contractor						0	0	363		
Field Activity	(various)					641	759	401	CONT.	CONT.
Support and Management										
Travel						50	50	50	CONT.	CONT.
Test and Evaluation										
All Other Efforts						370	0	0	CONT.	CONT.

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603216N PROJECT NUMBER: W0591
PROGRAM ELEMENT TITLE: Aviation Survivability PROJECT TITLE: Aircraft Surviv. Vulner. & Safety

GOVERNMENT FURNISHED PROPERTY Not Applicable

	FY 1994 Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Subtotal Product Development		2,158	2,374	1,751	CONT.	CONT.
Subtotal Support and Management		50	50	50	CONT.	CONT.
Subtotal Test and Evaluation		370	0	0	CONT.	CONT.
SBIR Assessment			4			
Total Project		2,578	2,428	1,801	CONT.	CONT.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603216N PROJECT NUMBER: W0592
PROGRAM ELEMENT TITLE: Aviation Survivability PROJECT TITLE: Aircraft & Ordnance Safety

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
W0592 Aircraft and Ordnance Safety	1,423	1,114	857	1,327	1,742	1,742	1,775	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project transitions Insensitive Munitions (IM) technology from IM Advanced Development (generic technology) to Air Weapon Systems to comply with Chief of Naval Operations direction that all munitions carried aboard Navy ships be insensitive to fast cook-off (FCO), slow cook-off (SCO), bullet and fragment impact (BI/FI), and sympathetic detonation (SD).

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS:

- (U) ($250) Initiated IM evaluation of Sidewinder rocket motor.
- (U) ($423) Initiated 2.75" rocket motor and unitary lethal warhead IM technology demonstration.
- (U) ($200) Evaluated outgassing liner technology for Standoff Land Attack Missile (SLAM) Hard Target Penetrating (HTP) warhead.
- (U) ($255) Evaluated container shielding technology for Joint Stand-off Weapon System (JSOW) unitary warhead IM.
- (U) ($250) Initiated IM risk reduction effort for Tomahawk HTP warhead.
- (U) ($45) Assessed weapons systems IM technology transition phase.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603216N PROJECT NUMBER: W0592
PROGRAM ELEMENT TITLE: Aviation Survivability PROJECT TITLE: Aircraft & Ordnance Safety

2. (U) FY 1996 PLAN:

- (U) ($131) Conduct Slow Cookoff studies of Advanced Medium Range Air-to-Air Missile (AMRAAM) rocket motor.
- (U) ($228) Conduct demonstration of 2.75" rocket motor IM technology.
- (U) ($105) Complete outgassing liner technology for SLAM HTP warhead.
- (U) ($ 61) Conduct IM risk reduction effort for Tomahawk HTP warhead.
- (U) ($544) Conduct IM evaluation of Sidewinder rocket motor.
- (U) ($ 45) Assess weapons systems IM technology transition plans.

3. (U) FY 1997 PLAN:

- (U) ($151) Initiate evaluation of IM technology for Advanced Medium Range Air-to-Air Missile (AMRAAM) improvement rocket motor and warhead.
- (U) ($706) Demonstrate Sidewinder rocket motor IM technology.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603216N PROJECT NUMBER: W0592
PROGRAM ELEMENT TITLE: Aviation Survivability PROJECT TITLE: Aircraft & Ordnance Safety

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996/1997 President's Budget:	1,423	1,148	1,280
(U) Adjustments from PRESBUDG:	0	-34	-423
(U) FY 1997 Congressional Budget Submit	1,423	1,114	857

(U) Funding: FY 96 decreases reflect $22 thousand for Congressional undistributed general and inflation reductions and $12 thousand for revised DoD inflation rates. FY 97 decreases reflect $395 thousand for Defense Business Operating Fund R&D Activities adjustments; $25 thousand for revised DoD inflation rates and $3 thousand for other minor pricing adjustments.

(U) Schedule: FY97 decreases result in elimination of all planned tasks in FY 97 except for AMRAMM and SIDEWINDER support.

(U) Technical: Not Applicable.

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

(U) RELATED RDT&E:

(U) PE: 0603609N (Conventional Munitions)

D. (U) Schedule Profile: Not Applicable.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603216N
PROGRAM ELEMENT TITLE: Aviation Survivability

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
W1819 Carrier Aircraft Fire Suppression System	1,307	1,114	1,003	1,199	1,461	1,460	1,488	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project develops improved firefighting system and fire protective measures for aircraft related fires on aircraft carriers including assessment of fire properties, the development of the P-25 shipboard firefighting vehicle, improvements to firefighting agents and delivery systems and firefighter training improvements.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENT:

- (U) ($1,014) Completed design and manufacture of P-25 prototypes.
- (U) ($100) Continued development of environmentally safe fire test and training facilities.
- (U) ($40) Continued development of flight deck fire imaging system.
- (U) ($40) Continued development of ordnance cooling requirements.
- (U) ($50) Continued advanced flight deck fire simulator.
- (U) ($63) Continued new firefighting agents tests.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603216N PROJECT NUMBER: W1819
PROGRAM ELEMENT TITLE: Aviation Survivability PROJECT TITLE: Carrier Aircraft Fire Suppression System

2. (U) FY 1996 PLAN:

- (U) ($300) Continue development of ordnance cooling requirements.
- (U) ($309) Continue development of environmentally safe test and training simulator.
- (U) ($330) Begin fire testing of agents, equipment, and aircraft and ordnance materials.
- (U) ($175) Continue development of flight deck imaging system.

3. (U) FY 1997 PLAN:

- (U) ($350) Continue development of ordnance cooling requirements.
- (U) ($412) Continue development of environmentally safe test and training simulator.
- (U) ($241) Continue fire testing of agents, equipment, and aircraft and ordnance materials.

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996/1997 President's Budget:	1,307	1,148	1,213
(U) Adjustments from PRESBUD:	0	-34	-210
(U) FY 1997 Congressional Budget Submit:	1,307	1,114	1,003

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603216N PROJECT NUMBER: W1819
PROGRAM ELEMENT TITLE: Aviation Survivability PROJECT TITLE: Carrier Aircraft Fire Suppression System

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 96 decreases reflect $22 thousand for Congressional undistributed general and inflation reductions; $12 thousand for revised DoD inflation rates. FY 97 decreases reflect $176 thousand for Defense Business Operating Fund R&D Activities reduction, and $34 thousand for Congressional undistributed general and inflation reductions.

(U) Schedule: FY 97 decreases will delay the development of flight deck imaging systems by one year.

(U) Technical: Not Applicable

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

(U) RELATED RDT&E:

(U) PE: 0603514N (Ship Combat Survivability)

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603216N
PROGRAM ELEMENT TITLE: Aviation Survivability

PROJECT NUMBER: W1819
PROJECT TITLE: Carrier Aircraft Fire Suppression System

D. (U) SCHEDULE PROFILE:

	FY 1995	FY 1996	FY 1997	TO COMPLETE
Program Milestones	Video Trainer Mods 3 & 4 Complete 4Q	Video Trainer Mods 5 & 6 Complete 4Q	Complete Video Trainer Mods	
Engineering Milestones				
T&E Milestone				
Contract Milestones	Contract Completion P-25 3Q			

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET **DATE: March 1996**

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603261N

PROGRAM ELEMENT TITLE: Tactical Airborne Reconnaissance

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1995 ACUTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
A2174 Joint Service Imagery Processing System, Navy (JSIPS-N)	0*	0	0	0	0	0	0	0	20,417
E0534 Tactical Reconnaissance System	43,704	20,214	24,085	10,840	1,477	0	0	0	216,567
Total	43,704	20,214	24,085	10,840	1,477	0	0	0	236,984

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Tactical Airborne Reconnaissance Program develops systems to provide timely and accurate imagery intelligence. Present systems provide such imagery from manned platforms using film based sensors, necessitating a return to base for film processing. Manned reconnaissance, with Electro-Optical, Infrared, and Synthetic Aperture Radar (SAR) sensors can provide both broad coverage and high resolution imagery at extended ranges via data link in near real time. The USMC RF-4Bs were phased out in 1990. A Navy Follow-On Tactical Reconnaissance capable aircraft will replace the interim Navy F-14 Tactical Air Reconnaissance Pod System with a suite of sensors that will provide near real time data-linked information, overflight and short range stand-off sensors and all weather SAR sensors, both day and night. A Navy shipboard capability, compatible with the JSIPS-N, will be used for imagery processing, analysis, and storage.

*JSIPS transferred to Program Element 0305154D under Defense Airborne Reconnaissance Office (DARO).

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under DEMONSTRATION & VALIDATION because it develops and integrates hardware for experimental test related to specific ship or aircraft applications.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET **DATE: March 1996**

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603261N
PROGRAM ELEMENT TITLE: Tactical Airborne Reconnaissance

(U) Cost (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
E0534 Tactical Reconnaissance System	43,704	20,214	24,085	10,840	1,477	0	0	0	216,567

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Tactical Airborne Reconnaissance Program develops systems to provide timely and accurate imagery intelligence. Present systems provide such imagery from manned platforms using film based sensors, necessitating a return to base for film processing. Manned reconnaissance, with Electro-Optical, Infrared and Synthetic Aperture Radar (SAR) sensors can provide both broad coverage and high resolution imagery at extended ranges via data link in near real time. The USMC RF-4Bs were phased out in 1990. A Navy Follow-On Tactical Reconnaissance capable aircraft will replace the interim Navy F-14 Tactical Air Reconnaissance Pod System with a suite of sensors that will provide near real time data-linked information, overflight and short range stand-off (O&SRS-O) sensors used for imagery processing, analysis, and storage.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603261N
PROGRAM ELEMENT TITLE: Tactical Airborne Reconnaissance

PROJECT NUMBER: E0534
PROJECT TITLE: Tact. Recon Sys

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS:

- (U) ($43,704) Awarded/Completed Element I of ATARS development contract (risk assessment). Awarded Element II of ATARS development and integration contract. Completed critical design review (CDR) of data link pod. Selected replacement digital tape recorder. Completed preliminary design review (PDR) for digital tape recorder. Continued fabrication of prototype data link pod. Completed refurbishment of sensor suites received from USAF for compatibility with F/A-18D(RC). Commenced development testing.

2. (U) FY 1996 PLAN:

- (U) ($12,216) Continue development of F/A-18 ATARS Tactical Reconnaissance system. Receive replacement digital tape recorders. Commence data link pod integration with ATARS and developmental flight test. Obtain Engineering Change Proposal (ECP) approval for Sensor suite and pallet production.

- (U) ($7,425) Complete developmental flight testing. Commence operational flight testing. Conduct Low-Rate Initial Production (LRIP) program review. Provide in-house technical support.

- (U) ($239) Continue in-house engineering support.

- (U) ($334) Portion of program reserved for Small business Innovation Research and assessment in accordance with 15 USC 638.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603261N
PROGRAM ELEMENT TITLE: Tactical Airborne Reconnaissance

PROJECT NUMBER: E0534
PROJECT TITLE: Tact. Recon Sys

3. (U) FY 1997 PLAN:

- (U) ($22,254) Continue development of F/A-18 ATARS Tactical Reconnaissance system. Conduct software development testing for incorporation into OFP 13C. Commence integration of RUG II Radar with Tactical Reconnaissance system.
- (U) ($1,018) Continue testing of RUG II Radar with data link ATARS. Continue in-house technical support.
- (U) ($813) Continue in-house engineering support.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603261N
PROGRAM ELEMENT TITLE: Tactical Airborne Reconnaissance

PROJECT NUMBER: E0534
PROJECT TITLE: Tact. Recon Sys

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996/1997 President's Budget	45,840	18,924	17,737
(U) Adjustments from PRESBUDG:	-2,136	+1,290	+6,348
(U) FY 1997 President's Budget	43,704	20,214	24,085

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: The net reduction of -$2,136 in FY 1995 is comprised of -$2,000 for Major Range Test Facility Bases (MRTFB) adjustment and -$136 for minor pricing adjustments. The net increase of +$1,290 in FY 1996 is comprised of +$3,999 for Data Link; -$2,000 for MRTFB adjustment; -$448 for Congressional undistributed general and inflation reductions; and-$261 for revised DoD inflation rates. The net increase of +$6,348 in FY 1997 is comprised of +$8,000 for Data Link; -$883 for Defense Business Operating Fund adjustment; -$727 for revised DoD inflation rate adjustments; and -$42 for minor pricing adjustments.

(U) Schedule: Not Applicable

(U) Technical: Not Applicable

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

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

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603261N
PROGRAM ELEMENT TITLE: Tactical Airborne Reconnaissance

PROJECT NUMBER: E0534
PROJECT TITLE: Tact. Recon Sys

(U) RELATED RDT&E:

(U) PE 0204136N (F/A-18 Squadrons (Project E2065 F/A-18 Radar Upgrade Phase II)): Adds all weather reconnaissance capability to multi-mission aircraft; adds SAR imagery mode provisions to radar upgrade.

(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.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET **DATE: March 1996**

BUDGET ACTIVITY: 4 **PROGRAM ELEMENT: 0603261N** **PROGRAM ELEMENT TITLE: Tactical Airborne Reconnaissance** **PROJECT NUMBER: E0534** **PROJECT TITLE: Tact. Recon Sys**

D. (U) SCHEDULE PROFILE:

	1995	FY 1996	FY 1997	TO COMPLETE
Program Milestones	2Q/CDR FOR DATA LINK POD	4Q/LRIP PROGRAM REVIEW		
Engineering Milestones	2Q/PDR Digital Tape Recorder	3Q/ATARS OA	2Q/DATA LINK POD INT DEL	2Q/98 COMPLETE SOFTWARE ENHANCEMENTS
T&E Milestones	3Q/COMMENCE ATARS DT&E	3Q/COMPLETE ATARS DT&E 1Q/CFT	3Q/DATA LINK POD DT 4Q/MARINE COPRS OA	2Q/99 COMPLETE A/C INTEGRATION TESTING
Contract Milestones	3Q/ATARS DEVELOPMENT CONTRACT AWARD		2Q/PRODUCTION CONTRACT AWARD	

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603261N
PROGRAM ELEMENT TITLE: Tactical Airborne Reconnaissance

PROJECT NUMBER: E0534
PROJECT TITLE: Tact. Recon Sys

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

Project Cost Categories	FY 1995	FY 1996	FY 1997
a. Contract	33,986	16,626	17,503
b. Support Contract	296	280	248
c. In-House Support	6,722	2,209	5,416
d. GFE Other (T&E)	2,700	765	918
e. SBIR Assessment		334	
Total	43,704	20,214	24,085

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN **DATE: March 1996**

BUDGET ACTIVITY: 4 **PROGRAM ELEMENT: 0603261N** **PROJECT NUMBER: E0534**
PROGRAM ELEMENT TITLE: Tactical Airborne Reconnaissance **PROJECT TITLE: Tact. Recon Sys**

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 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Product Development										
Loral Fairchild Syosset, NY	S-CPFF	Sept 92	91,051	91,051	91,051	0	0	0	0	91,051
McAir St. Louis, MO	S-CPFF	June 95	75,585	75,585	0	33,986	16,626	17,503	7,470	75,585
Support and Management										
Contracts	Var	Var	TBD	2,037	652	296	280	248	561	2,037
Field Activities	Var	Dec 96	30,186	30,186	20,968	4,922	209	2,416	1,671	30,186
NAWC China Lake	Var	Dec 96	8,800	8,800	0	1,800	2,000	3,000	2,000	8,800
Test and Evaluation										
Field Activities	Var	Var	5,474	5,474	3,576	1,600	65	118	115	5,474
NAWC PAX River	Var	Dec 96	3,100	3,100	0	1,100	700	800	500	3,100
SBIR Assessment	Var	Var	334	334			334			334

GOVERNMENT FURNISHED PROPERTY: Not Applicable

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603261N
PROGRAM ELEMENT TITLE: Tactical Airborne Reconnaissance

PROJECT NUMBER: E0534
PROJECT TITLE: Tact. Recon Sys

	Total FY 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Subtotal Product Development	91,051	33,986	16,626	17,503	7,470	166,636
Subtotal Support and Management	21,620	7,018	2,489	5,664	4,232	41,023
Subtotal Test and Evaluation	3,576	2,700	765	918	615	8,574
SBIR Assessment			334			334
Total Project	116,247	43,704	20,214	24,085	12,317	216,567

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603382N
PROGRAM ELEMENT TITLE: Advanced Combat System Technology

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ACTUAL	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
K0324 Advanced Combat System Technology	2,804	2,687	3,858	5,233	8,865	8,307	14,896	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: These funds will support studies and experiments in distributed computer architecture, radar technology, and Tactical Informational Management Concepts to mature them to transition candidates for introduction into the AEGIS Weapon System. This program will take a disciplined systems engineering approach to find how these advances can be integrated into the AEGIS system and subsequent combat systems, and to plan combat system baseline upgrade schedules. Fully Distributed Computing Architecture is the first advanced development effort, leveraging the Advanced Research Projects Agency High Performance Distributive Computing (Hiper-D) technology effort. It implements the results of distributed processing advances to replace the current AEGIS Combat System architecture with an open, distributed architecture. Radar studies are also being conducted to identify state-of-the-art technology options for the next generation radar. Complex Tactical Information Management of the flow and display of tactical information through the "detect-control-engage" process to better support the operator/decision maker will be a significant priority of this task. These advanced technologies are candidate systems for future baseline upgrades. Specifically, the Surface Combatant Twenty-first Century (SC-21) program will leverage the results of these studies and experiments into SC-21 combat system development. In addition, AEGIS advanced computer architecture will leverage into other new ship classes including LPD-17, CVX and LX.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under DEMONSTRATION & VALIDATION because it develops and integrates hardware for experimental test related to specific ship applications.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS:

- (U) ($250) Performed preliminary system engineering to support the AEGIS Combat System computing upgrade plan.
- (U) ($750) Started test bed development for evaluation of candidate computing solutions against AEGIS tactical applications.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603382N PROJECT NUMBER: K0324
PROGRAM ELEMENT TITLE: Advanced Combat System Technology PROJECT TITLE: Adv Combat System Tech

- (U) ($1,554) Started development of evaluation procedures and tools for open computer architecture systems and evaluated initial HIPER-D (High Performance Distributed Architecture) candidate computing architectures. Continued work with Advanced Research Project Agency supplied technologies.
- (U) ($250) Assessed advanced technologies in the areas of radar technology and advanced display systems for application to future AEGIS baselines.

2. (U) FY 1996 PLAN:

- (U) ($250) Continue system engineering to transition candidate AEGIS Combat System computing architectures into production baselines.
- (U) ($910) Start prototyping and re-engineering activities on AEGIS Weapon System computer programs and port into the HIPER-D test bed.
- (U) ($1,355) Start employing functional partitioning of the AEGIS Weapon System using multi-sensor coordination and advanced tactical information management concepts and measured system performance data to develop AEGIS Weapon System architecture and performance models using prototype modeling tools.
- (U) ($145) Assess advanced technologies in the areas of radar technology and advanced display systems for application to future AEGIS baselines.
- (U) ($27) Portion of extramural program reserved for Small Business Innovative Research assessment in accordance with 15 U.S.C. 638.

3. (U) FY 1997 PLAN:

- (U) ($250) Continue system engineering in support of transition of candidate AEGIS Combat System computing architectures into production baselines.
- (U) ($1,269) Continue prototyping and re-engineering activities on AEGIS Weapon System computer programs.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603382N PROJECT NUMBER: K0324
PROGRAM ELEMENT TITLE: Advanced Combat System Technology PROJECT TITLE: Adv Combat System Tech

- (U) ($2,089) Continue development of AEGIS Weapon System architecture and performance models using prototype modeling tools and multi-sensor coordination and advanced tactical information management concepts.
- (U) ($250) Assess advanced technologies in the areas of radar technology and advanced display systems for application to future AEGIS baselines.

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996 President's Budget:	3,342	2,803	4,254
(U) Adjustments from PRESBUDG:	-538	-116	-396
(U) FY 1997 PRESBUDG Submit:	2,804	2,687	3,858

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1995 funding decreased $10K for Small Business Innovative Research (SBIR), $27K for University Research and $501K to reflect actual expenditures. FY 1996 funding decreased $116K for Congressional undistributed general and inflation reductions; and revised DoD inflation rates and other minor pricing adjustments. FY 1997 decreased by $396K for revised inflation estimates, other minor pricing adjustments, and for the Mine Warfare Plan.

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

C. (U) OTHER PROGRAM FUNDING SUMMARY: To be determined.

(U) RELATED RDT&E:
(U) PE 0604307N (AEGIS Combat System Engineering)

D. (U) SCHEDULE PROFILE: Not applicable.

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FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603451N
PROGRAM ELEMENT TITLE: Tactical Space Operations

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
X1846 Slow Walker/Joint Tactical Ground System (JTAGS)									
	1	0	0	0	0	0	0	0	1
A2055 National Imagery Support (NIS)									
	2,001	933	0	893	1,085	1,084	1,109	CONT	CONT
Total	2,002	933	0	893	1,085	1,084	1,109	CONT	CONT

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This program develops the capability to provide deployed forces with timely, day/night warning and surveillance data. In particular, this program supports efforts to provide warning data on tactical ballistic missiles and aircraft vessels, and provides a capability to deliver timely, original quality imagery to afloat tactical users.

(U) The National Imagery Support project exploits other Service efforts to electronically provide real time and near real time original resolution imagery to Joint Service Imagery Processing System-Navy (JSIPS-N). The JSIPS-N Digital Imagery Workstation Suite Afloat (DIWSA) serves as the national and tactical imagery processing, analysis, and storage system for afloat TOMAHAWK/TACAIR mission planning, mission rehearsal, and C^3I systems. FY98 - FY01 NIS RDT&E provides for Multi-Spectral Imagery (MSI) support to the warfighter and Joint Tactical Ground Station - Navy (JTAGS-N) initiatives. Naval Space Command produces unique, fused multi-spectral imagery products in response to tasking from Fleet units. Deployed naval units possess neither the technical expertise nor highly specialized equipment required to develop these products. Research and development efforts will key on rapid response to Fleet and Fleet Marine Force tasking and delivery of these products from Naval Space Command. JTAGS-N research and development efforts will focus on providing direct, space-based cueing of the Aegis Weapons System with infrared data.

(U) Joint Tactical Ground Stations (JTAGS) is a joint effort with the U.S. Army to develop and field transportable ground stations to process space-based Infrared (IR) data in theater to provide vastly improved warning of theater ballistic missiles attack and Slow Walkers. The JTAGS system will provide information that is accurate and timely to enable destruction of the launcher, incoming missile, and provide alertment downrange.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under DEMONSTRATION & VALIDATION because it develops and integrates hardware for experimental test related to specific ship or aircraft applications.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603451N
PROGRAM ELEMENT TITLE: Tactical Space Operations

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
A2055 National Imagery Support (NIS)	2,001	933	0	893	1,085	1,084	1,109	CONT	CONT

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The National Imagery Support (NIS) project is a project to provide real time/near-real time original quality imagery to afloat forces. An outgrowth of CNO project CHALLENGE ATHENA, NIS will provide the interface between national high capacity imagery sources and the Digital Imagery Workstation Suite Afloat (DIWSA/Joint Service Imagery Processing System - Navy (JSIPS-N). This JSIPS-N DIWSA serves as the national and tactical imagery processing, analysis, and storage system for afloat TOMAHAWK/TACAIR mission planning, mission rehearsal, and C^3I systems.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS:

- (U) ($2,001) Commenced development of NIS interfaces with DIWSA and shipboard antenna including NIS Prototype hardware. Performed modification of NIS for shipboard application.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603451N PROGRAM ELEMENT TITLE: Tactical Space Operations PROJECT NUMBER: A2055 PROJECT TITLE: NIS

2. (U) FY 1996 PLAN:

- (U) ($912) Continue development of NIS interfaces with DIWSA and shipboard antenna, implement hardware prototype, fix Initial Operational Test and Evaluation (IOT&E) deficiencies.

- (U) ($21) Portion of program reserved for Small Business Innovation Research Assessment (SBIR) in accordance with 15 U.S.C. 638.

3. (U) FY 1997 PLAN:

- (U) ($0) FY 1997 funds transfer to Defense Airborne Reconnaissance Office (DARO). Finalize development of NIS interfaces with DIWSA, continue development of NIS interface with shipboard antenna, continue IOT&E software fixes.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603451N
PROGRAM ELEMENT TITLE: Tactical Space Operations

PROJECT NUMBER: A2055
PROJECT TITLE: NIS

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996/1997 President's Budget:	2,001	1,383	1,326
(U) Adjustments from PRESBUDG:	0	-450	-1,326
(U) FY 1997 President's Budget Submit:	2,001	933	0

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 96 reductions of $450 thousand are due to various undistributed reductions. FY 97 funds transferred to the Defense Airborne Reconnaissance Office (DARO).

(U) Schedule: Technology advancements has allowed Navy to accelerate the NIS schedule to support fleet requirements. The accelerated schedule achieves Low-Rate Initial Production (LRIP) and begins testing approximately 6 months sooner with Initial Operational Capability (IOC) occuring in FY 97.

(U) Technical: Not Applicable

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

FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
OPN Line 2903								
0	1,253	0	0	0	0	0	0	1,253

(U) RELATED RDT&E: NOT APPLICABLE

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603451N
PROGRAM ELEMENT TITLE: Tactical Space Operations

PROJECT NUMBER: A2055
PROJECT TITLE: NIS

D. (U) SCHEDULE PROFILE:

	FY 1995	FY 1996	FY 1997	TO COMPLETE
Program Milestones	4Q MS IIB LRIP		1Q MS III IOC	1Q/98 JSIPS-N (NIS) FOC
Engineering Milestones				
T&E MILESTONES	1Q DT/OT-IIB OA	1Q DT-IIC TECHEVAL 4Q OT-IIC OPEVAL		
Contract Milestones	4Q PROTOTYPE			

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FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603502N
PROGRAM ELEMENT TITLE: Surface and Shallow Water Mine Countermeasures

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
Q0260 Minehunt	284	8,966	26,308	7,000	11,583	21,982	19,122	18,100	278,311
Q1233 MCM Improvements	8,835	6,844	1,726	1,387	0	0	0	0	184,303
Q2131 Shallow Water MCM	16,770	18,561	33,001	39,605	39,654	22,818	17,389	CONT.	CONT.
V2094 Unmanned Undersea Vehicle	17,845	19,996	25,960	21,446	24,954	24,076	23,755	CONT.	CONT.
TOTAL	43,734	54,367	86,995	69,438	76,191	68,876	60,266	CONT.	CONT.

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The program provides for developments to combat the threat of known and projected foreign mines against U.S. Naval and merchant shipping in harbors, channels, choke points, sea lines of communications and amphibious and other fleet operating areas. It develops: (1) systems and support for systems which will detect, localize, and counter moored, bottom, close-tethered, and buried mines for use in Mine Countermeasure (MCM) MCM-1 Class, Mine Hunter Coastal (MHC) MHC-51 Class, and other surface ships; (2) systems for detection, neutralizing and sweeping mines from shallow water, very shallow water, surf zones, and beach landing craft zones in support of amphibious operations; (3) near-term and long-term Unmanned Undersea Vehicle (UUV) systems for clandestine mine reconnaissance.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under DEMONSTRATION & VALIDATION because it develops and integrates hardware for experimental test related to specific ship or aircraft applications.

Exhibit R-2

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603502N
PROGRAM ELEMENT TITLE: Surface and Shallow Water Mine Countermeasures

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
Q0260 Minehunt	284	8,966	26,308	7,000	11,583	21,982	19,122	18,100	278,311

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: (1) Improvements to AN/SQQ-32 variable depth minehunting sonar for MCM-1 and MHC-51 class ships; and (2) Remote Minehunting System (RMS): Program develops a new remotely controlled minehunting system for combatants based on a three-fold strategy: develop new vehicle; upgrade with state of the art mine-hunting sensors; and provide a supportable, incremental operational contingency to the fleet during the development process. Since the programming process is not complete, efforts are in progress to restore funding. FY95 efforts were prefinanced with FY94 funding on hold from a previous program.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS:

- (U) AN/SQQ-32:
  - (U) ($284) Continued AN/UYK-44 replacement and man-machine interface.

Exhibit R-2

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603502N PROJECT NUMBER: Q0260
PROGRAM ELEMENT TITLE: Surface and Shallow Water Mine Countermeasures PROJECT TITLE: Minehunt

3. (U) FY 1996 PLAN:

- (U) AN/SQQ-32:
  - (U) ($1,043) System hardware and software development integration and test.
  - (U) ($462) Plan and conduct AT-SEA system test.
  - (U) ($980) Documentation & ILS tasks and preparation for transition to production.

- (U) Remote Minehunting:
  - (U) ($200) Milestone I/II documentation preparation
  - (U) ($250) Develop ILS plans and documentation.
  - (U) ($4,235) Develop RMS Contingency System (V3)
  - (U) ($1,716) Perform system engineering.
  - (U) ($80) Portion of extramural program reserved for Small Business Innovative Research assessment in accordance with 15 U.S.C.638.

4. (U) FY 1997 PLAN:

- (U) Remote Minehunting:
  - (U) ($450) System engineering (New Sensors).
  - (U) ($6,858) Continue development of RMS system (V3) including requisite logistics support for the additional contingency systems.
  - (U) ($19,000) Procure two additional V3 Engineering Development Models (EDM) as contingency systems to accelerate fleet introduction per the CNO directed and approved Near Term Mine Warfare Campaign Plan.

Exhibit R-2

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603502N PROJECT NUMBER: Q0260
PROGRAM ELEMENT TITLE: Surface and Shallow Water Mine Countermeasures PROJECT TITLE: MineHunt

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996 President's Budget:	225	7,605	4,240
(U) Adjustments from PRESBUDG:	+59	+1,361	+22,068
(U) FY 1997 PRESBUDG Submit:	284	8,966	26,308

(U) CHANGE SUMMARY EXPLANATION:
(U) Funding: Remote Minehunting: FY95 increase of $59K based on actual update. FY 96 increase of $1,361K to accelerate RMS (V3) development. FY97 increase of $22,068K to provide two fully supported EDM (V3) contingency systems to meet immediate Fleet requirements in support of the FY 1997 Mine Warfare Campaign Plan.
(U) Schedule: SQQ-32: Full rate Production (FRP) contract award from 3Q/94 to 4Q/94, FRP option awarded in 2Q/95. Added 4Q/96 At-Sea test. Deleted 2Q/95 DT IIIA, 4Q/96 DT-IIIB, and 3Q/97 FOT&E. Remote Minehunt: The program has been restructured. It addresses an evolutionary acquisition strategy with streamlining initiatives while providing the fleet with a series of operational contingencies. Evolutionary (V)3 and (V)4 efforts facilitate delivery of contingency systems (V)3 near term (FY99) and develop a long term system (V)4 which will meet the full operational requirements (beginning in FY03).
(U) Technical: Not applicable.

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

	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
(U) MCM (SQQ-32 Backfit) OPN Line 81	33,387	0	0	0	0	0	0	0	67,729
(U) MCM (SQQ-32 Towed Body) OPN Line 81	5,012	0	0	0	0	0	0	0	24,957

Exhibit R-2

000117

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603502N
PROGRAM ELEMENT TITLE: Surface and Shallow Water Mine Countermeasures

PROJECT NUMBER: Q0260
PROJECT TITLE: MineHunt

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

	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
(U) RMS Contingency Systems									
OPN	0	0	0	0	19,132	19,543	20,339	94,000	153,014
(U) (SQQ-32 P3I)									
OPN	0	0	9,336	9,329	11,693	7,095	0	0	37,473

(U) RELATED RDT&E:

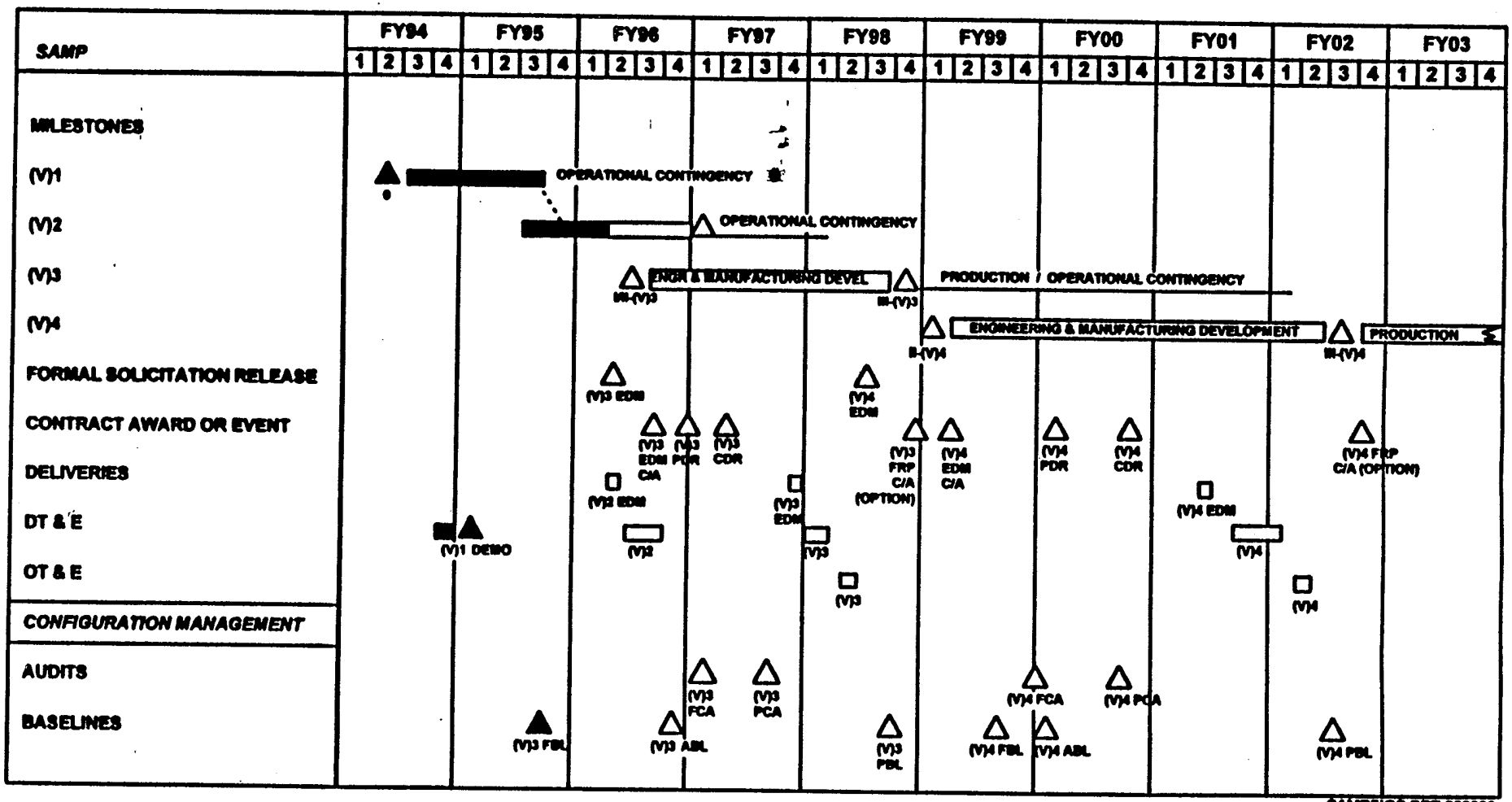
(U) PE 0604373N (Airborne Mine Countermeasures)

D. (U) SCHEDULE PROFILE: See attached.

Exhibit R-2

000118

REMOTE MINEHUNTING SYSTEM PROGRAM SCHEDULE



SAMPFIGS.PPT-022296

ABL - ALLOCATED BASELINE
PBL - PRODUCT BASELINE
FBL - FUNCTIONAL BASELINE

FRP - FULL RATE PRODUCTION
EDM - ENGINEERING DEVELOPMENT MODEL
PDR - PRELIMINARY DESIGN REVIEW

CDR - CRITICAL DESIGN REVIEW
PCA - PHYSICAL CONFIGURATION AUDIT
FCA - FUNCTIONAL CONFIGURATION AUDIT

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603502N PROJECT NUMBER: Q0260
PROGRAM ELEMENT TITLE: Surface and Shallow Water MCM PROJECT TITLE: Minehunt

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

Project Cost Categories	FY 1995	FY 1996	FY 1997
a. System Development	185	4,785	17,961
b. System Testing	0	0	1,618
b. System Engineering Development	21	462	992
c. Logistics Support	0	1,754	1,188
d. Program Management	78	1,885	4,549
e. SBIR	0	80	0
Total	284	8,966	26,308

Exhibit R-3

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603502N PROJECT NUMBER: Q0260
PROGRAM ELEMENT TITLE: Surface and Shallow Water MCM PROJECT TITLE: Minehunt

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 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Product Development										
Contractor TBD	CPAF	6/96	Cont.	Cont.	0	0	2,260	13,231	Cont.	Cont.
NSWC/CSS	WR	VARIOUS	Cont.	Cont.	87,548	185	2,137	825	Cont.	Cont.
NSWC/Crane	WR	VARIOUS	505	505	0	0	505	0	505	505
Support and Management										
Contractor TBD	CPAF	6/96	Cont.	Cont.	0	0	903	2,241	Cont.	Cont.
Sherikon, VA	C/PR	2/93	2,192	2,192	250	0	238	697	1,007	2,192
NSWC/CSS	WR	VARIOUS	Cont.	Cont.	13,297	78	2,356	3,496	Cont.	Cont.
NUWC/Keyport	WR	6/96	105	105	0	0	105	0	105	105
Test and Evaluation										
Contractor TBD	C/PR	6/96	Cont.	Cont.	0	0	0	1,133	Cont.	Cont.
NSWC/CSS	WR	VARIOUS	Cont.	Cont.	8,089	0	362	485	Cont.	Cont.
ARL/UT	PD	VARIOUS	2,568	2,568	2,447	21	100			

Exhibit R-3

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603502N PROJECT NUMBER: Q0260
PROGRAM ELEMENT TITLE: Surface and Shallow Water MCM PROJECT TITLE: Minehunt

GOVERNMENT FURNISHED PROPERTY

Item Description	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Delivery Date	Total FY 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Product Development				0	0	0	4,200	Cont.	Cont.
Support and Management				0	0	0	0	0	0
Test and Evaluation				0	0	0	0	0	0

	Total FY 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Subtotal Product Development	87,548	185	4,902	18,256	Cont.	Cont.
Subtotal Support and Management	13,547	78	3,602	6,434	Cont.	Cont.
Subtotal Test and Evaluation	10,536	21	462	1,618	Cont.	Cont.
Total Project	111,631	284	8,966	26,308	Cont.	Cont.

Exhibit R-3

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603502N
PROGRAM ELEMENT TITLE: Surface and Shallow Water Mine Countermeasures

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
Q1233 MCM Improvements	8,835	6,844	1,726	1,387	0	0	0	0	184,303

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: (1) AN/SSQ-94 will provide on board Combat System Training for MCM and MHC ships; (2) Closed Loop Degaussing (CLDG) to improve survivability of mine countermeasures ships; (3) Mission Package 3 (MP3) upgrade to the AN/SLQ-48 to provide destruction of moored mines in place.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS:

- (U) ($508) AN/SLQ-53: Delivered winch and containers.
- (U) MP3:
  - (U) ($200) Conducted CDR 2Q/95.
  - (U) ($1,800) Conducted developmental testing.
- (U) ($3,464) AN/SSQ-94: Conducted SQQ-32 CDR 3Q/95, installed and tested AN/SSN-2 module.
- (U) CLDG:
  - (U) ($900) Conducted DT-IIA and DT-IIB SHIPEVAL.
  - (U) ($1,100) Advanced Development Model.
  - (U) ($300) Select algorithm for development model.

Exhibit R-2

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603502N
PROGRAM ELEMENT TITLE: Surface and Shallow Water Mine Countermeasures

- (U) CLDG: (Cont.)
  - (U) ($350) Procurement for DT-IIC.
  - (U) ($213) Engineering Support (technical documentation, configuration mgmt).

2. (U) FY 1996 PLAN:

- (U) AN/SLQ-53:
  - (U) ($100) Program termination costs.

- (U) AN/SSQ-94:
  - (U) ($2,668) Install & test AN/SQQ-32 modules, conduct system DT-IIB.

- (U) CLDG:
  - (U) ($1,207) Milestone II.
  - (U) ($700) EDM.
  - (U) ($135) Engineering Support (technical documentation and configuration mgmt).
  - (U) ($442) Development of engineering development model for MCM-10.
  - (U) ($2) Portion of extramural program reserved for Small Business Innovative Research assessment in accordance with 15 U.S.C.638.

- (U) MP3 for AN/SLQ-48:
  - (U) ($1,590) Prepare and conduct DT-IV and OT-IV testing.

3. (U) FY 1997 PLAN:

- (U) ($1,726) CLDG: TECHEVAL.
- (U) ($0) MP3 for AN/SLQ-48: Milestone IV decision.

Exhibit R-2

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603502N PROJECT NUMBER: Q1233
PROGRAM ELEMENT TITLE: Surface and Shallow Water Mine Countermeasures PROJECT TITLE: MCM Improvements

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996 President's Budget:	8,863	7,065	1,911
(U) Adjustments from PRESBUDG:	-28	-221	-185
(U) FY 1997 PRESBUDG Submit:	8,835	6,844	1,726

(U) CHANGE SUMMARY EXPLANATION:
(U) Funding: AN/SLQ-53: FY95 decrease of $28K for actual update and MRTFB; FY96 decrease due to Congressional undistributed general and inflation reductions. FY 97 decrease due to revised inflation estimates and other minor pricing adjustments.
(U) Schedule: AN/SSQ-94: Deleted SYQ-13 PDR and CDR and added System DT-IIB in 4Q/96. CLDG: Milestone II from 2Q/95 to 2Q/96 due to requirements validation.
MP-3: Production award from 1Q/98 to 1Q/97 (typographic error).
(U) Technical: Not applicable.

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

	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
(U) OPN (SSQ-94)									
Line 262200	4,194	1,276	1,089	576	1024	0	0	0	10,919
(U) OPN (SLQ-53)									
Line 097500	0	0	0	0	0	0	0	0	0
(U) WPN (MP-3)									
Line 535000	0	0	2,300	2,366	2,416	3,278	3,342	CONT.	CONT.
(U) OPN (CLDG)									
Line 262200	0	0	0	0	4,361	3,197	5,316	CONT.	CONT.

Exhibit R-2

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603502N
PROGRAM ELEMENT TITLE: Surface and Shallow Water Mine Countermeasures

PROJECT NUMBER: Q1233
PROJECT TITLE:MCM Improvements

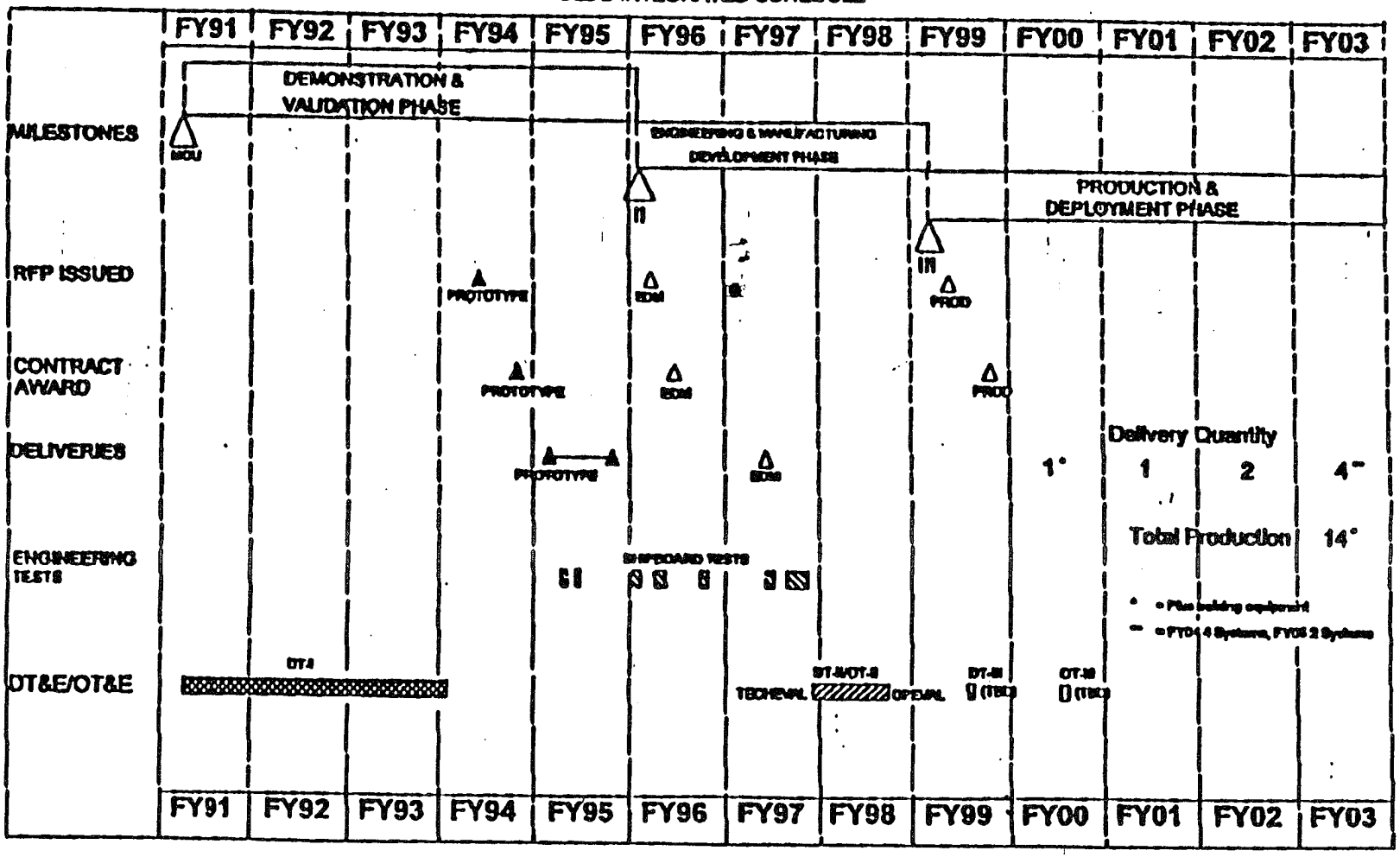
(U) RELATED RDT&E: Not Applicable.

D. (U) SCHEDULE PROFILE: See attached.

Exhibit R-2

000126

CLDG INTEGRATED SCHEDULE



AN/SLQ-48(V)
MINE NEUTRALIZATION SYSTEM MP-3

PROGRAM STATUS

- **PROGRAM PLAN**

	FY93	FY94	FY95	FY96	FY97	FY98	FY99	FY00	FY01	FY02	FY03
APBA											
Milestones					IV						
Development Schedule		PDR	CDR								
DT&E				DT-IIIC							
FOT&E				OT-IV							
Contract Award											
Production						PRODUCTION					
Configuration Management											
Audits		FCA			PCA		MSD				
MNS ECP Approval											
Baselines		FBL			PBL						
Program Adjustments											
MILESTONES											
Development Schedule	PDR	CDR									

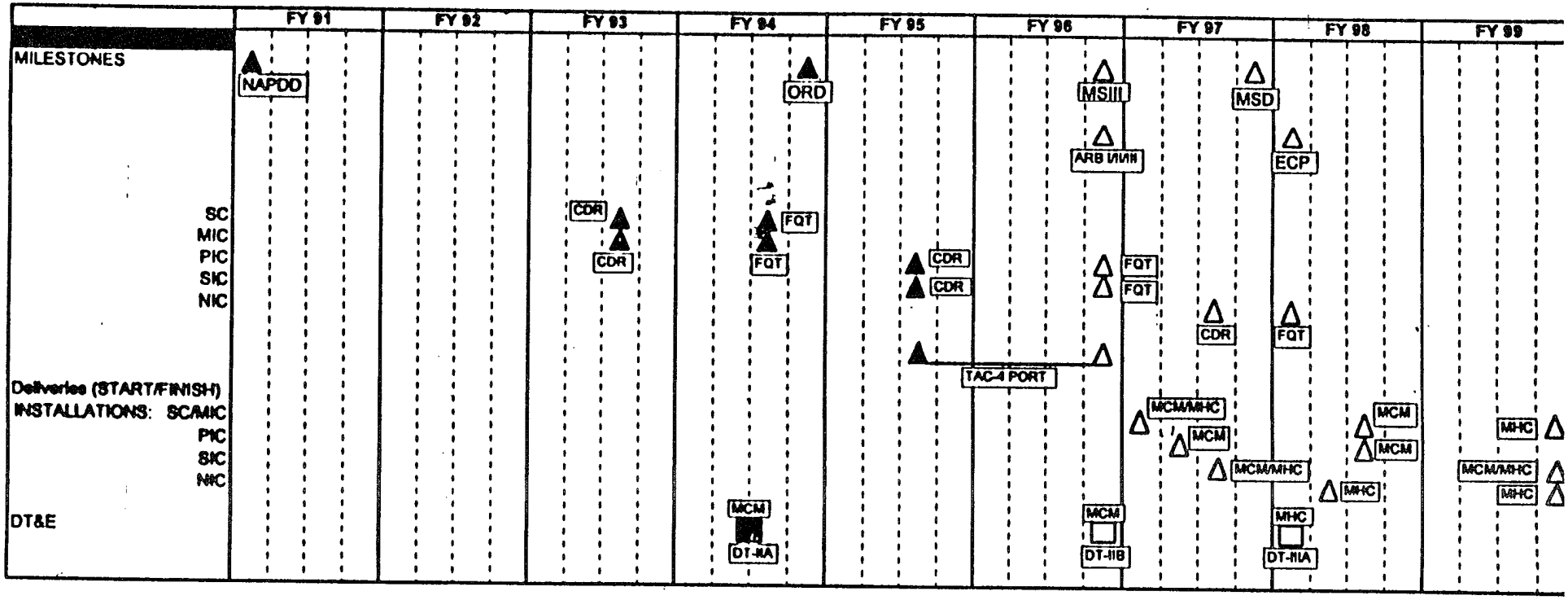


FIGURE 3. AN/SSQ-94-T1 INTEGRATED TEST PROGRAM SCHEDULE

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603502N
PROGRAM ELEMENT TITLE: Surface and Shallow Water MCM Countermeasures

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
Q2131 Shallow Water MCM	16,770	18,561	33,001	39,605	39,654	22,818	17,389	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This program provides for a combination of joint US Marine Corps and US Navy projects planned to counter the threat to amphibious landing forces from known and projected foreign land and sea mines and obstacles in the shallow water, very shallow water and surf zone approaches to amphibious assault areas. It develops systems for mine sweeping, explosive mine clearance, and marking of cleared lanes. Included are the High Speed Remote Influence Sweep (HSRIS), Distributed Explosives Technology (DET), Shallow Water Assault Breach System (SABRE) and follow-on P3I efforts, and Breach Lane Navigation System (BLNS). Beginning FY98, includes transition of ongoing Advanced Technology Demonstration Systems (ATDS) - Advanced Lightweight Influence, Sweep System (ALISS) and Explosive Neutralization (EN) to acquisition programs.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS:
   - (U) HSRIS:
     - (U) ($1,864) Completed PDS and terminated program.
   - (U) DET:
     - (U) ($834) Milestone I.
     - (U) ($2,140) Conducted deployment of inert/live array on land.
     - (U) ($2,300) Conducted preliminary design review.
     - (U) ($300) Conducted DT-I explosive tests against mines.
     - (U) ($1,140) Conducted preliminary MCAC integration tests.

Exhibit R-2

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603502N PROJECT NUMBER: Q2131
PROGRAM ELEMENT TITLE: Surface and Shallow Water Mine Countermeasures PROJECT TITLE: Shallow Water MCM

- (U) DET: (Cont.)
  - (U) ($816) Initiated array stability tests in the surf.
  - (U) ($568) Complete array stability tests in surf zone.

- (U) SABRE:
  - (U) ($2,949) Fabricated test hardware for component tests and DT-I.
  - (U) ($1,809) Conducted flight and effectiveness tests.
  - (U) ($250) Conducted platform integration tests.
  - (U) ($400) Procured threat targets for testings.

- (U) OBS:
  - (U) ($513) Conducted explosive tests against medium and light obstacles.
  - (U) ($687) Conducted alternate concept feasibility studies.

- (U) BLNS:
  - (U) ($105) Conducted DT tests.
  - (U) ($95) Milestone I/II/III.

2. (U) FY 1996 PLAN:

- (U) DET:
  - (U) ($863) Milestone II.
  - (U) ($5,382) Begin partial fabrication of DT-IIA/B hardware.
  - (U) ($1,153) Conduct DT-IIA tests.
  - (U) ($2,600) Procure long lead detonating cord for DT-IIB/OT-II.
  - (U) ($109) Portion of extramural program reserved for Small Business Innovative Research assessment in accordance with 15 U.S.C.638.

Exhibit R-2

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603502N PROJECT NUMBER: Q2131
PROGRAM ELEMENT TITLE: Surface and Shallow Water Mine Countermeasures PROJECT TITLE: Shallow Water MCM

- (U) SABRE: (Cont.)
  - (U) ($3,601) Fabricate test hardware for DT-I.
  - (U) ($1,181) Deployment and DT-I tests.
  - (U) ($734) Milestone II.
- (U) OBS:
  - (U) ($1,520) Preliminary design - Explosive system
  - (U) ($1,018) Preliminary design - Mechanical system
  - (U) ($200) COEA
  - (U) ($200) Milestone I

3. (U) FY 1997 PLAN:

- (U) DET:
  - (U) ($8,884) Complete fabrication of DT-IIB OT-II hardware.
  - (U) ($1,900) Conduct DET/SABRE LCAC interoperability tests.
  - (U) ($1,750) Update documentation package.
  - (U) ($1,500) MCAC integration.
- (U) SABRE:
  - (U) ($4,700) Fabrication of DT-II hardware.
  - (U) ($2,448) DT-II.
  - (U) ($300) Procure test targets.
  - (U) ($990) LCAC integration test hardware.
  - (U) ($2,145) LCAC integration tests.
  - (U) ($4,140) Procure long-lead OT-II hardware.
- (U) OBS:
  - (U) ($1,419) Contract/Fabricate DT-I Hardware (Explosive).
  - (U) ($1,419) Contract/Fabricate DT-I Hardware (Mechanical).
  - (U) ($1,000) System design/engineering.
  - (U) ($406) DT/OT-I.

Exhibit R-2

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603502N PROJECT NUMBER: Q2131
PROGRAM ELEMENT TITLE: Surface and Shallow Water MCM PROJECT TITLE: Shallow Water MCM

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996 President's Budget:	16,812	19,163	20,399
(U) Adjustments from PRESBUDG:	-42	-602	+12,602
(U) FY 1997 PRESBUDG Submit:	16,770	18,561	33,001

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: DET: FY95 decrease of $42K based on actual update. FY 96 decrease due to Congressional undistributed general and inflation reductions. FY97 increases for DET and SABRE efforts.
(U) Schedule: DET: Milestone I from 3Q/95 to 4Q/95 awaiting approval of TEMP, MSIII from 3Q/99 to 4Q/99, OT-IIB from 1Q/99 to 3Q/99.
(U) Technical: Not applicable.

Exhibit R-2

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603502N PROJECT NUMBER: Q2131
PROGRAM ELEMENT TITLE: Surface and Shallow Water MCM PROJECT TITLE: Shallow Water MCM

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

	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
OPN line (2624)	0	388	961	0	15,033	29,285	33,879	Cont.	Cont.

(U) RELATED RDT&E:

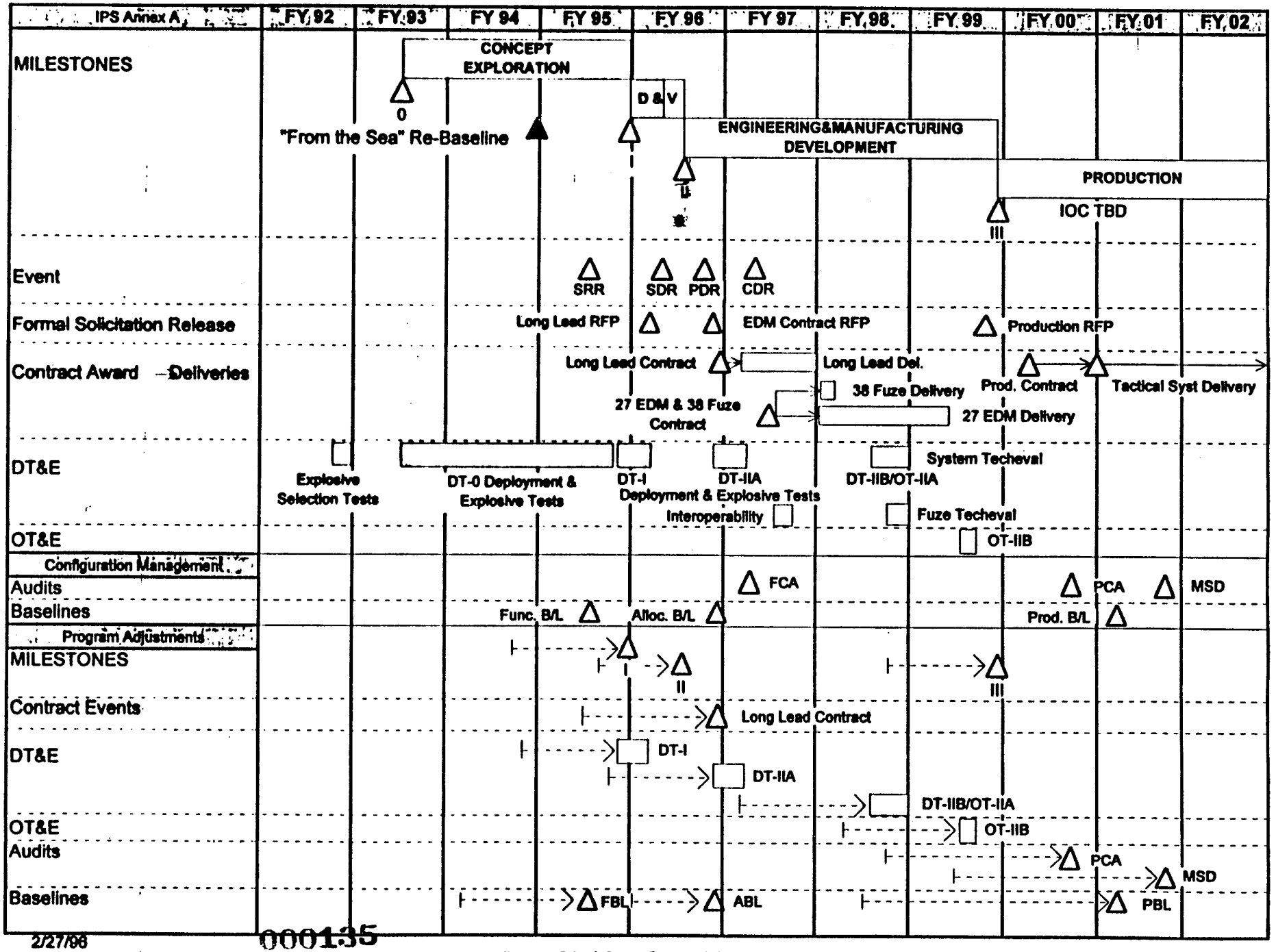
(U) PE 0603555N(Sea Control and Littoral Warfare Technology Demonstration).
PE 0603640M and 0602131M (Advanced Countermine System (ACS); USMC M58 line charges).

D. (U) SCHEDULE PROFILE: See attached.

Exhibit R-2

DISTRIBUTED EXPLOSIVE TECHNOLOGY
PROGRAM STATUS

● PROGRAM PLAN



2/27/98

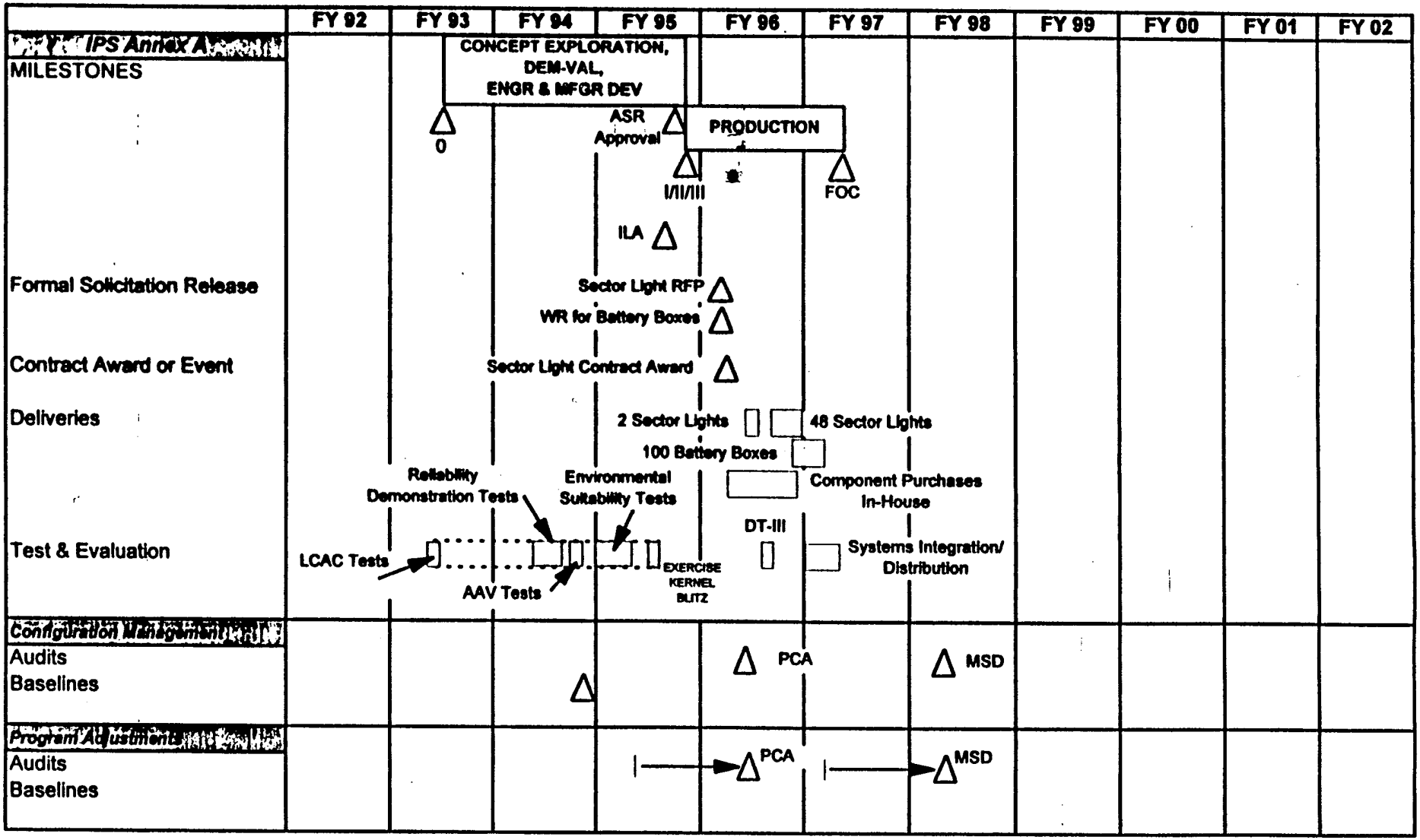
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BEACON, BREACH LANE NAVIGATION EX 7 MOD 0

PROGRAM STATUS

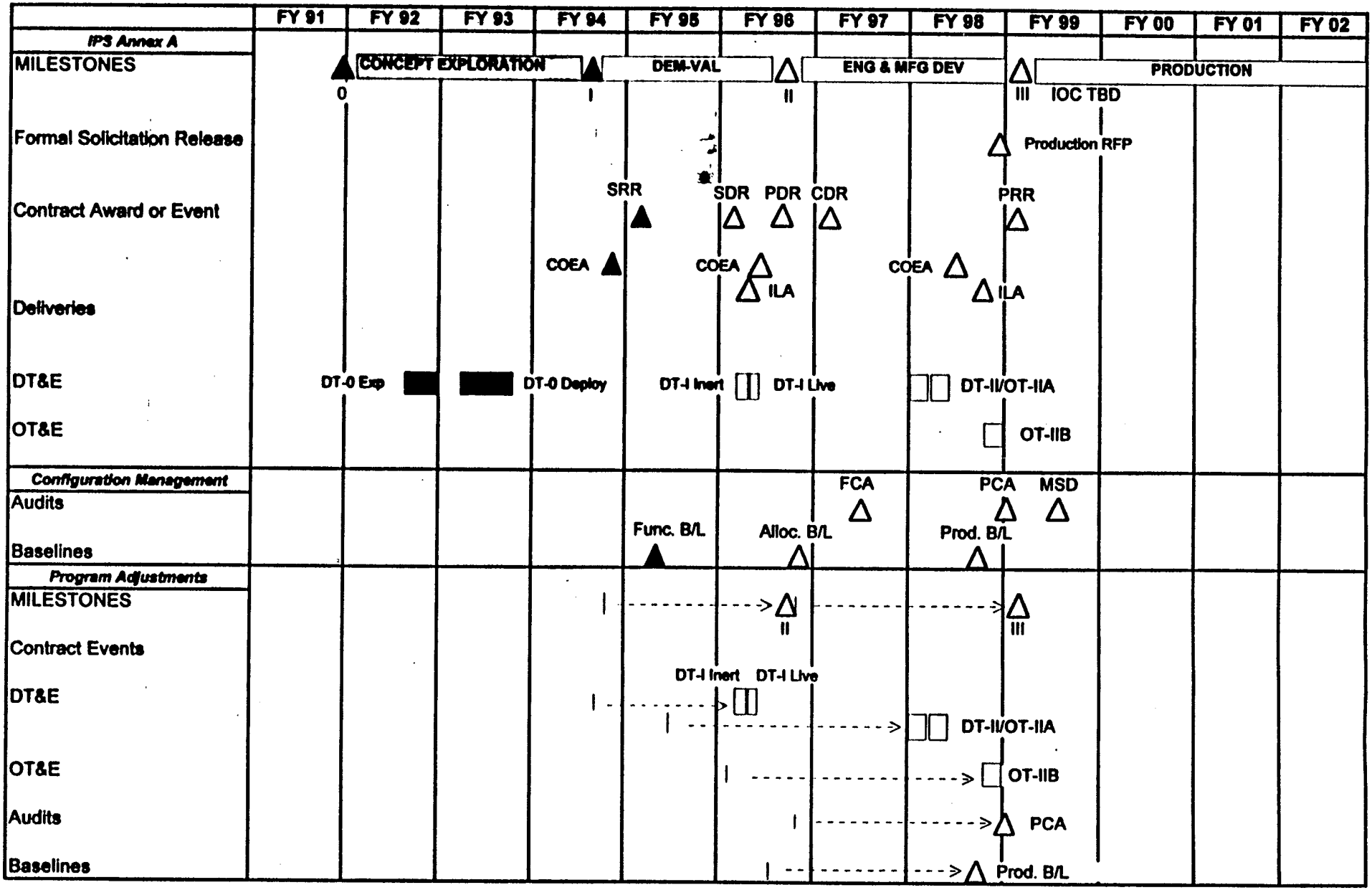
P.E. 0603502N/Q2131

- **PROGRAM PLAN**



SABRE EX 9 MOD 0
SHALLOW WATER ASSAULT BREACHING SYSTEM
PROGRAM STATUS

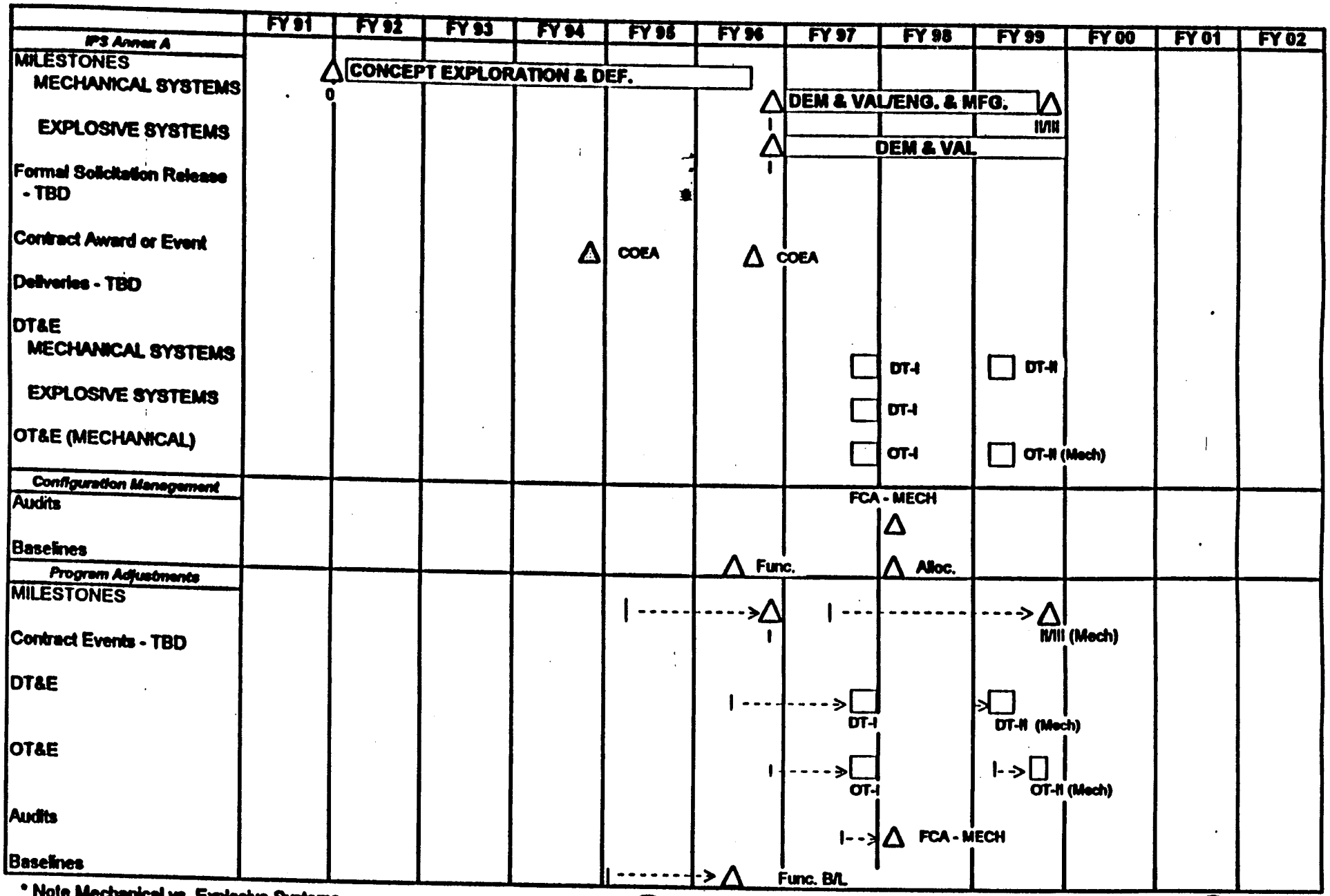
● PROGRAM PLAN



OBSTACLE BREACHING SYSTEM
PROGRAM STATUS

P.E. 0603502N/Q2131

● PROGRAM PLAN



* Note Mechanical vs. Explosive Systems

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603502N PROJECT NUMBER: Q2131
PROGRAM ELEMENT TITLE: Surface and Shallow Water MCM PROJECT TITLE: Shallow Water MCM

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

Project Cost Categories	FY 1995	FY 1996	FY 1997
a. System Development	4,958	10,635	21,371
b. System Testing	4,131	1,842	2,886
c. System Engineering Development	5,810	3,304	5,048
d. Logistics Support	363	897	915
e. Procurement Support	202	417	760
f. Technical Management	838	801	1,030
g. Program Management	274	486	906
h. Travel	194	70	85
i. SBIR	0	109	0
Total	16,770	18,561	33,001

Exhibit R-3

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603502N PROJECT NUMBER: Q2131
PROGRAM ELEMENT TITLE: Surface and Shallow Water MCM PROJECT TITLE: Shallow Water MCM

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 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Product Development										
NSWC/PC	WR	10/95	Cont.	Cont.	13,065	3,679	2,870	2,088	Cont.	Cont.
NSWC/IH	WR	10/95	Cont.	Cont.	16,436	6,872	9,588	22,711	Cont.	Cont.
Misc	Various	Various	2,175	2,175	1,693	482	0	0	0	2,175
Support and Management										
NCSC/PC	WR	10/95	Cont.	Cont.	130	1066	1088	602	Cont.	Cont.
NCWC/IH	WR	10/95	Cont.	Cont.	0	200	610	1268	Cont.	Cont.
Misc	Various	Various	Cont.	Cont.	2,030	427	556	991	Cont.	Cont.
Test and Evaluation										
NCSC/PC	WR	10/95	Cont.	Cont.	1,881	1,155	1,203	1,322	Cont.	Cont.
NSWC/IH	WR	10/95	Cont.	Cont.	2,684	2,889	2,332	3,829	Cont.	Cont.
Misc(PMS-377)	Various	Various	957	957	453	0	314	190	0	957

Exhibit R-3

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603502N PROJECT NUMBER: Q2131
PROGRAM ELEMENT TITLE: Surface and Shallow Water MCM PROJECT TITLE: Shallow Water MCM

GOVERNMENT FURNISHED PROPERTY

Item Description	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Delivery Date	Total FY 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Product Development				0	0	0	0	0	0
Support and Management				0	0	0	0	0	0
Test and Evaluation				0	0	0	0	0	0

	Total FY 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Subtotal Product Development	31,194	11,033	12,458	24,799	Cont.	Cont.
Subtotal Support and Management	2,160	1,693	2,254	2,861	Cont.	Cont.
Subtotal Test and Evaluation	5,018	4,044	3,849	5,341	Cont.	Cont.
Total Project	38,372	16,770	18,561	33,001	Cont.	Cont.

Exhibit R-3

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603502N
PROGRAM ELEMENT TITLE: Surface and Shallow Water Mine Countermeasures

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
V2094 Unmanned Underwater Vehicle (UUV)	17,845	19,996	25,960	21,446	24,954	24,076	23,755	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project was completely restructured in FY 1994 in response to Congressional direction provided in the FY 1994 DOD Appropriations Act. Specifically, the Office of the Secretary of Defense and the Navy were directed to (1) establish priorities among various proposed UUV programs, (2) focus on near-term mine countermeasures issues, and (3) establish affordable, cost-effective programs. The Navy developed an overall UUV Program Plan, which was approved by ASN(RD&A) June 1994, endorsed by USD(A&T) and forwarded to Congress to support FY 1995 budget deliberations.

(U) The UUV Program Plan establishes a clandestine, near-term mine reconnaissance capability as the Navy's top UUV priority; a long-term mine reconnaissance system as priority two; the conduct of surveillance, intelligence and tactical oceanography missions as priority three; and exploring advanced UUV designs for the future as priority four. FY 1995 Congressional language complimented the Navy Plan and fully supported priorities one and two starting in FY 1995.

(U) The UUV project funds development of a clandestine Near-Term Mine Reconnaissance System (NMRS) and a Long-Term Mine Reconnaissance System (LMRS), the Navy's two highest UUV priorities. The NMRS will be a minehunting UUV system launched and recovered from an SSN-688 class submarine and will be capable of mine detection, classification, and localization. The UUV Program Plan calls for an NMRS Operational Prototype (OP) system delivered to the Fleet by early 1998. Since the NMRS is viewed as a stop-gap capability with a life expectancy of approximately 6 years, the LMRS will be developed to provide a robust, long-term, Fleet capability to conduct clandestine minefield reconnaissance. The LMRS will replace the NMRS as the NMRS is retired.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603502N PROGRAM ELEMENT TITLE: Surface and Shallow Water Mine Countermeasures PROJECT NUMBER: V2094 PROJECT TITLE: Unmanned Underwater Vehicle

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS:
   - (U) ($16,245) Priority 1 (NMRS): Continued the NMRS development contract. Completed preliminary and detailed design; commenced fabrication.
   - (U) ($1,600) Priority 2 (LMRS): Conducted technical studies and MS 0, and began Cost and Operational Effectiveness Analysis (COEA).
2. (U) FY 1996 PLAN:
   - (U) ($16,633) Priority 1 (NMRS): Continue to execute NMRS contract. Complete fabrication of system (except for 2nd UUV).
   - (U) ($419) Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15 U.S.C.638.
   - (U) ($2,944) Priority 2 (LMRS): Completed LMRS COEA. Conduct MS I/II and Develop Request For Proposal (RFP) for competitive contract award. Conduct contracting activities and award LMRS development contract(s). The detailed scope of the LMRS development activities will be determined at Milestone I/II, when the acquisition strategy is approved by the Milestone Decision Authority.
3. (U) FY 1997 PLAN:
   - (U) ($8,117) Priority 1 (NMRS): Conduct factory testing of NMRS and begin at-sea testing. Develop RFP for NMRS Maintenance and Support (M&S). Conduct contracting activities and award NMRS M&S contract.
   - (U) ($17,843) Priority 2 (LMRS): Continue execution of LMRS development contract(s). Conduct LMRS Preliminary Design Review (PDR).

Exhibit R-2

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603502N PROJECT NUMBER: V2094
PROGRAM ELEMENT TITLE: Surface and Shallow Water Mine Countermeasures PROJECT TITLE: Unmanned Underwater Vehicle

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996 President's Budget:	16,273	20,694	26,874
(U) Adjustments from PRESBUDG:	+1,572	-698	-914
(U) FY 1997 PRESBUDG Submit:	17,845	19,996	25,960

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: Just prior to submission of the FY 1996 PRESBUDG, an undistributed Congressional reduction of $1,676K was applied against FY 1995. Below Threshold Reprogramming Actions restored $1,572K of the reduction in FY 1995. The adjustments in FY 1996 reflect undistributed Congressional general and inflation reductions. The $914K reduction in FY 1997 reflects revised inflation estimates and other minor pricing adjustments.
(U) Schedule: Not applicable.
(U) Technical: FY 1996 and FY 1997 reductions to contracts and engineering support activities increase program technical risk.

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

(U) RELATED RDT&E:

(U) PE 0602314N (ONR UUV Technology Efforts)
(U) PE 0602315N (ONR UUV Technology Efforts)
(U) PE 0603226E/EE39 (ARPA UUV Technology Efforts)

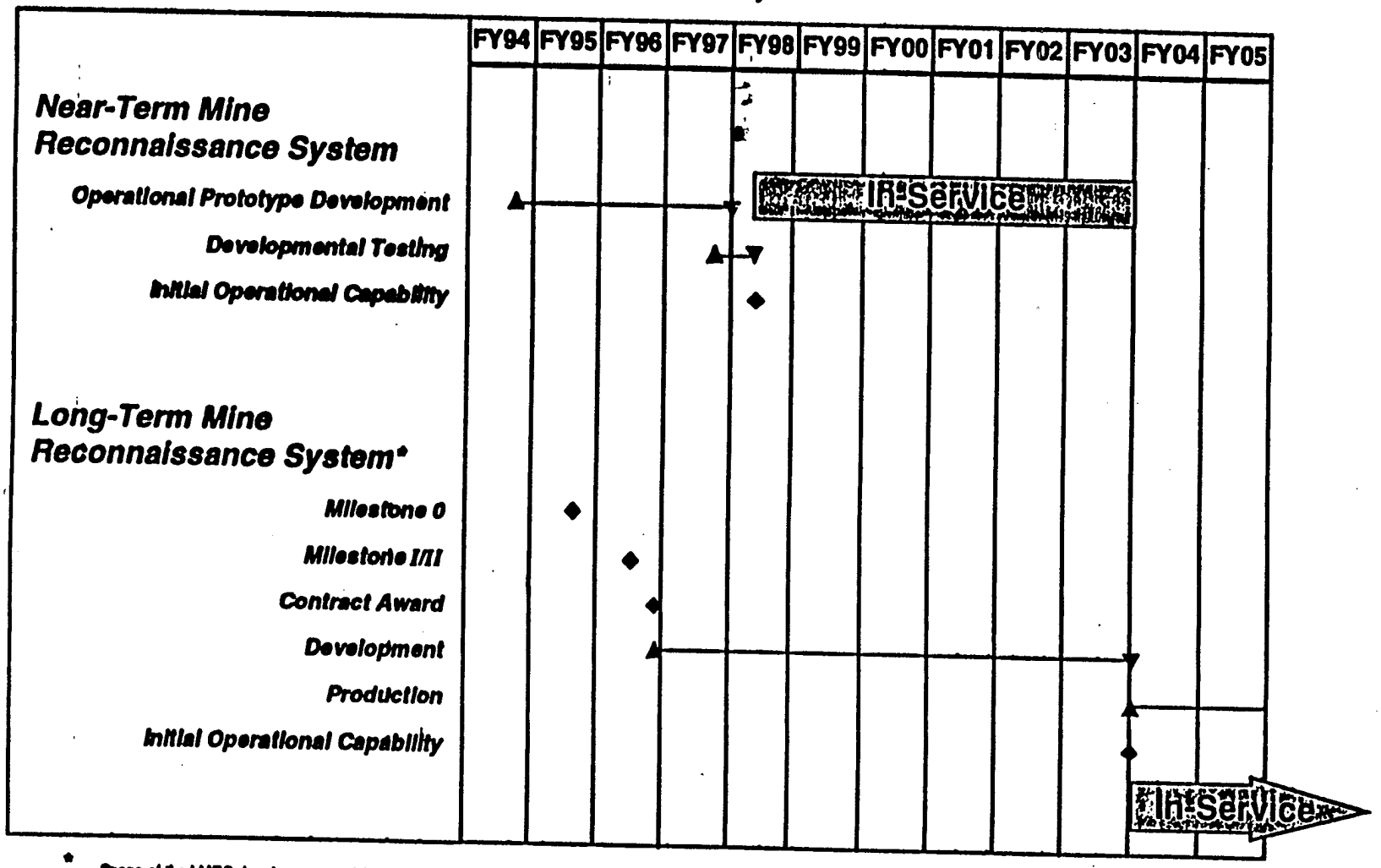
D. (U) SCHEDULE PROFILE: See attached.

Exhibit R-2

Unmanned Underwater Vehicle Program

Milestone Schedule

PE: 0603502N Proj: V2094



* Scope of the LMRS development activities will be determined by Milestone I/II when the acquisition strategy is approved by the Milestone Decision Authority

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4
PROGRAM ELEMENT: 0603502N
PROGRAM ELEMENT TITLE: Surface and Shallow Water Mine Countermeasures
PROJECT NUMBER: V2094
PROJECT TITLE: Unmanned Underwater Vehicle

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

Project Cost Categories	FY 1995	FY 1996	FY 1997
a. Primary Hardware Development	14,639	17,304	22,527
b. Contractor Engineering Support	1,412	650	850
c. Government Engineering Support	1,561	1,197	1,488
d. Program Management Support	233	334	435
e. Govt. Developmental Test and Evaluation	0	92	660
f. SBIR Assessment	0	419	0
Total	17,845	19,996	25,960

Exhibit R-3

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603502N PROJECT NUMBER: V2094
PROGRAM ELEMENT TITLE: Surface and Shallow Water Mine Countermeasures PROJECT TITLE: Unmanned Underwater Vehicle

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 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Product Development										
WEC/NMRS	SS/CPAF	08/94	39,902*	39,902*	789*	14,639	15,804	6,591	1,617	39,440
WEC - Westinghouse Electric Corporation, Electronic Systems Group, Annapolis MD										
TBD/LMRS	C/CPAF	08/96	TBD	TBD	0	0	1,500	15,936	CONT.	CONT.
JOHNS HOPKINS	SS/CPFF	01/95			1,400	1,412	650	850	CONT.	CONT.
NUWC/NPT	WR	11/94			1,085	1,561	1,197	1,488	CONT.	CONT.
Support and Management										
Miscellaneous	various	various			330	233	753	435	CONT.	CONT.
Test and Evaluation										
Miscellaneous	WR	10/95			0	0	92	660	CONT.	CONT.

GOVERNMENT FURNISHED PROPERTY - Not applicable.

* Note - $3,500K from P.E. 0603555N provided to NMRS contract in FY 94. Total contract EAC is $43,402K.

Exhibit R-3

000147

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4
PROGRAM ELEMENT: 0603502N
PROGRAM ELEMENT TITLE: Surface and Shallow Water Mine Countermeasures
PROJECT NUMBER: V2094
PROJECT TITLE: Unmanned Underwater Vehicle

	Total FY 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Subtotal Product Development	3,274	17,612	19,151	24,865	CONT.	CONT.
Subtotal Support and Management	330	233	753	435	CONT.	CONT.
Subtotal Test and Evaluation	0	0	92	660	CONT.	CONT.
Total Project	3,604	17,845	19,996	25,960	CONT.	CONT.

Exhibit R-3

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603506N
PROGRAM ELEMENT TITLE: Surface Ship Torpedo Defense

(U) COST: (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
V2045 Joint US/UK SSTD	20,353	9,714	5,772	1,845	2,409	3,150	3,132	CONT.	CONT.

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The SSTD Programs' phased development approach pursues six areas necessary for effective torpedo defense. The AN/SLR-24 subsystem is being developed to provide ships currently without ASW capability the ability to detect incoming torpedoes. This is accomplished using a towed array sensor, a detection unit for beamforming and signal processing, and a display and control unit to provide output data to the user. The Launched Expendable Acoustic Device (LEAD) will provide an effective countermeasure against acoustic homing torpedoes at a greater standoff distance. The Torpedo Alertment Processor (TAP) will provide a torpedo detection system for ships with an existing ASW capability. This will be accomplished by providing a new signal processing and beamforming electronics cabinet and using the ships' existing hull and towed sensors. The SSTD integrated system ensures the best use of countermeasures, tactics, and detection systems are planned and engineered for the best application on each ship class. Improved detection capabilities are being examined and include improved towed array sensors and potentially the use of sonobuoys. An improved expendable countermeasure is also being examined to provide a more robust expendable countermeasure. A separate technology program is focused on developing anti-torpedo vehicle technology in order to reduce risk for eventual incorporation into the overall Surface Ship Torpedo Defense system.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: The program is funded under DEMONSTRATION AND VALIDATION because it develops and integrates hardware for experimental test related to specific ship or aircraft applications.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603506N PROJECT NUMBER: V2045
PROGRAM ELEMENT TITLE: Surface Ship Torpedo Defense PROJECT TITLE: JT US/UK SSTD

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS:

- (U) ($1,455) Conducted consortium modeling and assessment efforts.
- (U) ($1,230) Conducted consortium processing and interface Combat Control (CC) upgrades efforts.
- (U) ($6,068) Conducted consortium countermeasures and Detection, Classification and Localization (DCL) processing enhancement studies, analysis, evaluation, and trial evaluations.
- (U) ($1,800) Funded Request for Equitable Adjustment (REA) to Alliant.
- (U) ($2,951) Continued Torpedo Alertment Hardware/Software Development.
- (U) ($4,650) Continued LEAD Development.
- (U) ($400) Completed AN/SLR-24 systems engineering, and hardware/software upgrades.
- (U) ($465) Completed AN/SLR-24 algorithm analysis, software upgrade, and simulation.
- (U) ($1,334) Conducted in-water tests for AN/SLR-24, TECHEVAL, and OPEVAL.

2. (U) FY 1996 PLAN:

- (U) ($750) Conduct in water test for LEAD, TECHEVAL, and OPEVAL.
- (U) ($750) Obtain Milestone III decision for LEAD.
- (U) ($1,599) Conduct Demonstration & Validation (D&V) Phase Subsystem Development and Analysis.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603506N PROJECT NUMBER: V2045
PROGRAM ELEMENT TITLE: Surface Ship Torpedo Defense PROJECT TITLE: JT US/UK SSTD

- (U) ($1,851) Conduct Test and Evaluation on Torpedo Alertment Processor.
- (U) ($4,323) Conduct Torpedo Alertment Processor Combatant Development and Integration.
- (U) ($350) Obtain Milestone III decision for AN/SLR-24.
- (U) ($91) Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15 U.S.C.638.

3. (U) FY 1997 PLAN:

- (U) ($2,060) Continue D&V Phase Subsystem Development.
- (U) ($1,300) Conduct Torpedo Alertment Follow-On Test and Evaluation (FOT&E) for First Echelon Units (FEUs).
- (U) ($2,412) Complete Torpedo Alertment Processor Combatant Integration.

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996 President's Budget:	20,460	10,049	7,758
(U) Adjustments from PRESBUDG:	-107	-335	-1,986
(U) FY 1997 PRESBUDG Submit:	20,353	9,714	5,772

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1995 reduction of -107K due to a program realignment of -11K and to the MRTFB fix in the amount of -96K. FY 1996 reduction of 335K is due to Congressional undistributed reductions. FY 1997 reduction of 1,986K is due to re-alignment of 1,550K to PE 0603564N and 436K for revised inflation estimates and other minor pricing adjustments.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603506N PROJECT NUMBER: V2045
PROGRAM ELEMENT TITLE: Surface Ship Torpedo Defense PROJECT TITLE: JT US/UK SSTD

(U) Schedule: Not applicable.

(U) Technical: FY 1996 reduction will reduce Torpedo Alertment Processor algorithm development efforts. FY 1997 reduction will significantly reduce program efforts, specifically testing requirements, supporting the current D&V contract.

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

	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
OPN Surface Ship Torpedo Defense									
P-1 Item 56	31,123	13,335	5,701	12,197	12,245	4,401	5,113	CONT.	CONT.

(U) RELATED RDT&E: Not applicable.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603506N PROJECT NUMBER: V2045
PROGRAM ELEMENT TITLE: Surface Ship Torpedo Defense PROJECT TITLE: JT US/UK SSTD

D. (U) SCHEDULE PROFILE:

	FY 1994	FY 1995	FY 1996	FY 1997	TO COMPLETE
Program Milestones	3Q LEAD MS II	1Q SSTD Integrated System MS I	1Q AN/SLR-24 MS III 4Q LEAD MS III		1Q 02 SSTD Integration MS II
Engineering Milestones		1Q TAP PDR	3Q TAP ECP for Combatants	3Q TAP ECP for FEUs	1Q 01 SSTD Integration Requirements Defined
T&E Milestones		1Q AN/SLR-24 DT II-A/B 3Q AN/SLR-24 TECHEVAL 4Q AN/SLR-24 OPEVAL 3Q TAP DT	3Q TAP FOT&E for combatants 2Q LEAD DT/OT	3Q TAP FOT&E for FEUs	4Q 07 SSTD Integration DT/OT
Contract Milestones	4Q LEAD Contract Initiation	1Q SSTD Integration D&V Award			1Q 02 SSTD Integration EMD Award

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FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603512N
PROGRAM ELEMENT TITLE: Carrier Systems Development

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
S1722 CV Weapons Elevator Improvements	1,191	1,003	506	883	1,036	1,034	1,055	CONT.	CONT.
W1723 CV Launch and Recovery Systems	14,002	3,095	2,231	3,352	4,148	4,122	4,177	CONT.	CONT.
S2208 Future CV R&D	500	8,272	6,017	1,800	1,774	1,758	1,745	CONT.	CONT.
W2269 EAF Matting	0	0	3,991	4,302	2,711	4,570	0	0	15,574
TOTAL	15,693	12,370	12,745	10,337	9,669	11,484	6,977	CONT.	CONT.

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This Navy unique program addresses all technology areas associated with Navy/Marine Corps aircraft operations aboard ships. The program includes:

(U) (S1722) Development of standardized, supportable and maintainable aircraft carrier (CV/CVN) weapons elevators components.

(U) (W1723) Development of all systems required to provide approach and landing guidance and control, recovery, service, support and launch aircraft operating onto or from ships. Payoffs include increased safety, greater sortie generation rates, enhanced aircraft boarding rates, reduced manning, increased aircraft service life and fleet modernization.

(U) (S2208) Development of ship hull, mechanical and electrical, aviation and combat support systems, subsystems and components to significantly improve aircraft carrier affordability, survivability and operation capabilities and to meet the requirements of existing and pending regulations and statutes critical to the operation of future aircraft carriers.

(U) (W2269) Development of lightweight mat and expeditionary arresting gear for use at Marine Corps Expeditionary Airfields (EAF).

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under DEMONSTRATION & VALIDATION because it develops and integrates hardware for experimental test related to specific ship or aircraft applications.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603512N
PROGRAM ELEMENT TITLE: Carrier Systems Development

(U) COST ($ in Thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
S1722 CV Weapons Elevator Improvements	1,191	1,003	506	883	1,036	1,034	1,055	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project provides for the advanced development, fabrication, test, evaluation and documentation of standardized aircraft carrier weapons elevators components such as control systems, hoist machinery, doors and hatches. Emphasis is placed on the improvement of safety, reliability, maintainability, watertight integrity and weight reduction.

(U) PROGRAM ACCOMPLISHMENT AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS:

- (U) ($ 78) Conducted prototype PLC testing.
- (U) ($350) Conducted shipboard test of MAPA software.
- (U) ($195) Completed wire rope test device evaluation.
- (U) ($238) Initiated variable speed AC drive specification development.
  ($155) Forward financing required for poor expenditures
- (U) ($249) Completed testing of solid state proximity switches.
- (U) ($ 76) Conducted evaluation of elevator circuit breakers.
- (U) ($ 5) NAWCWD support for weapons elevator and handling studies.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603512N PROJECT NUMBER: S1722
PROGRAM ELEMENT TITLE: Carrier Systems Development PROJECT TITLE: CV Weapons Elevator Improvements

2. (U) FY 1996 PLAN:

- (U) ($703) Develop and fabricate prototype variable speed AC drive system.
  ($155) Used to Forward Finance FY97 Program due to poor expenditures.
- (U) ($300) Develop advanced platform position sensor.

3. (U) FY 1997 PLAN:

- (U) ($260) Conduct variable speed AC drive tests on LBES.
- (U) ($246) Begin fabrication of Elevator Ballistic Watertight Hatch (EBWTH) on LBES.

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996 President's Budget:	1,191	1,033	719
(U) Adjustments from PRESBUDG:	0	-30	-213
(U) FY 1997 PRESBUDG Submit:	1,191	1,003	506

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1996 decrease due to Congressional undistributed general and inflation reductions; and revised DOD inflation rates and other minor pricing adjustments (-$30 thousand).

FY 1997 decrease due to revised inflation rates and other minor pricing adjustments (-$213 thousand).

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603512N PROJECT NUMBER: S1722
PROGRAM ELEMENT TITLE: Carrier Systems Development PROJECT TITLE: CV Weapons Elevator Improvements

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

(U) RELATED RDT&E: Not applicable.

D. (U) SCHEDULE PROFILE:

	FY 1995	FY 1996	FY 1997
Program Milestones	2Q Install MAPA Prototype	2Q Install AC Drive	
Engineering Milestones	4Q Identify AC Drive	3Q Develop Sensor	
T&E Milestones	4Q Wire Rope Test 4Q Complete Prox Switch Testing 4Q Test MAPA	3Q Begin AC Drive Test	2Q Complete AC Drive Test
Contract Milestones		1Q Procure AC Drive	4Q Fabricate EBWTH

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603512N
PROGRAM ELEMENT TITLE: Carrier Systems Development

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
W1723 CV Launch and Recovery Systems	14,002	3,095	2,231	3,352	4,148	4,122	4,177	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project addresses the Demonstration and Validation (DEMVAL) of advanced systems to meet Navy unique shipboard operational requirements for:

(U) DEMVAL of advanced systems to modernize catapults and arresting gear and shipboard support systems. This area is developing the Electromagnetic Aircraft Launch System (EMALS) including its associated power generation, storage and distribution system; closed loop control system; and continuation of previous efforts to integrate the EMALS with a ski-jump.

(U) DEMVAL of advanced optical, electro-optical and laser tracking, approach and landing control and guidance systems, and air operations reporting systems for pilots, Landing Signal Officers (LSO) and ship's crew. The Improved Carrier Optical Landing System (ICOLS), which includes the Improved Fresnel Lens Optical Landing System (IFLOLS) and the Long Range Line-up System (LRLS), will provide optical displays so that the pilot can take early corrective actions in order to prevent landing accidents and increase the aircraft boarding rate. The Integrated Shipboard Information System (ISIS) will provide automated air operations information to decision makers via electronic status boards, replacing the current manpower intensive, hand-written status boards in all of the air operations work areas. ISIS also includes supporting systems which will optimize the flow and processing of situational management information. The Virtual Imaging System for Approach and Landing (VISUAL) will provide the ship's company and pilots with enhanced images of the aircraft and ship, respectively, in low visibility and night conditions. The Shipboard Optical Landing System (SOLS) will provide advanced visual landing aids (VLA) for fixed wing, rotary wing and Vertical/Short Take-Off and Landing (VSTOL) aircraft, so that pilots can fly safer and more accurate approaches to all classes of ships. The Shipboard Wind Measurement System (SWMS) is being developed to provide more accurate wind speed and direction information to the ship's crew so that they can make better informed decisions affecting the safety of air operations onboard ships.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603512N PROJECT NUMBER: W1723
PROGRAM ELEMENT TITLE: Carrier Systems Development PROJECT TITLE: CV Launch & Recovery Systems

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS:

- (U) ($3,460) Completed Critical Component Demonstration (CCD) of EMALS Launch Engine.
- (U) ($2,860) Completed design of ICOLS IFLOLS ADM.
- (U) ($7,682) Completed shipboard evaluation of ISIS ADM and continued development of supporting situational management systems.

2. (U) FY 1996 PLAN:

- (U) ($298) Continue engineering support for the EMALS ADM.
- (U) ($2,776) Complete development of ISIS ADM supporting situational management systems and conduct Milestone II decision to proceed to Engineering and Manufacturing Development (E&MD).
- (U) ($21) Portion of program reserved for Small Business Innovation Research in accordance with 15 U.S.C.638(f)(1).

3. (U) FY 1997 PLAN:

- (U) ($775) Continue engineering support for the EMALS ADM.
- (U) ($1,456) Initiate development of the VISUAL ADM.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603512N PROJECT NUMBER: W1723
PROGRAM ELEMENT TITLE: Carrier Systems Development PROJECT TITLE: CV Launch & Recovery Systems

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996/1997 President's Budget:	14,002	3,193	3,427
(U) Adjustments from PRESBUDG:	0	(98)	(1,196)
(U) FY 1997 PRESBUDG Submit:	14,002	3,095	2,231

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding:

FY 1996 Reductions: Congressional undistributed general and inflation reductions; and revised DOD inflation rates and other minor pricing adjustments (-$98 thousand).
Reduced scope of EMALS ADM effort due to other higher priorities in the program.

FY 1997 Reductions: Revised inflation estimates and other minor pricing adjustments (-$1,196 thousand).

(U) Schedule: Planned initiation of SWMS delayed from FY-98 until FY-00.

(U) Technical: Not applicable.

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

(U) RELATED RDT&E:

(U) PE 0602122N (Aircraft Technology)

(U) PE 0604512N (Shipboard Aviation Systems)

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603512N PROJECT NUMBER: W1723
PROGRAM ELEMENT TITLE: Carrier Systems Development PROJECT TITLE: CV Launch & Recovery Systems

D. (U) SCHEDULE PROFILE:

	FY 1995	FY 1996	FY 1997	TO COMPLETE
Program Milestones		IFLOLS: 1Q MS II ISIS: 4Q MS II	VISUAL: 1Q MS I	EMALS: 98/1Q MSI SOLS: 99/1Q MSI VISUAL: 99/2Q MSII SWMS: 00/1Q MSI
Engineering Milestones			VISUAL: 4Q PDR	SOLS: 99/4Q PDR SWMS: 00/4Q PDR
T&E Milestones	EMALS: 4Q CCD ISIS: 3Q DEMVAL			VISUAL: 98/4Q DEMVAL SOLS: 01/4Q DEMVAL SWMS: 01/4Q DEMVAL
Contract Milestones				

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603512N PROJECT NUMBER: W1723
PROGRAM ELEMENT TITLE: Carrier Systems Development PROJECT TITLE: CV Launch & Recovery Sys

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

Project Cost Categories	FY 1995	FY 1996	FY 1997
a. Primary Hardware Development	8,930	1,817	1,339
b. Software Development	2,535	676	446
c. Integrated Logistics Support	1,268	277	200
d. Developmental Test & Evaluation	1,269	304	246
e. SBIR		21	
Total	14,002	3,095	2,231

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 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Product Development										
Naval Air Warfare Center Aircraft Division, Lakehurst, NJ										
NAWCAD-LKE	WR	9/30/95	N/A	N/A	34,104	11,062	2,495	2,031	CONT.	CONT.
Kaman Electromagnetics, Hudson, MA										
Kaman EM	CPFF	12/21/92	4,900	4,900	3,060	1,840	0	0	0	4,900

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0603512N PROGRAM ELEMENT TITLE: Carrier Systems Development PROJECT NUMBER: W1723 PROJECT TITLE: CV Launch & Recovery Sys

Miscellaneous, Navy Misc.	WR	9/30/95	32,432	32,432	31,132	900	400	0	0	32,432
Support and Management:					0	200	200	200	CONT.	CONT.

Test and Evaluation: Not applicable.

GOVERNMENT FURNISHED PROPERTY: Not applicable.

	Total FY 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Subtotal Product Development	68,296	13,802	2,895	2,031	CONT.	CONT.
Subtotal Support and Management	0	200	200	200	CONT.	CONT.
Subtotal Test and Evaluation	0	0	0	0	0	0
Total Project	68,296	14,002	3,095	2,231	CONT.	CONT.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603512N
PROGRAM ELEMENT TITLE: Carrier Systems Development

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
S2208 Future CV R&D	500	8,272	6,017	1,800	1,774	1,758	1,745	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project provides for the development of aircraft carrier (CV/CVN) specific technologies, the infusion of the surface ship technology base into future aircraft carriers and the potential realization of subsystem design capabilities not currently feasible. This project transitions the most promising technologies from the Navy technology base, other government laboratories, and the private sector into specific advanced development efforts. All systems developed in this project have the potential to support emerging requirements and other promising systems technologies for insertion into new aircraft carrier designs. The emphasis is directed toward developing ship hull, mechanical and electrical (H,M&E), aviation and combat support systems, sub-systems and components to significantly improve aircraft carrier affordability, survivability, and operational capabilities and to meet the requirements of existing and pending regulations and statutes critical to the operation of future aircraft carriers.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS:

- (U) ($500) Carrier Technology Assessment and Affordability: Initiated engineering assessment of alternative ship design concepts and technologies.

2. (U) FY 1996 PLAN:

- (U) ($4,687) Carrier Technology Assessment and Affordability: Continue engineering assessment of alternative ship design concepts, improve aircraft carrier design tools and assess aircraft carrier design criteria. Evaluate cost and capabilities of design concepts. Complete development of a comprehensive roadmap for future sea-based tactical aviation platforms. Continue assessment of design concepts of simplified systems for selected candidates from the electrical system, structural system, auxiliary and fluid systems and design concepts for selected standard, modular-packaged subsystems and components. Continue engineering assessment of candidate subsystems and components that could be made common with other surface and submarine subsystems and

components to reduce total Navy logistic support costs and simplify ship installation. Continue assessment of alternative propulsion system configurations. Continue development of selected auxiliary machinery modules to complement simplified distributive system architectures for improved affordability.

- (U) ($1,538) Initiated development of an Aviation Weapons Information Management System (AWIMS).
- (U) ($2,000) Initiated development of an advanced Zonal Electric Distribution System for aircraft carrier application (CV ZEDS).
- (U) ($47) Portion of extramural program reserved for Small Business Innovation Research (SBIR) assessment in accordance with 15 U.S.C.638.

3. (U) FY 1997 PLAN:

- (U) ($5,017) Carrier Technology Assessment and Affordability: Continue engineering assessment of alternative ship design concepts, improve aircraft carrier design tools and assess aircraft carrier design criteria. Evaluate cost and capabilities of design concepts. Complete development of a comprehensive roadmap for future sea-based tactical aviation platforms. Continue assessment of design concepts of simplified systems for selected candidates from the structural system, auxiliary and fluid systems and design concepts for selected standard, modular-packaged subsystems and components. Continue engineering assessment of candidate subsystems and components that could be made common with other surface and submarine subsystems and components to reduce total Navy logistic support costs and simplify ship installation. Continue assessment of alternative propulsion system configurations. Continue development of selected auxiliary machinery modules to complement simplified distributive system architectures for improved affordability.
- (U) ($ 500) Continue development of an Aviation Weapons Information Management System.
- (U) ($ 500) Continue development of an advanced Zonal Electric Distribution System for aircraft carrier application.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603512N PROJECT NUMBER: S2208
PROGRAM ELEMENT TITLE: Carrier Systems Development PROJECT TITLE: Future CV R&D

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996 President's Budget:	0	11,938	11,936
(U) Adjustments from PRESBUDG:	500	-3,666	-5,919
(U) FY 1997 PRESBUDG Submit:	500	8,272	6,017

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY1995 reflects addition of $500 thousand due to below threshold reprogramming action. FY 1996 reductions are Congressional undistributed general and inflation reductions (-$3,400 thousand); and revised DOD inflation rates and other minor pricing adjustments (-$266 thousand). FY 1997 reductions are revised inflation estimates and other minor pricing adjustments (-$5,919 thousand).

(U) Schedule: Delayed start of Multi-Threat Magazine Protection System and ski-jump development work to FY 1998 following Congressional adjustment in FY 1996, Navy budget redistribution in FY 1997, and inflation adjustments in FY 1997. Extended development schedule for AWIMS and CV ZEDS development due to delay in receipt of FY 1996 funds due to Budget negotiations, and due to inflation adjustment reduction in FY 1997.

(U) Technical: Not applicable.

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

	FY 1995 ESTIMATE	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
Not applicable.									

(U) RELATED RDT&E:

(U) PE 0604512N Shipboard Aviation Systems
(U) PE 0603573N Advanced Surface Machinery Systems

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

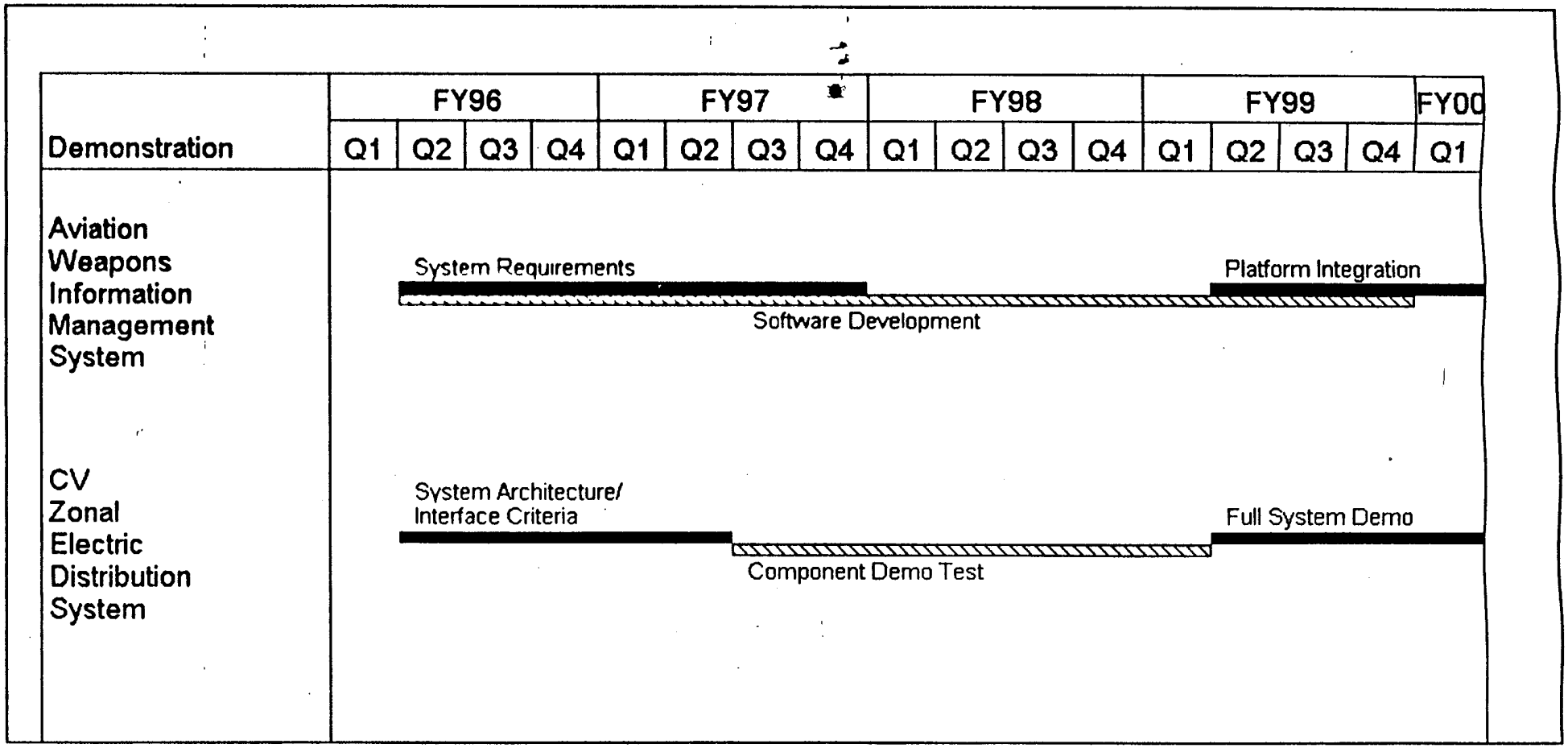
DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603512N
PROGRAM ELEMENT TITLE: Carrier Systems Development

PROJECT NUMBER: S2208
PROJECT TITLE: Future CV R&D

D. (U) SCHEDULE PROFILE:



FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603512N PROJECT NUMBER: S2208
PROGRAM ELEMENT TITLE: Carrier Systems Development PROJECT TITLE: Future CV R&D

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

Project Cost Categories	FY 1995	FY 1996	FY 1997
a. Primary Hardware Development	0	0	0
b. Ancillary Hardware Development	0	0	0
c. Development Support Equipment Acquisition	0	0	0
d. Research Support Equipment Acquisition	0	0	0
e. Software Development	0	400	300
f. Systems Engineering	500	7,387	5,202
g. Demonstration Testing	0	0	0
h. Development Test and Evaluation	0	0	0
i. Program Management Support	0	0	0
j. Travel	0	15	15
k. Miscellaneous	0	423	500
l. SBIR	0	47	0
Total	500	8,272	6,017

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603512N PROJECT NUMBER: S2208
PROGRAM ELEMENT TITLE: Carrier Systems Development PROJECT TITLE: Future CV R&D

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 1994 & Prior	FY 1995 Actual	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Product Development										
Naval Surface Warfare Center, Carderock Division, Bethesda, MD										
NSWC/CD	WR	Feb 96	CONT.	CONT.	0	38	2,661	1,500	CONT.	CONT.
Naval Surface Warfare Center, Dahlgren Division, Dahlgren, VA										
NSWC/DD	WR	Feb 96	CONT.	CONT.	0	0	750	750	CONT.	CONT.
Naval Air Warfare Center, Aircraft Division, Lakehurst, NJ										
NAWCAD/LKE	WR	Feb 96	CONT.	CONT.	0	0	1,588	1,000	CONT.	CONT.
Naval Research and Development Division, San Diego, CA										
NRaD	WR	Feb 96	CONT.	CONT.	0	20	200	500	CONT.	CONT.
Contractors										
Misc.	Misc.	Feb 96	CONT.	CONT.	0	327	2,751	1,452	CONT.	CONT.
Miscellaneous										
Misc.	Misc.	Feb 96	CONT.	CONT.	0	115	260	800	CONT.	CONT.
Support and Management										
Miscellaneous										
Misc.	Misc.	Jan 96	CONT.	CONT.	0	0	15	15	CONT.	CONT.
SBIR										
Misc.	Misc.	Jan 96	47	47	0	0	47	0	0	47
Test and Evaluation	Not applicable.									

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603512N PROJECT NUMBER: S2208
PROGRAM ELEMENT TITLE: Carrier Systems Development PROJECT TITLE: Future CV R&D

GOVERNMENT FURNISHED PROPERTY:

Item Description	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Delivery Date
Product Development	Not applicable.		
Support and Management	Not applicable.		
Test and Evaluation	Not applicable.		

	Total FY 1994 & Prior	FY 1995 Actual	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Subtotal Product Development	0	500	8,210	6,002	CONT.	CONT.
Subtotal Support and Management	0	0	62	15	CONT.	CONT.
Subtotal Test and Evaluation	0	0	0	0	CONT.	CONT.
Total Project	0	500	8,272	6,017	CONT.	CONT.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603512N
PROGRAM ELEMENT TITLE: Carrier Systems Development

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
W2269 EAF Matting	0	0	3,991	4,302	2,711	4,570	0	0	15,574

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project addresses the Demonstration and Validation (DEMVAL) of lightweight airfield mat and expeditionary arresting gear to meet naval aviation unique Expeditionary Airfield (EAF) operational requirements including transportability requirements on Maritime Prepositioning Ships (MPS).

The EAF mat presently available (AM-2) was developed for heavy fighter aircraft operations, such as the F-4, and is heavy and cumbersome to deploy. Potentially lightweight (1/2 the weight of AM-2) and less voluminous (1/2 the volume of AM-2) mat material may be technically feasible and commercially available, but the potential materials must be evaluated for use with current type/model/series naval and Air Mobility Command (AMC) aircraft at Vertical and Short Take-Off and Landing (VSTOL) airfields ashore. Current aluminum matting requires approximately 15 days to install a complete airfield. Potential material will meet Marine Corps requirements to install complete airfield in five days or less. Candidate mat material under consideration for continuation of this on-going evaluation program include reinforced synthetic composite materials and polyvinyl fiberglass. These mat materials will be configured and evaluated for the Marine Corps operational scenarios.

The expeditionary arresting gear program will provide the Marine Corps with the capability to conduct short span arrestments of all Navy and Marine Corps tail hook aircraft in the expeditionary environment. The current M-21 arresting gear cannot be adapted to operate on short span (less than 100 feet) surfaces and is incapable of arresting the full inventory of aircraft under casualty (no flaps or half flap) conditions. Installation of the M-21 requires 24 hours, extensive excavation and heavy support equipment. The M-21 has inadequate reliability and several replacement components are no longer produced. The replacement gear will provide transportability, rapid setup, full inventory operational capability under all arrestment conditions, and adequate operational reliability.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS: Not applicable.

2. (U) FY 1996 PLAN: Not applicable.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603512N PROGRAM ELEMENT TITLE: Carrier Systems Development PROJECT NUMBER: W2269 PROJECT TITLE: EAF Matting

3. (U) FY 1997 PLAN:

- (U) ($ 216) Procure limited amounts of candidate mat, test materials for EAF landing sites.
- (U) ($3,775) Validate absorber, tape and cross deck pendant design and performance. Develop system requirements for mobility, auxiliary and anchoring subsystems prior to integration and demonstration of full system capability.

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996/1997 President's Budget:	0	0	0
(U) Adjustments from PRESBUDG:	0	0	3,991
(U) FY 1997 PRESBUDG Submit:	0	0	3,991

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding:

FY 1997 Additions: $216 thousand to reinstate the previously funded mat program and $3,775 thousand to initiate the expeditionary arresting gear program by reprogramming EAF OPN funds.

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

C. (U) OTHER PROGRAM FUNDING SUMMARY: EAF OPN (PE 0206139M)	2,483	4,778	1,560

(U) RELATED RDT&E: Not applicable.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603512N
PROGRAM ELEMENT TITLE: Carrier Systems Development

PROJECT NUMBER: W2269
PROJECT TITLE: EAF Matting

D. (U) SCHEDULE PROFILE:

	FY 1995	FY 1996	FY 1997	TO COMPLETE
Program Milestones			A/G: 1Q MS I Mat: 2Q MS I	Mat: 00/1Q MS II A/G: 01/1Q MS II
Engineering Milestones				
T&E Milestones			Mat: 4Q DEMVAL A/G: 4Q Subsys Test	A/G: 00/4Q DEMVAL
Contract Milestones			A/G: 2Q Contract Award Mat: 2Q Contract Award	

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603512N PROJECT NUMBER: W2269
PROGRAM ELEMENT TITLE: Carrier Systems Development PROJECT TITLE: EAF Matting

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

Project Cost Categories	FY 1995	FY 1996	FY 1997
a. Primary Hardware Development	0	0	3,723
b. Software Development	0	0	0
c. Integrated Logistics Support	0	0	268
d. Developmental Test & Evaluation	0	0	0
Total	0	0	3,991

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 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Product Development										
Naval Air Warfare Center Aircraft Division, Lakehurst, NJ										
NAWCAD-LKE	WR	9/30/96	N/A	N/A	0	0	0	1,474	6,304	7,778
TBD										
TBD	CPFF	3/31/97	7,796	7,796	0	0	0	2,517	5,279	7,796
Support and Management: Not Applicable.					0	0	0	0	0	0

Test and Evaluation: Not applicable.

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0603512N PROJECT NUMBER: W2269
PROGRAM ELEMENT TITLE: Carrier Systems Development PROJECT TITLE: EAF Matting

GOVERNMENT FURNISHED PROPERTY: Not applicable.

	Total FY 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Subtotal Product Development	0	0	0	3,991	11,583	15,574
Subtotal Support and Management	0	0	0	0	0	0
Subtotal Test and Evaluation	0	0	0	0	0	0
Total Project	0	0	0	3,991	11,583	15,574

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603513N
PROGRAM ELEMENT TITLE: Shipboard Systems Component Development

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
S0382 - Shipboard Auxiliary Systems Development	20,548	14,378	8,291	12,148	20,227	20,413	15,713	CONT.	CONT.
S1712 - Hull, Mechanical & Electrical Improvement	5,092	1,902	1,657	5,094	4,733	6,399	8,583	CONT.	CONT.
TOTAL	25,640	16,280	9,948	17,242	24,960	26,812	24,296	CONT.	CONT.

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This program develops affordable non-propulsion machinery systems, components, and improvements for current and future surface fleet Hull, Mechanical and Electrical (HM&E) systems. It includes auxiliary machinery, hull and deck machinery, Fiber Optic (FO) systems, shipboard corrosion control, HM&E materials, Underway Replenishment (UNREP), and ship salvage systems. The integrated topside design portion of this program element develops and integrates the necessary technologies to achieve a total integrated topside architecture focused on future surface combatant ships. Technology areas including topside signature control, sensor and antenna integration, weapon system integration, HM&E integration, related decision making tools, and composite materials will be addressed. Other stand alone technology programs will be synergistically integrated with the topside design integration effort to assure total ship systems integration for future ship design efforts. Surface combatants will need an added (stealth) layer of defense to support hardkill and softkill systems in defeating future threats. Composite materials will be considered for their corrosion control and reduced maintenance attributes. Fiber optics development includes the distributed combat systems under the Integrated Interior Communication and Control ((IC)2) total shipwide network engineering, Fiber Optic Data Multiplexing System (FODMS (1) & (2)), fiber optic shipboard cable topology, analog and digital optoelectronic interfaces, passive optical sensors, and local area network installation projects.

(U) The program is closely coordinated with Advanced Surface Machinery Program (ASMP), formerly Integrated Electric Drive. The program does not duplicate any efforts and is independent of ASMP.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603513N
PROGRAM ELEMENT TITLE: Shipboard Systems Component Development

(U) System developments in the Shipboard Auxiliary Systems Development Project (S0382) are usually ACAT IVT or IVM. The HM&E Improvement Project (S1712) is non-ACAT, resulting primarily in new specifications, standards, and operating procedures. The program uses technology from industry and Navy exploratory development programs, evaluates breadboard units in the laboratory, and develops prototype equipment for technical and operational evaluation in Navy platforms and facilities. Thrusts are directed towards improved affordability, performance, producibility, service life, reliability and maintainability, signature reduction, safety, commonality, and standardization, and towards reduced life cycle and acquisition costs, and reductions in weight, volume, and manning. Systems generally apply to all ships and many components may be backfitted during overhauls or equipment replacements, or implemented relatively late in a new ship design cycle. This presents many windows of opportunity to transition technology to the current and future fleet.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under demonstration and validation because it develops and integrates hardware for experimental test related to specific ship or aircraft applications.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603513N
PROGRAM ELEMENT TITLE: Shipboard Systems Component Development

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
S0382 - Shipboard Auxiliary Systems Development	20,548	14,378	8,291	12,148	20,227	20,413	15,713	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project primarily supports ACAT IV projects that develop shipboard fiber optics and auxiliary machinery components and systems to improve affordability, performance, reliability, and maintainability and result in size, weight, and/or acquisition and life cycle cost savings. The auxiliary machinery HM&E developments include standard commercial based components applying new technology which provide the existing and future fleet affordability through reductions in logistics piece part proliferation including low and high pressure air systems, pumps, and advanced water systems to make and disinfect potable water. The project addresses development of machinery and systems architectures to reduce future ship acquisition and operating costs with advanced machinery, power for pulsed system loads, advanced degaussing, controllers, solid state power electronics, new underway replenishment concepts and salvage systems. Fiber Optic Topology provides the criteria and specifications for the design, implementation and installation of the physical cable plant on board ship to support data transmission requirements. Fiber optic sensors measure parameters such as pressure, temperature, speed (revolutions per minute) and physical separation (limit switches). This program area also provides performance specifications for shipboard use. $(IC)^2$ will coordinate and integrate the development of hardware and software to provide a total-ship interior communications system for voice, video, and data based on standard open architecture networks.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603513N PROGRAM ELEMENT TITLE: Shipboard Systems Component Development PROJECT NUMBER: S0382 PROJECT TITLE: Shipboard Auxiliary Systems Development

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS:

- (U) ($7,499) Transitioned advanced composite materials, corrosion control techniques and coatings to S1712 and continued development of advanced HM&E auxiliary machinery systems components and shipboard salvage systems. Completed Labeval of commercial point-of-use HP compressor. Conducted Labeval of standard composite centrifugal pumps. Conducted Electrolytic Disinfectant Generator (EDG) Reliability Development Growth Test, identified design modifications and rescheduled Shipeval/Techeval and MS III. Initiated functional analyses to quantify affordability benefits of applying advanced concepts to HM&E systems to apply automation and remote monitoring to reduce ship size and costs with reduced manning and developed advanced machinery plan. HM&E projects pursued to reduce acquisition and operating costs of future combatants include fuel cells, advanced degaussing, solid state power electronic modules, power for pulsed system loads, and controls for HM&E equipment. Defined requirements for high pressure membrane dehydrator, nitrogen generation, and positive displacement pump. Completed design and construction of amphibious ship advanced magnetic model. Initiated cost benefit analysis of existing militarized auxiliary machinery (i.e., EDG, RO) versus commercial machinery packaged for shipboard service. Completed Reverse Osmosis (RO) testing and finalized drawings.

- (U) ($500) Continued development of the Remotely Operated Vehicle Umbilical Splicing Systems and initiated development of the Underwater Inspection Sensor System. Completed development of "weak link" for towing unmanned, defueled Nuclear Submarine for deactivation.

- (U) ($12,549) Completed draft (IC)2 total ship systems integration process documentation and began implementation on LPD-17 baseline design. Completed switched Fiber Distributed Data Interface (FDDI) security architecture and verified installed components performance in (IC)2 developmental laboratory. Completed installation and verified functionality of Developmental Combat Control Network. Completed Application Program Interface (API) requirements specification. Completed Qualified Products List testing on fiber optic components including optical cable, IC boxes, locking ST connectors, and rotary splices. Developed commercialization plan to comply with DoD's acquisition reform initiative. Produced a generic approach for conversion of shipboard radio frequency waveguides to fiber optic cable links. Completed class baseline Fiber Optic Cable Plant ShipAlt package. Obtained Low Rate Initial Production approval for FODMS(1) and transitioned it to production.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603513N PROGRAM ELEMENT TITLE: Shipboard Systems Component Development PROJECT NUMBER: S0382 PROJECT TITLE: Shipboard Auxiliary Systems Development

Completed performance specification for pressure, temperature, limit switch and rotational speed optical sensors. Executed advanced optical multiplexing demonstration. Completed Autonomic Ship Function (ASF) Program Plan.

2. (U) FY 1996 PLAN:

- (U) ($8,638) Continue development of advanced affordable HM&E auxiliary machinery systems, components and shipboard salvage systems. Develop "packaging" technology for commercial equipment in military environment. Conduct Techeval of standard family composite centrifugal pumps. Continue development of advanced auxiliary machinery and systems to reduce operational costs and manning and improve responsiveness of future surface combatants including new equipment designs, system behavior and control models, diagnostic and prognostic methodologies, advanced controllers, sensors, software and maintenance methods including fuel cells, ship service generator sets, polymer current limiter, and advanced degaussing systems. Complete evaluation of amphibious ship physical/analytical magnetic modeling. Continue development of power electronic modules, switchgear and initiate simulated based design of in-theater replenishment concepts. Award contracts for prototype polymer current limiters, power electronic building block (PEBB) brassboard, and demonstrate HP membrane dehydrator. Complete Labeval and commence Shipeval/Techeval of EDG.

- (U) ($5,176) Verify and document (IC)2 interfaces for combat system components, machinery control system components and Joint Maritime Command Information System (JMCIS). Continue implementing the (IC)2 total ship systems integration process on the LPD-17 baseline design. Maintain distributed (IC)2 engineering and integration developmental facility and support potential user system development. Develop Life Cycle Management Plan and Configuration Management Plan for shipboard fiber optic networks. Continue development of design guidelines for generic fiber optic topology including high capacity single mode cable and components and cable plant design for new construction ships and selected backfit ships. Continue qualification of new fiber optic network components. Complete development of passive optical sensors. Complete development and testing of the fiber optic Topology Design Tool capable of providing a three-dimensional ship model including compartmentation, high risk/sensitive zones and structures, equipment and cable ways. Continue transitioning (IC)2 technology to support ASF implementation.

- (U) ($465) Complete the development of Remotely Operated Vehicle (ROV) Umbilical Splicing System; continue development of Underwater Inspection Sensors; initiate and complete the ROV Power System Study; and initiate and complete the Towline Extreme Tension Model for POSSE and USN Tow Manual.

- (U) ($99) Portion of extramural program reserved for Small Business Innovation Research Assessment in accordance with 15 U.S.C. 638.

3. (U) FY 1997 PLAN:

- (U) ($5,554) Continue development of advanced machinery for HM&E systems to reduce operational, manning, and maintenance costs. Labeval prototype high pressure membrane dehydrator. Finalize advanced auxiliary machinery and system designs and initiate demonstration of equipment maintenance and operation methods. Begin development of advanced machinery/system integration software. Continue development of PEBB modules, fuel cells, and packaged commercial equipment for military use. Complete EDG Techeval and obtain MS III approval. Transition magnetic silencing technology for steel hull surface ships; including closed loop degaussing.

- (U) ($2,487) Continue evaluation of new fiber optic components. Complete engineering, integration and validation of the combat system, HM&E, engineering, logistics, and administrative networks. Maintain distributed (IC)2 engineering and integration developmental facility. Support design of potential user system utilizing the developmental facility. Support design of potential user system utilizing the developmental (IC)2 backbone. Investigate shipboard application of Asynchronous Transfer Mode technology. Continue development of design guidelines for generic fiber optic topology and cable plant. Develop installation, connectorization, and test tools/methods for high density fiber optic cables. Investigate shipboard applications of photonics and single mode fiber. Support shipboard (IC)2 demonstrations of ASF functional elements.

- (U) ($250) Complete development of Underwater Inspection Sensors, and initiate development of underwater closed cycle blasting system.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603513N PROGRAM ELEMENT TITLE: Shipboard Systems Component Development PROJECT NUMBER: S0382 PROJECT TITLE: Shipboard Auxiliary Systems Development

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996 President's Budget:	20,780	14,843	11,981
(U) Adjustments from PRESBUDG:	-232	-465	-3,690
(U) FY 1997 PRESBUDG Submit:	20,548	14,378	8,291

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: The $232K decrease in FY95 funding is for University research and SBIR. The $465K reduction in FY96 funding is a result of congressional undistributed general and inflation reductions. The $3690K decrease in FY97 funding is a combination of reductions in ship design requirements ($3,033K) and revised inflation estimates and other minor pricing adjustments.

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

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

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4
PROGRAM ELEMENT: 0603513N
PROGRAM ELEMENT TITLE: Shipboard Systems Component Development
PROJECT NUMBER: S0382
PROJECT TITLE: Shipboard Auxiliary Systems Development

(U) RELATED RDT&E:

(U) PE0602121N, Surface Ship Technology
(U) PE0603555N, Undersea Superiority Technical Demonstration
(U) PE0603573N, Advanced Surface Machinery Program (ASMP)

D. (U) SCHEDULE PROFILE: SEE ATTACHED

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4
PROGRAM ELEMENT: 0603513N
PROGRAM ELEMENT TITLE: Shipboard Systems Component Development
PROJECT NUMBER: S0382
PROJECT TITLE: Shipboard Auxiliary Systems Development

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

Project Cost Categories	FY 1995	FY 1996	FY 1997
a. Fiber Optic	12,549	5,176	2,487
b. Auxiliary Machinery	7,499	8,638	5,554
c. Salvage	500	465	250
d. Materials	0	0	0
e. SBIR	--	99	--
Total	20,548	14,378	8,291

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603513N PROGRAM ELEMENT TITLE: Shipboard Systems Component Development PROJECT NUMBER: S0382 PROJECT TITLE: Shipboard Auxiliary Systems 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 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Product Development										
Ingersoll- Dresser Pump Philipsburg, NJ	C/CPFF	3/92			3,745	1430	485	0	0	5,600
ElTech International Cleveland, OH	C/CPFF	12/88			2,917	553	340	125	0	3,935
Rockwell International Anaheim, CA	SS/CPFF	7/92			7,482	0	0	0	0	7,482
TBD	C/CPFF	Various			0	1,423	2,050	0	0	3,473
Misc Contracts	Various	Various			3,885	3,751	4,872	2,875	CONT.	CONT.
NSWC, Dahlgren	WR	Various			5,191	1,000	0	0	0	6,191
NWS, Yorktown	WR	Various			7,648	0	0	0	0	7,648
NUWC, Norfolk	WR	Various			1,000	0	0	0	0	1,000
NSWC, Annapolis	WR	Various			4,868	3,300	3,446	3,720	CONT.	CONT.

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603513N
PROGRAM ELEMENT TITLE: Shipboard Systems Component Development

PROJECT NUMBER: S0382
PROJECT TITLE: Shipboard Auxiliary Systems Development

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Misc Govt Labs	WR	Various			16,372	9,091	3,185	1,571	CONT.	CONT.
Support and Management Miscellaneous	C/CPFF	Various			159	0	0	0	0	0

Test and Evaluation Not applicable.

Government Furnished Property Not applicable.

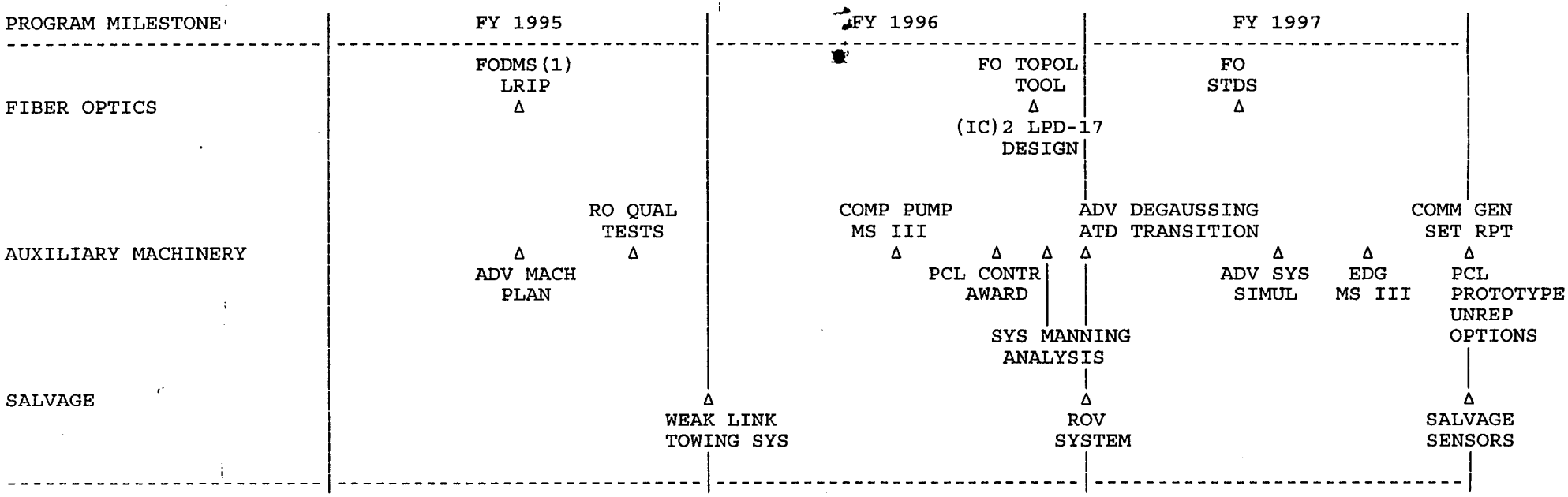
FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4
PROGRAM ELEMENT: 0603513N
PROGRAM ELEMENT TITLE: Shipboard Systems Component Development
PROJECT NUMBER: S0382
PROJECT TITLE: Shipboard Auxiliary Systems Development

	Total FY 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Subtotal Product Development	53,108	20,548	14,378	8,291	CONT.	CONT.
Subtotal Support and Management	159	0	0	0	0	0
Subtotal Test and Evaluation	0	0	0	0	0	0
Total Project	53,267	20,548	14,378	8,291	CONT.	CONT.

SCHEDULE PROFILE

0603513N, SHIPBOARD AUXILIARY SYSTEMS DEVELOPMENT, S0382



FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603513N
PROGRAM ELEMENT TITLE: Shipboard Systems Component Development

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
S1712 - Hull, Mechanical & Electrical Improvement	5,092	1,902	1,657	5,094	4,733	6,399	8,583	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project is non-ACAT and develops improved equipments which are small but critical components of non-propulsion HM&E systems. The program is directed toward improved affordability, performance, reduced life cycle cost, reliability and maintainability, signature reduction, standardization, and weight and manning reductions for the existing and future fleet. The integrated topside design portion of this program element develops and integrates the necessary technologies to achieve a total integrated topside architecture focused on future surface combatant ships. Technology areas including topside signature control, sensor and antenna integration, weapon system integration, HM&E integration, related decision making tools, and composite materials will be addressed. Other stand alone technology programs will be synergistically integrated with this topside design integration effort to assure total ship systems integration for future ship design efforts. Surface combatants will need an added (stealth) layer of defense to support hardkill and softkill systems in defeating future threats. Composite materials will also be considered for their corrosion control and reduced maintenance attributes.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS:

- (U) ($2,179) Labeval prototype standard Glass Reinforced Plastic (GRP) valves. Completed zonal firemain, advanced ship service air system survivability analyses and designs for future combatants, auxiliaries, and amphibious ships. Demonstrated proof of concept alternate starting system for Ship Service Generator Set (SS GenSet). Labeval/Shipeval ship service prototype low pressure membrane dehydrators. Completed phase I trade-off analysis for replacement for SS GenSet. Continued to evaluate advanced power cables and auxiliary electrical system components. Completed simulation based Labeval standard helo hangar door for DDG-51 IIA. Continued development of hull & deck low speed/high torque winch, Baxter bolts, elevator load testing, and synthetic batter boards/decking and wire rope sockets. Continued development of fluid, mechanical, electrical components, and weather deck machinery components, for reduced signatures, manning, and improved maintenance.

Transitioned Positive Displacement (PD) pump and High Pressure (HP) membrane dehydrator to S0382. Completed TAGS 60 trial and validated math model. Completed polymer current limiter feasibility studies and initiated prototype procurement. Initiated evaluation of commercial variable speed motor controllers and variable capacity auxiliary systems and components including composite valves for seawater systems. Completed fabrication of amphibious ship physical model and initiated validation of magnetic signature predictions. Continued degaussing power supply development.

- (U) ($2,913) Transition, from S0382. Designed and fabricated load bearing deckhouse components with integrated fiber reinforced composites and combat systems sensor technology. Integrated sensor system into the load bearing structure. Assessed performance and shipboard requirements that define the use of composite materials technology for future surface ship topside design, and developed a program plan for the integration of composite materials into topside designs. Supported installation of and initiated Shipeval of composite ventilation ducting on CG73. Identified corrosion control technologies. Initiated development of commercially based Navy composite ventilation ducting to meet shipboard technical requirements. Developed second generation, PC based composite materials properties database.

2. (U) FY 1996 PLAN:

- (U) ($1,363) Continue development of advanced affordable, mechanical, electrical, and hull and deck auxiliary machinery including variable capacity auxiliary system architectures, motors, controls, and components including alternative piping and valve specs and standards and new affordable efficient ships service power generation. Labeval alternative propulsion diesel engine starting system. Continue Labeval and Shipeval of prototype standard GRP ball valves and finalize specifications and standards. Complete low pressure membrane dehydrator evaluations, design and specifications. Complete cost benefit analysis for variable speed auxiliaries and systems.

- (U) ($534) Establish initial approach to reduce signatures of all topside systems. Measure the significant signature components (combat, communications, and HM&E) to determine where the most critical improvements need to be made for current systems. Continue topside design requirement definition, technology assessments, and composites implementation plan to address mission needs. Complete evaluation of integrated composite structure/sensor task. Composite materials will be considered for their corrosion control and reduced maintenance attributes.

- (U) ($5) Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with U.S.C. 638.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603513N PROGRAM ELEMENT TITLE: Shipboard Systems Component Development PROJECT NUMBER: S1712 PROJECT TITLE: HM&E Improvement

3. (U) FY 1997 PLAN:

- (U) ($746) Continue development of affordable mechanical, electrical and hull and deck machinery. Labeval variable capacity mechanical and electrical system components. Complete development of Navy Standard Composite Ball Valves, trade off analysis ship impact study of affordable efficient ships service power generation. Complete Labeval of alternate diesel starting systems. Initiate development of underway replenishment hauling winches.

- (U) ($911) Complete long-term project plan that defines design tools, signature data, subcomponents, components, and full scale prototypes necessary to demonstrate topside design integration concepts, including composite materials for future surface combatants. Establish the total signature budget for the next generation surface combatant systems and subsystems that distributes the signature over the platform. Composite materials will be considered for their corrosion control and reduced maintenance attributes.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603513N PROGRAM ELEMENT TITLE: Shipboard Systems Component Development PROJECT NUMBER: S1712 PROJECT TITLE: HM&E Improvement

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996 President's Budget:	5,150	1,961	1,742
(U) Adjustments from PRESBUDG:	-58	-59	-85
(U) FY 1997 PRESBUDG Submit:	5,092	1,902	1,657

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: The $58K FY95 funding decrease is for University research and SBIR. The $59K decrease in FY96 was for congressional undistributed general and inflation reductions and the $85K decrease in FY97 was for revised inflation estimates and other minor pricing adjustments.

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4
PROGRAM ELEMENT: 0603513N
PROGRAM ELEMENT TITLE: Shipboard Systems Component Development
PROJECT NUMBER: S1712
PROJECT TITLE: HM&E Improvement

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

(U) RELATED RDT&E:

(U) PE0602121N, Surface Ship Technology
(U) PE0603573N, Advanced Surface Machinery Program (ASMP)

D. (U) SCHEDULE PROFILE: SEE ATTACHED

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4
PROGRAM ELEMENT: 0603513N
PROGRAM ELEMENT TITLE: Shipboard Systems Component Development
PROJECT NUMBER: S1712
PROJECT TITLE: HM&E Improvement

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

Project Cost Categories	FY 1995	FY 1996	FY 1997
a. Auxiliary Machinery	2,179	1,363	746
b. Advanced Composite Materials	2,913	534	911
c. SBIR	--	5	--
Total	5,092	1,902	1,657

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603513N PROJECT NUMBER: S1712
PROGRAM ELEMENT TITLE: Shipboard Systems Component Development PROJECT TITLE: HM&E 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 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Product Development										
NSWC, Carderock	WR	Various			5,050	2,240	762	895	CONT.	CONT.
Misc Govt Labs					1,742	1,352	378	200	CONT.	CONT.
Misc Contracts	C/Various	TBD			1,511	1,500	762	562	CONT.	CONT.

Support and Management Not applicable.

Test and Evaluation Not applicable.

Government Furnished Property Not applicable.

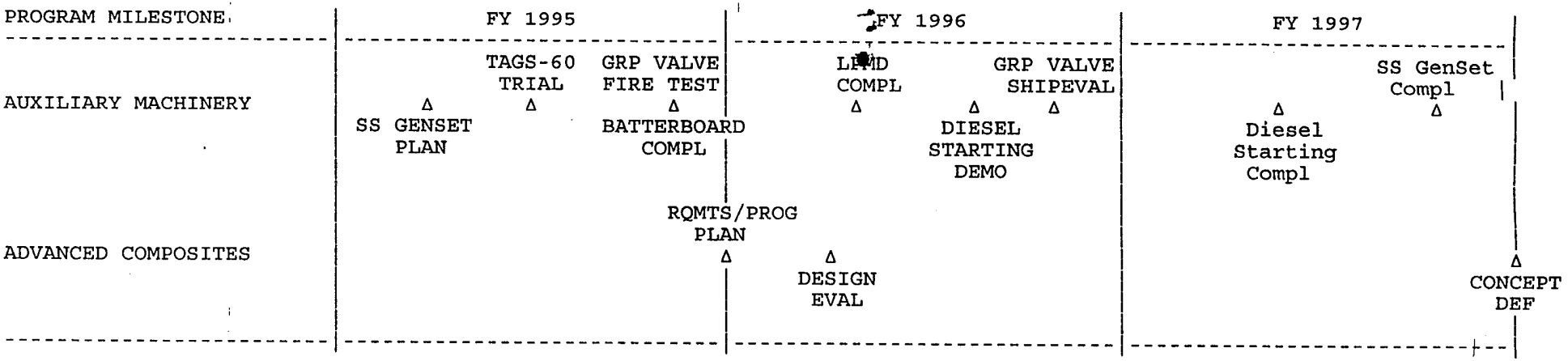
FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4
PROGRAM ELEMENT: 0603513N
PROGRAM ELEMENT TITLE: Shipboard Systems Component Development
PROJECT NUMBER: S1712
PROJECT TITLE: HM&E Improvement

	Total FY 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Subtotal Product Development	8,303	5,092	1,902	1,657	CONT.	CONT.
Subtotal Support and Management	0	0	0	0	0	0
Subtotal Test and Evaluation	0	0	0	0	0	0
Total Project	8,303	5,092	1,902	1,657	CONT.	CONT.

SCHEDULED PROFILE

0603513N, HULL, MECHANICAL, & ELECTRICAL IMPROVEMENT, S1712



FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603514N
PROGRAM ELEMENT TITLE: Ship Combat Survivability

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
S0384 Combat Survivability Design	3,232	2,972	1,502	2,059	2,120	2,106	2,151	CONT.	CONT.
S1121 Personnel Protection	2,840	2,422	1,894	2,142	2,513	2,509	2,566	CONT.	CONT.
S1565 Fire Protection/Damage Control Systems	6,269	5,894	2,353	5,048	5,683	5,666	5,791	CONT.	CONT.
S2053 CBR Defense	1,808	0	0	0	0	0	0	0	21,000
TOTAL	14,149	11,288	5,749	9,249	10,316	10,281	10,508	CONT.	CONT.

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The advanced development of equipment/systems/engineering data and full scale weapons effects simulation will provide protection of ships and their personnel from conventional, chemical, and biological weapon effects, and enable the ship to continue performing assigned missions at an effective level. This program is also concerned with the effects of fire, smoke, and lethal environments created by peacetime accidents and the development of fire protection and damage control capabilities necessary to limit, control, and correct wartime and peacetime casualty situations.

(U) PBD 250 directs, starting FY 1996, that services budgets for nuclear, biological, and chemical (NBC) defense programs be consolidated in OSD accounts. As a result, P.E. 0603514N/S2053 transitions to P.E. 0603884D/S205 for this project and budget activity.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under DEMONSTRATION & VALIDATION because it develops and integrates hardware for experimental tests related to specific ship or aircraft applications.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603514N PROGRAM ELEMENT TITLE: Ship Combat Survivability PROJECT NUMBER: S0384 PROJECT TITLE: Combat Survivability Design

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
S0384 Combat Survivability Design	3,232	2,972	1,502	2,059	2,120	2,106	2,151	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project supports the development of protection concepts, specifications and standards to meet objectives of OPNAVINST 9070.1, "Survivability Policy for Surface Ships of the U.S. Navy", dtd 23 Sep 1988. Specifically, combatants must be able to deal with the degrading effects of damage from anti-ship missiles (ASMs), torpedoes, and mines. Additionally, the lessons learned from the Persian Gulf experience demonstrated the need to: (1) improve the resistance of the hull girder and equipment/systems against underwater explosion (UNDEX) shock and whipping effects, and (2) provide uninterruptible shipboard power to ensure continuous combat capability.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS:

- (U) ($95) Constructed prototype blast hardened doors and prepared drawings.
- (U) ($1,937) Conducted scaled whipping (dynamic) verification tests of underwater explosion (UNDEX) resistant hull girder hardening designs. Initiated preparation of design guidance manual.
- (U) ($475) Initiated development of Advanced Shock Isolation Systems (ASIS) and design methods for protecting state-of-the-art commercial grade equipment from UNDEX shock effects eliminating the need for individual equipment shock hardening. Identified isolation options for protecting equipment within a typical mission critical compartment.
- (U) ($575) Completed advanced development of rapid fault clearing system designed to isolate multiple electrical faults caused by ASM threats. Conducted demonstration/validation test. (Transition to PE 0604516N, S1828 (Combat Readiness & Sustainability)).

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603514N PROJECT NUMBER: S0384
PROGRAM ELEMENT TITLE: Ship Combat Survivability PROJECT TITLE: Combat Survivability Design

1. (U) FY 1995 ACCOMPLISHMENTS (Continued):

- (U) ($150) Completed assessment of small waterplane area twin hull UNDEX whipping and shock tests.

2. (U) FY 1996 PLAN:

- (U) ($788) Complete dynamic verification testing of UNDEX resistant hull girder designs. Finalize design guidance manual.
- (U) ($1,400) Design and begin construction of a prototype ASIS consisting of advanced shock mitigating mounts supporting a "floating raft" platform and a representative suite of mission critical equipment.
- (U) ($772) Initiate development of Integrated Magazine Protection Systems (IMPS) to reduce the vulnerability of a magazine to mass detonation by integrating anti-fratricide shielding to prevent sympathetic detonation, explosion suppression systems to contain any munitions reaction within the magazine boundary, and blast and fragment tolerant magazine boundaries. Define IMPS integration options to support identification of ship/magazine interface requirements.
- (U) ($12) Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15 U.S.C.638.

3. (U) FY 1997 PLAN:

- (U) ($640) Complete construction of the prototype ASIS and conduct full scale UNDEX proof-of-concept tests. Initiate total ship systems integration and producibility studies to define outfitting and structural construction procedures.
- (U) ($862) Conduct full-scale weapon effects testing of IMPS to evaluate alternative explosion suppression systems including a water channel located around each missile warhead. Conduct ship producibility studies.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603514N PROJECT NUMBER: S0384
PROGRAM ELEMENT TITLE: Ship Combat Survivability PROJECT TITLE: Combat Survivability Design

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996 President's Budget:	3,269	3,066	2,486
(U) Adjustments from PRESBUDG:	-37	-94	-984
(U) FY 1997 PRESBUDG Submit:	3,232	2,972	1,502

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1995 decrease due to University Research and SBIR adjustments. FY 1996 decrease due to congressional undistributed general and inflation reductions. FY 1997 decreases due to revised inflation estimates and other minor pricing adjustments (199K) and changes in requirements reflected in the FY 1997 Mine Warfare Plan (785K).

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

C. (U) OTHER PROGRAM FUNDING SUMMARY: Specification changes included in new construction ships (SCN funding). Procurement information not available at this level of detail.

(U) RELATED RDT&E:

(U) PE 0604516N, Project S1828 (Combat Readiness & Sustainability).

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603514N PROJECT NUMBER: S0384
PROGRAM ELEMENT TITLE: Ship Combat Survivability PROJECT TITLE: Combat Survivability Design

D. (U) SCHEDULE PROFILE:

	FY 1995	FY 1996	FY 1997	TO COMPLETE
Program Milestones				
Engineering Milestones	1Q UNDEX Hull Girder Whipping Test Plan (Dynamic) 3Q Rapid Fault Clearing System Prototype 4Q ASIS Shock Mount Isolation Options	4Q UNDEX Hull Girder Design Manual 4Q IMPS Integration Options	4Q ASIS Integration/ Producibility Studies 4Q IMPS Producibility Studies	
T&E Milestones	4Q UNDEX Whipping Model Tests	3Q UNDEX Whipping Model Tests		

000202

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603514N PROJECT NUMBER: S0384
PROGRAM ELEMENT TITLE: Ship Combat Survivability PROJECT TITLE: Combat Survivability Design

D. (U) SCHEDULE PROFILE:

	FY 1995	FY 1996	FY 1997	TO COMPLETE
	4Q Rapid Fault Clearing Test			
			2Q IMPS Suppression Tests	
Contract Milestones	Not applicable	Not applicable	Not applicable	

000203

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603514N PROJECT NUMBER: S1121
PROGRAM ELEMENT TITLE: Ship Combat Survivability PROJECT TITLE: Personnel Protection

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
S1121 Personnel Protection	2,840	2,422	1,894	2,142	2,513	2,509	2,566	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: S1121, Personnel Protection. Provides for design/development/evaluation of shipboard personnel clothing and equipment to protect ship's complement from the effects of hostile actions and peacetime accidents.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS:

- (U) ($170) Conducted S-TRON Emergency Escape Breathing Apparatus (EEBD) Failure Analysis.
- (U) ($90) Completed design review of Judge Advocate General reports and NAVSEA fire investigations to define the design basis for breathing air requirements for firefighting operations.
- (U) ($80) Completed review of breathing air requirements during major shipboard fires.
- (U) ($80) Developed Immediately Dangerous to Life and Health (IDLH) Supplied Air Respirator (SAR) spare parts provisioning data.
- (U) ($250) Completed evaluation of Self Contained Breathing Apparatus (SCBA) cost, wearability, reliability, maintainability, size and duration, composite cylinder safety, stowage and recharging issues.
- (U) ($250) Completed metabolic simulator tests of Fire Fighter's Breathing Apparatus, Litpac II, and FR-60.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603514N PROJECT NUMBER: S1121
PROGRAM ELEMENT TITLE: Ship Combat Survivability PROJECT TITLE: Personnel Protection

1. (U) FY 1995 ACCOMPLISHMENTS (Continued):

- (U) ($120) Completed manned high temperature fire tests to evaluate breathing air temperature of Oxygen Breathing Apparatus (OBA) and alternatives.
- (U) ($220) Completed FFBA post qualification tests, OBA facepiece lens cover tests and manned OBA tests.
- (U) ($80) Completed SCOTT EEBD shelf-life and operational analysis.
- (U) ($120) Completed initial metabolic simulator tests of four candidate replacement EEBDs.
- (U) ($50) Amended MIL-L-24778 (Auto-Inflatable Utility Life Preserver (AIULP) - MKV) specification to include stabilization straps into production design.
- (U) ($50) Identified improved auto-inflator draft technical requirements.
- (U) ($60) Completed specifications and patterns for redesigning MK-1 life preserver with bladders that fit up to X-Large size.
- (U) ($50) Completed design analysis of MK-1 life preserver with integral lifting harness and let prototype fabrication contract.
- (U) ($70) Completed shipboard evaluation of improved 3M Photoluminescent tape aboard USS Enterprise (CVN 65).
- (U) ($20) Initiated evaluation of two prototype distress marker lights for suitability as replacement devices.
- (U) ($60) Initiated evaluation of two prototype abandon ship life preservers with heat sealed seams for suitability as replacement devices.
- (U) ($80) Obtained 200+ chemical pill auto-inflators from three vendors, completed test plan and initiated pool tests to determine candidate replacement for Fleet auto-inflators.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603514N PROJECT NUMBER: S1121
PROGRAM ELEMENT TITLE: Ship Combat Survivability PROJECT TITLE: Personnel Protection

1. (U) FY 1995 ACCOMPLISHMENTS (Continued):

- (U) ($100) Completed Ballistic tests on 15 prototype Naval Battle Helmets (NBHs) and 13 Navy Flak Vest (NFV) panels.
- (U) ($70) Completed impact tests on 4 prototype NBHs.
- (U) ($150) Completed design and initiated procurement of NBH shell and impact liner molds.
- (U) ($50) Completed procurement specification development and initiated procurement of 16,000 improved NBHs and 16000 NFVs.
- (U) ($20) Conducted prototype testing, completed procurement specification development and production contract, took delivery and distributed to the Fleet 8484 improved fire fighting helmets.
- (U) ($70) Evaluated two types of damage control flooding suits for suitability as replacement units.
- (U) ($130) Completed test plan, initial demonstration fire tests and test report for evaluation of fire retardant vs. non-fire retardant clothing fire tests.
- (U) ($180) Completed Fleet tests of improved Cold Weather Jacket, Engineering Coveralls and Flight Deck Jerseys.
- (U) ($170) Completed development of one prototype improved Fire Fighter's Ensemble (FFE) with a removable liner and an improved vapor barrier for use as a replacement FFE.

2. (U) FY 1996 PLAN:

- (U) ($500) Complete SCBA shipboard evaluation aboard U.S.S. Tortuga (LSD 46), development of an OBA replacement process instruction and shipboard stowage plan, and provide MSIII documentation support.
- (U) ($250) Conduct OBA replacement cooling gas system evaluations.
- (U) ($233) Continue to test/evaluate improved Fire Fighter's Clothing.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603514N PROJECT NUMBER: S1121
PROGRAM ELEMENT TITLE: Ship Combat Survivability PROJECT TITLE: Personnel Protection

2. (U) FY 1996 PLAN (Continued):

- (U) ($450) Conduct EEBD TECHEVAL.
- (U) ($300) Conduct Life Preserver Improvement Program investigations.
- (U) ($100) Complete update of IDLH/SAR logistical documentation.
- (U) ($63) Conduct Emergent Safety Equipment investigations.
- (U) ($200) Conduct ballistic evaluations of Phone Talkers Helmet (PTH).
- (U) ($200) Develop Integrated Fire Fighter's Protective Ensemble.
- (U) ($100) Evaluate commercial fall protection equipment for use with firefighters and prepare procurement specification.
- (U) ($26) Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with U.S.C.638

3. (U) FY 1997 PLAN:

- (U) ($200) Complete OBA replacement cooling gas system evaluation.
- (U) ($200) Provide OBA replacement shipboard installation plans and documentation support.
- (U) ($523) Provide procurement specifications for improved Fire Fighter's Clothing.
- (U) ($300) Provide EEBD replacement shipboard installation plans and documentation support.
- (U) ($350) Continue Life Preserver Improvement Program investigations.

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603514N PROJECT NUMBER: S1121
PROGRAM ELEMENT TITLE: Ship Combat Survivability PROJECT TITLE: Personnel Protection

3. (U) FY 1997 PLAN (Continued):

- (U) ($61) Conduct Emergent Safety Equipment investigations.
- (U) ($60) Develop fire retardant Anti-Exposure Suit.
- (U) ($200) Continue development and evaluation of integrated Fire Fighter's Protective Ensemble.

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996 President's Budget:	2,872	2,499	2,322
(U) Adjustments from PRESBUDG:	-32	-77	-428
(U) FY 1997 PRESBUDG Submit:	2,840	2,422	1,894

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 95 reductions due to University Research and SBIR adjustments. FY 96 reductions due to congressional undistributed general and inflation reductions. FY 97 reductions due to revised inflation estimates and other minor pricing adjustments.

(U) Schedule: Not Applicable.

(U) Technical: Not Applicable.

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603514N PROJECT NUMBER: S1121
PROGRAM ELEMENT TITLE: Ship Combat Survivability PROJECT TITLE: Personnel Protection

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

	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
(U) OPN Line 902000									
	11,197	490	21,300	20,300	23,400	13,700	0	CONT.	CONT.

(U) RELATED RDT&E: Not applicable.

000209

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603514N PROGRAM ELEMENT TITLE: Ship Combat Survivability PROJECT NUMBER: S1121 PROJECT TITLE: Personnel Protection

D. (U) SCHEDULE PROFILE:

	FY 1995	FY 1996	FY 1997	FY 1998	TO COMPLETE
Program Milestones		3Q FFBA MSIII			
Engineering Milestones					
T&E Milestones	2Q FFH First Article Testing (FAT)	3Q NBH FAT	3Q NFV FAT	2Q FFBA/3Q LEP/ EEBD FAT	
Contract		2Q NBH Production contracts award	2Q NFV/4Q FFBA Production contracts award	2Q LEP/EEBD Production contracts	

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603514N
PROGRAM ELEMENT TITLE: Ship Combat Survivability

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
S1565 Fire Protection/Damage Control Systems	6,269	5,894	2,353	5,048	5,683	5,666	5,791	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Persian Gulf war lessons-learned have highlighted the significant threat to the ship's mission capability and crew caused by the near immediate spread of fire, smoke, and flooding following an attack, and the need to execute damage control (DC) actions with a more organized and coordinated response. Additionally, the inability to rapidly restore vital hull, mechanical, and electrical (HM&E) systems following damage was also highlighted.

(U) In response to the Persian Gulf lessons-learned, including peacetime lessons-learned, this project supports the development and evaluation of systems which will enable the ship and crew to contain damage to the compartments of origin, and rapidly restore vital HM&E systems providing for recovery of mission capability. System development areas include: 1) computerized information management (IM) systems which collect, analyze, and display, in real-time, key information on the damage status of the ship and HM&E systems, and provide recommended DC actions for containing damage and restoring vital HM&E services, 2) active and passive fire protection systems, and 3) advanced DC training systems which account for all aspects of combat induced damage, decision making in high stress environments, and recovery/restoration.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS:

- (U) ($625) Conducted full-scale fire hazard tests of selected shipboard materials, including cable arrays and mattresses.
- (U) ($525) Conducted water mist shipboard qualification tests and prepared preliminary specification for fixed fine water mist fire extinguishing system.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603514N PROGRAM ELEMENT TITLE: Ship Combat Survivability PROJECT NUMBER: S1565 PROJECT TITLE: Fire Protection/Damage Control Systems

1. (U) FY 1995 ACCOMPLISHMENTS (Continued):

- (U) ($475) Continued incorporation of time-dependent architecture into the Ship Vulnerability Model (SVM) to support assessing ship design options. Initiated dynamic electrical model development which predicts the response of the electrical system to faults induced by fragmenting threats.
- (U) ($300) Initiated shipboard T&E of preliminary Real-Time Stability Status (RTSS) software module to demonstrate automatic stability assessments based on variable tank level indicator readings.
- (U) ($300) Continued development of structural assessment software module for the Damage Control System (DCS) which defines hull girder integrity after attack and recommended dewatering and structural reinforcement locations.
- (U) ($300) Completed development of fleet training software for selected ships which identifies inactivated equipment and damaged or flooded compartments, as a function of threat.
- (U) ($700) Conducted full-scale DC tests aboard ex-USS SHADWELL to evaluate the effectiveness of a single repair party using the latest equipment/systems in responding to realistic casualties focusing on improving equipment use procedures, developing doctrine, and identifying system design shortfalls.
- (U) ($350) Initiated development of interactive computer-based DC training systems which will accurately simulate combat scenarios and support, (1) training the shipboard command and control personnel to effectively use advanced DC systems and make decisions under high stress, and (2) interdepartmental coordination for restoration of HM&E services vital to combat systems. Initiated development of interactive system for the Repair Locker Leader.
- (U) ($752) Completed development of DC system architecture requirements in a missile attack scenario.
- (U) ($1,942) Conducted various tasks including: performed comparative full scale fire test of fire resistant uniforms, conducted shipboard evaluation of NDI self contained breathing apparatus, evaluated firefighting training aids, identified deficiencies in equipment shock hardening, prepared Cold Weather Naval Warfare Publication (NWP), and updated NWP 79, Volume 2, "Practical Damage Control" specification.

000212

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4
PROGRAM ELEMENT: 0603514N
PROGRAM ELEMENT TITLE: Ship Combat Survivability
PROJECT NUMBER: S1565
PROJECT TITLE: Fire Protection/Damage Control Systems

2. (U) FY 1996 PLAN:

- (U) ($250) Complete full-scale fire tests of selected shipboard compartments and prepare material performance specification.
- (U) ($530) Prepare final specification for fixed fine water mist fire extinguishing system.
- (U) ($650) Complete development of the SVM dynamic electrical model.
- (U) ($500) Complete ship-based evaluation of preliminary RTSS software module.
- (U) ($500) Continue structural assessment software module development for DCS.
- (U) ($200) Update Fleet assessment software which identifies inactivated equipment as a function of threat to allow for more rapid and efficient program execution.
- (U) ($917) Complete full-scale single repair party DC tests aboard the ex-USS SHADWELL; conduct evaluation of the ability of multiple repair parties to effectively control a complex scenario involving fire and smoke.
- (U) ($660) Complete development of interactive training system for the Repair Locker Leader.
- (U) ($600) Provide technical and logistic support assessments for existing damage control/firefighting equipment and systems.
- (U) ($150) Develop a survivable damage control sensor architecture design which identifies the primary damage zone and tracks fire and smoke progression in real time. Initiate integration into DCS to display sensor data.
- (U) ($320) Initiate development of a firemain reconfiguration management module for DCS which supports rapid restoration following a rupture. Evaluate system options including, isolating existing firemains into more survivable configurations, sensors which identify the location of a rupture, and software which provides reconfiguration options.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603514N PROGRAM ELEMENT TITLE: Ship Combat Survivability PROJECT NUMBER: S1565 PROJECT TITLE: Fire Protection/Damage Control Systems

2. (U) FY 1996 PLAN (Continued):

- (U) ($300) Initiate development of an integrated HM&E/Combat System (CS) status assessment and reconfiguration management software module for DCS that provides mission restoration options based on combat system equipment status and HM&E vital service conditions. Develop detailed HM&E/CS system requirements.
- (U) ($250) Initiate assessment of current magazine sprinkler systems to provide sufficient cooling to prevent mass deflagration under combat threat conditions. Specifically, investigate external fire threats raising the magazine air temperature above a critical level, and penetrating threats which initiate propellant burning.
- (U) ($67) Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15 U.S.C.638.

3. (U) FY 1997 PLAN:

- (U) ($400) Conduct shipboard T&E of final RTSS software module integrated with flooding sensors and tank level indicators.
- (U) ($350) Conduct fleet evaluation of the DCS structural assessment software module.
- (U) ($153) Complete integration of sensor data into DCS. Conduct full scale demonstration aboard ex-USS SHADWELL.
- (U) ($450) Continue development of a firemain reconfiguration management module for DCS. Initiate land-based T&E of alternative systems.
- (U) ($700) Continue development of an integrated HM&E/CS status assessment and reconfiguration management software module for DCS. Develop software specifications.
- (U) ($300) Complete assessment of current magazine sprinkler systems. Develop performance-based specification.

000214

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603514N PROGRAM ELEMENT TITLE: Ship Combat Survivability PROJECT NUMBER: S1565 PROJECT TITLE: Fire Protection/Damage Control Systems

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996 President's Budget:	6,340	6,084	5,219
(U) Adjustments from PRESBUDG:	-71	-190	-2,866
(U) FY 1997 PRESBUDG Submit:	6,269	5,894	2,353

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1995 decrease due to University Research and SBIR adjustments. FY 1996 decreases due to congressional undistributed general and inflation reductions. FY 1997 decreases due to revised inflation estimates and other minor pricing adjustments (866K) and changes in requirements reflected in the FY 1997 Mine Warfare Plan (2,000K).

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

C. (U) OTHER PROGRAM FUNDING SUMMARY: Specification changes included in new construction ships (SCN funding). Procurement information not available at this level of detail.

(U) RELATED RDT&E:
(U) PE 0604516N, Project S2054 (Integrated Fire Protection/Damage Control).

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603514N
PROGRAM ELEMENT TITLE: Ship Combat Survivability

PROJECT NUMBER: S1565
PROJECT TITLE: Fire Protection/Damage Control Systems

D. (U) SCHEDULE PROFILE:

	FY 1995	FY 1996	FY 1997	TO COMPLETE
Program Milestones				
Engineering Milestones	4Q DC Systems Architecture Requirements			
		4Q Survivable Fire/ Smoke Sensor Design		
	4Q Water Mist Specification			
		4Q Time-Dependent SVM Dynamic Electrical Model		
	4Q RTSS Test Plan Software Integration Requirements	4Q RTSS Software Module (Preliminary)	4Q RTSS Software Module (Final)	

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603514N
PROGRAM ELEMENT TITLE: Ship Combat Survivability
PROJECT NUMBER: S1565
PROJECT TITLE: Fire Protection/Damage Control systems

D. (U) SCHEDULE PROFILE: (Cont.)

	FY 1995	FY 1996	FY 1997	TO COMPLETE
Engineering Milestones (Cont.)	1Q DCS Structural Assessment Software Options	4Q DCS Structural Assessment Software Module		Continued
	4Q Interactive DC Training System Requirements	4Q Interactive DC Training System Module for Repair Locker Leader		
		4Q Magazine Combat Threat Assessment	4Q Magazine Sprinkler System Vulnerability Assessment and Specification	Continued
	4Q Shipboard Compartment Material Fuel Load Assessment	4Q Material Performance Specification		
		4Q DCS Firemain Reconfiguration Options	2Q DCS Test Plan	Continued
		4Q HM&E/Combat Systems Reconfiguration System Requirements	4Q Software Requirements	Continued

000217

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603514N
PROGRAM ELEMENT TITLE: Ship Combat Survivability
PROJECT NUMBER: S1565
PROJECT TITLE: Fire Protection/Damage Control Systems

D. (U) SCHEDULE PROFILE: (Cont.)

	FY 1995	FY 1996	FY 1997	TO COMPLETE
T&E Milestones	3Q Shipboard Materials Fire Hazard Tests 3Q Water Mist Qualification Tests	3Q RTSS Integration Demonstration 2Q Single Repair Party Full Scale DC Communication and Equipment Procedure Evaluations	4Q RTSS Ship-based Evaluations 4Q Fire/Smoke Sensor Demonstration	Continued
Contract Milestones	Not Applicable	Not Applicable	Not Applicable	

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FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603528N
PROGRAM ELEMENT TITLE: Non-Acoustic ASW

(U) COSTS: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
H0967 NON ACOUSTIC ASW	0*	9,689	0	0	0	0	0	0	9,689

*** FY 1995 funding executed under OSD P.E. 0603714D.**

A. (U) MISSION DESCRIPTION AND BUDGET JUSTIFICATION: The purpose of this program is to ensure that Non-Acoustic ASW (NAASW) concepts are properly evaluated and exploited. The current scaled-down program focuses only on one technology which can be developed in the near term and promises to be effective against very quiet submerged diesel submarine independent of target speed, and other submerged objects. (The technology is a helicopter mounted optical laser hard body detection system (Project ATD-111)).

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under DEMONSTRATION & VALIDATION because it develops and integrates hardware for experimental test related to specific ship or aircraft applications.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603528N PROJECT NUMBER: H0967
PROGRAM ELEMENT TITLE: Non-Acoustic ASW PROJECT TITLE Non-Acoustic ASW

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS: (Funded under OSD P.E. 0603714D. Actual authorization was $4,756 thousand)

- (U) (2,500) Completed System upgrades and system integration.
- (U) (400) Completed shakedown tests.
- (U) (1,161) Completed range tests at Atlantic Undersea Test and Evaluation Center.
- (U) (695) Initiated Modeling and data analysis.

2. (U) FY 1996 PLAN:

- (U) (4,716) Test system upgrades.
- (U) (370) Correct system defects identified during field tests.
- (U) (2,268) Bring test systems to common configuration.
- (U) (150) Evaluate carriage on alternate airborne platforms..
- (U) (2,185) Comparative evaluation with Secretary of Defense sponsored April Showers Project.

3. (U) FY 1997 PLAN: Not Applicable. ATD-111 Project ends with FY 96 funding.

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996/1997 President's Budget:	0	0	0
(U) Adjustments from PRESBUDG:	0	+9,689	0
(U) FY 1997 President's Budget Submit:	0	+9,689	0

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603528N PROJECT NUMBER: H0967
PROGRAM ELEMENT TITLE: Non-Acoustic ASW PROJECT TITLE Non-Acoustic ASW

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY 1996 funding increase is the result of a Congressional directed plus-up for the ATD-111 NAASW program.

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

C. OTHER PROGRAM FUNDING SUMMARY: Not applicable.

(U) RELATED RDT&E:

(U) PE 0603714D, OSD NAASW Program
(U) PE 0101224N, SSBN Security Tech Program

D. SCHEDULE PROFILE: Not applicable.

000222

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

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603528N PROJECT NUMBER: H0967
PROGRAM ELEMENT TITLE: Non-Acoustic ASW PROJECT TITLE: Non-Acoustic ASW

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

Project Cost Categories	FY 1995	FY 1996	FY 1997
a. Research Support Equip.	0	4,099	0
b. Software Development	0	150	0
c. Systems Engineering	0	789	0
d. Test and Evaluation	0	4,616	0
f. Travel	0	35	0
Total	0	9,689	0

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603528N PROJECT NUMBER: H0967
PROGRAM ELEMENT TITLE: Non-Acoustic ASW PROJECT TITLE: Non-Acoustic ASW

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	To Complete	Total Program
Product Development									
Contracts $1M or more									
JHU/APL	C/CPFF	05/96	1,600	1,600	0	1,600	0	0	1,600
FIBERTEK	SS/CPFF	07/96	1,400	1,400	0	1,400	0	0	1,400
MISC, all other contracts less than $1M(Aggregate Total)					0	1,301	0	0	1,301
In-house Support $1M or more									
NRaD	WX	05/96	1,861	1,861	0	1,861	0	0	1,861
In-house Support less than $1M (Aggregate Total)					0	242	0	0	242
Support and Management			359	359	0	359	0	0	359
MISC, all other contracts $1M or less(Aggregate Total)					0	0	0	0	0
Test and Evaluation									
NAWCAD(PAX)	WX	05/96	1,113	1,113	0	1,113	0	0	1,113
NSWC (CSC)	WX	05/96	562	562	0	562	0	0	562
L. SANDERS	SS/CPFF	05/96	601	601	0	601	0	0	601
Arete Assoc.	SS/CPFF	05/96	650	650	0	650	0	0	650

GOVERNMENT FURNISHED PROPERTY - Not Applicable

*** Funded under OSD P.E. 0603714D**

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603528N PROJECT NUMBER: H0967
PROGRAM ELEMENT TITLE: Non-Acoustic ASW

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

PERFORMING ORGANIZATIONS Contractor/Contract GovernmentMethod/ PerformingFund Type Activity Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	FY 1995* & Prior	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Subtotal Product Development				N/A	6,404	0	0	6,404
Subtotal Support and Management				N/A	359	0	0	359
Subtotal Test and Evaluation				N/A	2,926	0	0	2,926
Total Project				N/A	9,689	0	0	9,689

*** Funded under OSD P.E. 0603714D**

Audrey Karen Snyder

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: March 1996

UDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603542N
PROGRAM ELEMENT TITLE: Radiological Control

U) COST: (Dollars in Thousands)

ROJECT UMBER & ITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
1825 Radiological Controls	88	0	0	0	0	0	0	0	88
1830 RADIAC Development	3,354	3,104	2,886	2,971	3,610	3,606	3,687	CONT.	CONT.
OTAL	3,442	3,104	2,886	2,971	3,610	3,606	3,687	CONT.	CONT.

U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

U) Project S1825 supports two major Navy-wide radiation protection efforts. The first is development of a computer modeling rogram for estimating potential radiation exposures in and around nuclear weapons and other radiation sources, suitable for ersonal computers. The program Mathematical Radiation Environment Model for Ships (MREMS) utilizes all known radiation arameters particular to a weapons system as well as composition and arrangement of intervening structures. Although nitially intended for use as a shipboard radiation exposure prediction system, MREMS has a significantly more important role oday as a valid means for estimating potential radiation exposures received from weapons systems, and other sources of onizing radiation, in radiation exposure claims. MREMS has applicability to other sources of ionizing radiation enter the intrinsic radiation data and composition of the surrounds) as well as for use by other military services. This roject also concerns refinement of neutron measurement from weapons and other industrial sources involving scientific aboratory/field testing. The importance of this effort is that the relative risk from neutron exposure is still a question f concern and uncertainty within the scientific community.

000226

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: March 1996

UDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603542N
PROGRAM ELEMENT TITLE: Radiological Control

U) Project S1830 coordinates all Navy efforts for the development of nuclear radiation detection devices in direct support of he Navy Nuclear Propulsion Program and other users by providing accurate, reliable Health Physics instrumentation at the owest possible life-cycle cost. Reliable radiation monitoring instruments are needed to ensure the radiological safety of avy personnel. This includes hand-held RADIAC meters, personnel dose measurement devices, and area monitors used to measure adiation fields. The Laser Heated Thermoluminescent Dosimetry (LHTLD) System will be able to meet new NRC regulations and ill provide sensitive measurements down to the levels required to meet all new and imminent health and safety requirements. he Multifunction RADIAC will cut calibration costs by up to 75% and reduce the requirements for spare parts by 85% by eplacing over 60 different models of obsolete equipment. This project has a 5 to 1 payback ratio. New requirements for the easurement of lower neutron levels necessitate the development of modernized instrumentation. The program is critical to oint-service radiation safety initiatives within DOD and has been coordinated with Army, Air Force, and Defense Nuclear gency personnel to achieve the maximum cross-service applicability.

U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under DEMONSTRATION & VALIDATION because it develops and ntegrates hardware for experimental test related to specific ship or aircraft applications.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT:0603542N
PROGRAM ELEMENT TITLE: Radiological Control

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
S1830 RADIAC Development	3,354	3,104	2,886	2,971	3,610	3,606	3,687	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: Project S1830 coordinates all Navy efforts for the development of nuclear radiation detection devices in direct support of the Navy Nuclear Propulsion Program and other users by providing accurate, reliable Health Physics instrumentation at the lowest possible life-cycle cost. Reliable radiation monitoring instruments are needed to ensure the radiological safety of Navy personnel. All OR's issued 25 Aug 1987.

Multifunction RADIAC (MFR), OR #176-04-86
Laser Heated Thermoluminescent Dosimetry (LHTLD) System, OR #180-04-87
Neutron Dosimetry System, OR #179-04-87
Automated RADIAC Calibration and Diagnostics System, OR #175-04-86
Underwater RADIAC System, OR #178-04-88
Wide Range Survey Meter, OR #177-04-87
Tritium Monitors, OR #182-04-89
EOD Personal Dosimeter, OR #181-04-87 (Updated 09 MAR 95 as 392-04-95)

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

UDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603542N PROJECT NUMBER: S1830
PROGRAM ELEMENT TITLE: Radiological Control PROJECT TITLE: RADIAC Development

U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS:

- (U) ($2,084) Continued Engineering and Manufacturing Development (EMD) Phase III for LHTLD System. Began development of Copper-doped Lithium dosimeter.
- (U) ($967) Began development of interfaces for Plastic Scintillation Probe, Alpha Probe, Beta Probe, and Universal (alpha, beta, gamma) probe, and small gamma probe for MFR System.
- (U) ($253) Began development of Casualty Dosimeter; began evaluation of commercial Gamma Camera. Tested and evaluated DT-60 and IM-107 dosimeters. Completed EOD Dosimeter through Non-Development Item (NDI) procurement.
- (U) ($50) Resumed development of Tritium Monitor.

2. (U) FY 1996 PLAN:

- (U) ($2,306) Complete EMD Phase III for LHTLD System. Continue development of Copper-doped Lithium dosimeter. Begin development of proton recoil neutron dosimeter and beta dosimeter.
- (U) ($647) Continue development of Plastic Scintillation, beta, and universal probes. Begin development of flexible gamma probe, remote detectors and Large Scale Integrated circuit (LSI) boards. Complete alpha and small gamma probe.
- (U) ($85) Continue development of Casualty Dosimeter.
- (U) ($50) Continue development of Tritium Monitor.
- (U) ($16) Portion of extramural program reserved for Small Business Innovative Research assessment in accordance with 15 U.S.C.638.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603542N PROGRAM ELEMENT TITLE: Radiological Control PROJECT NUMBER: S1830 PROJECT TITLE: RADIAC Development

3. (U) FY 1997 PLAN:

- (U) ($1,398) Begin enhancements to LHTLD System. Continue development of LHTLD Dosimeters.
- (U) ($1,008) Continue development of MFR universal probe, remote detectors, and LSI boards. Complete plastic scintillation, flexible, and beta probes. Begin development of extendable probe.
- (U) ($60) Continue development of Casualty Dosimeter.
- (U) ($420) Continue development of Tritium Monitor and Underwater RADIAC.

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996 President's Budget:	3,354	3,202	3,060
(U) Adjustments from PRESBUDG:	0	-98	-174
(U) FY 1997 PRESBUDG Submit:	3,354	3,104	2,886

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1996: Congressional undistributed reductions. FY 1997: DBOF, inflation reductions.

(U) Schedule: LHTLD delayed one year and MFR delayed six months to incorporate changes from field evaluation.

(U) Technical: Not applicable.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

UDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603542N PROJECT NUMBER: S1830
PROGRAM ELEMENT TITLE: Radiological Control PROJECT TITLE: RADIAC Development

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

	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
(U) OPN Line 292000 (The following is a subset of Line 292000.)									
Cost Code									
M2010	1,638	1,500	1,165	1,500	1,500	1,500	1,500		
M2012	525	500	500	500	500	500	500		
M2014	342	350	290	350	350	175	175		
M2016	1,368	375	335	0	0	0	0		
M2020	0	200	200	600	600	600	600		
M2022	0	400	500	900	830	900	900		
M2030	240	0	0	0	0	250	0		
Total	4,113	3,325	2,990	3,850	3,780	3,925	3,675	30,252	55,910

(U) RELATED RDT&E: Work on the Underwater RADIAC is being funded ($500K for FY96) separately by the Ordnance Environmental Support Office.

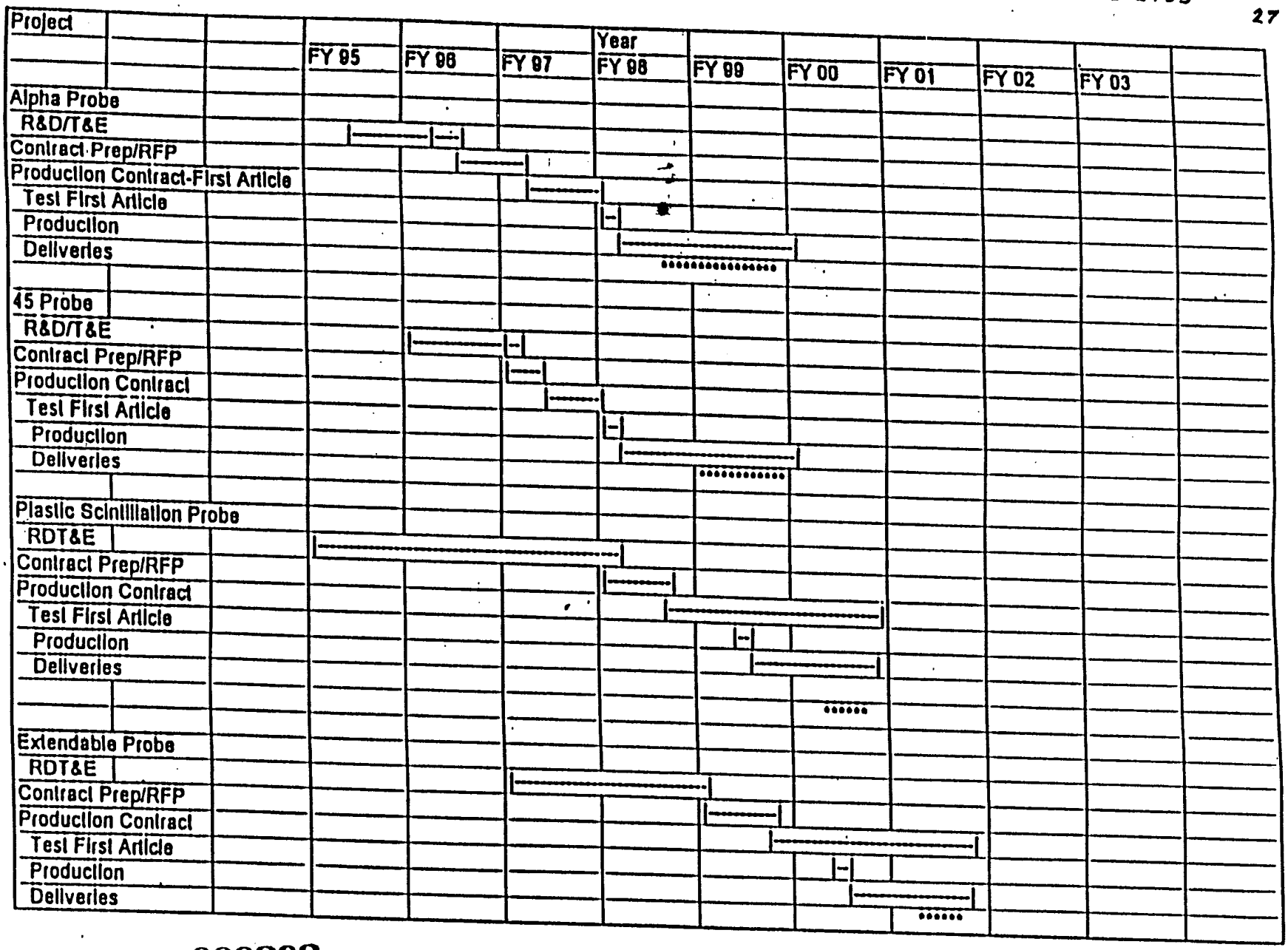
(U) SCHEDULE PROFILE: See attached.

— R&D PLAN —

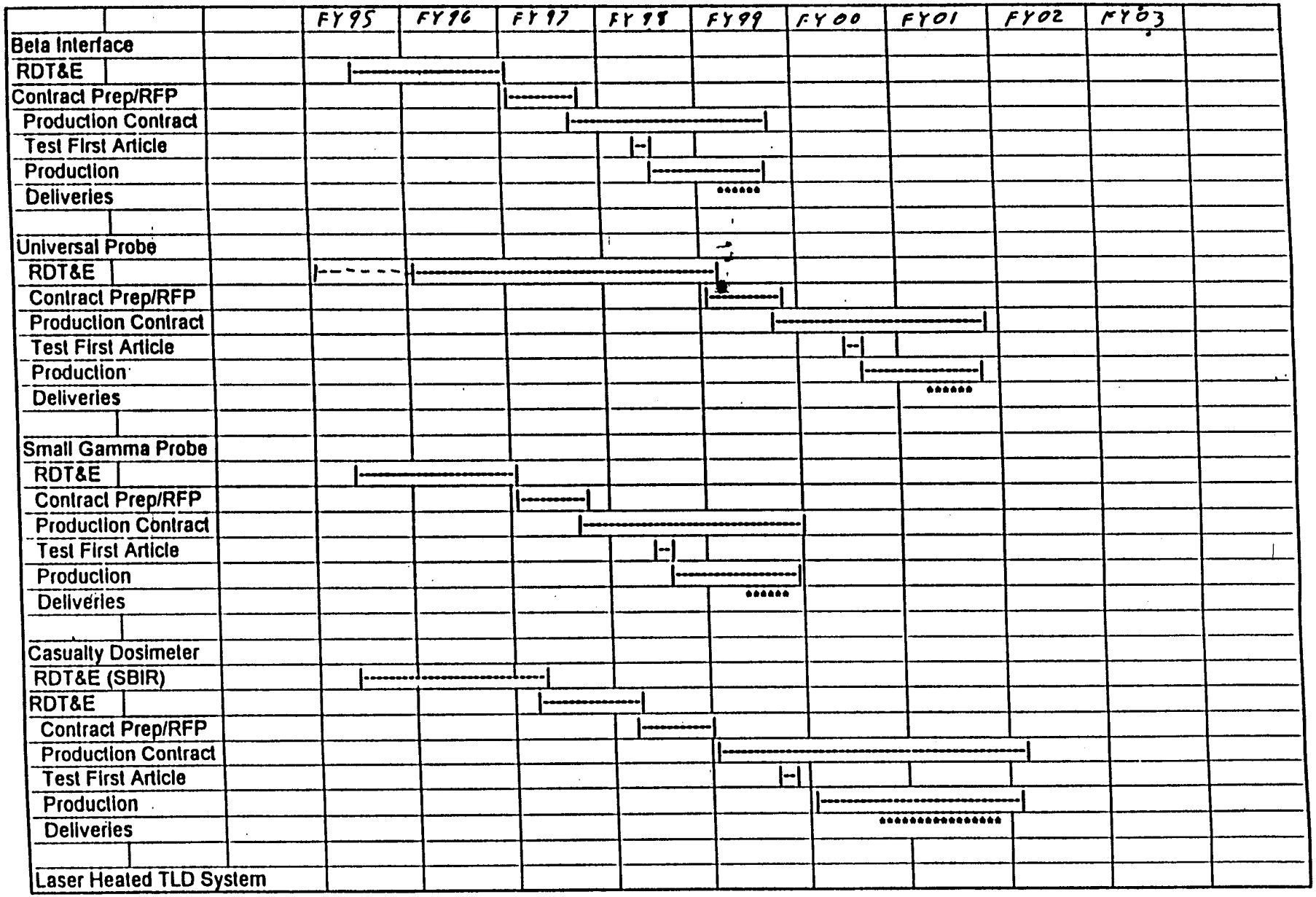
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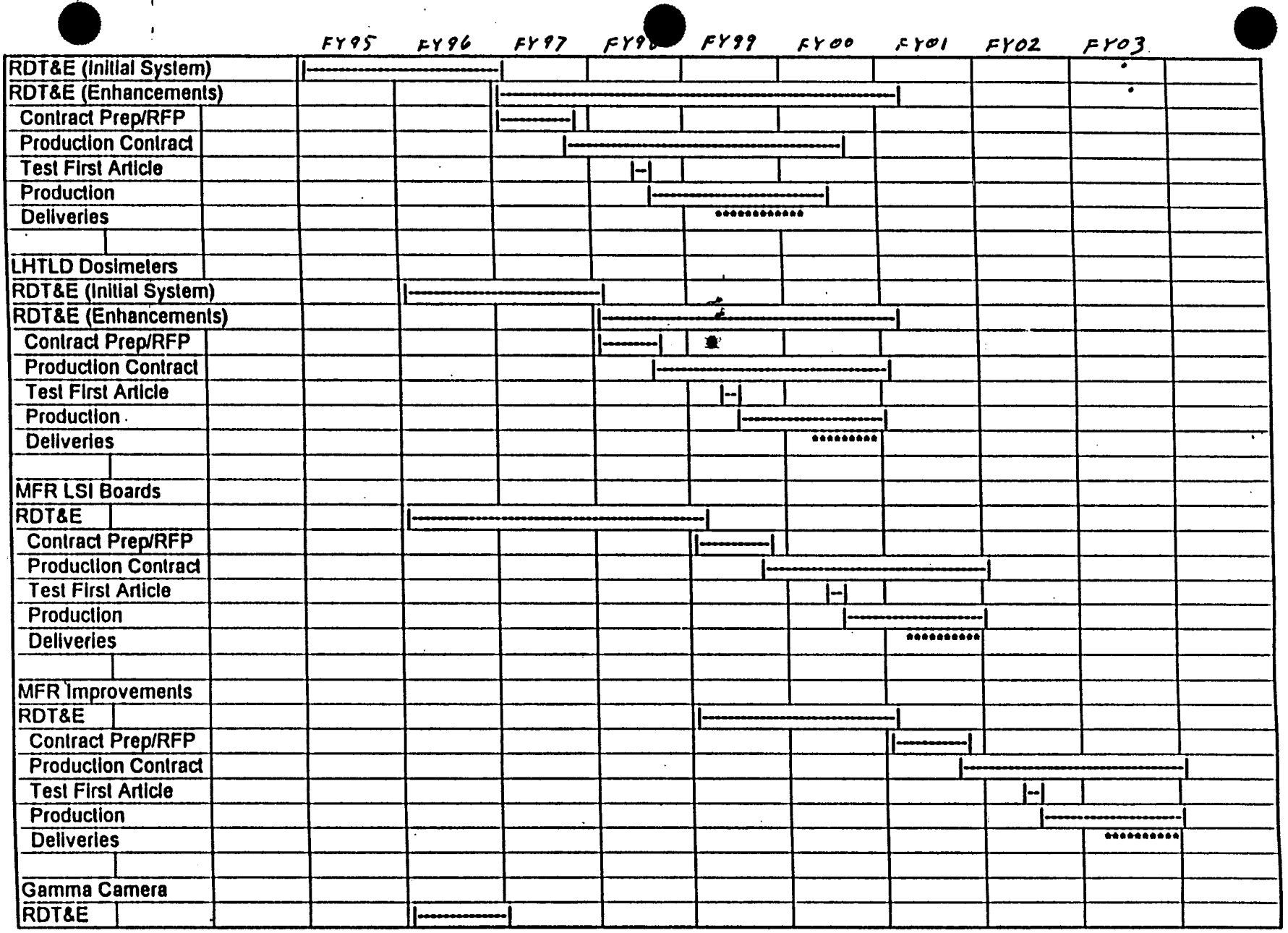
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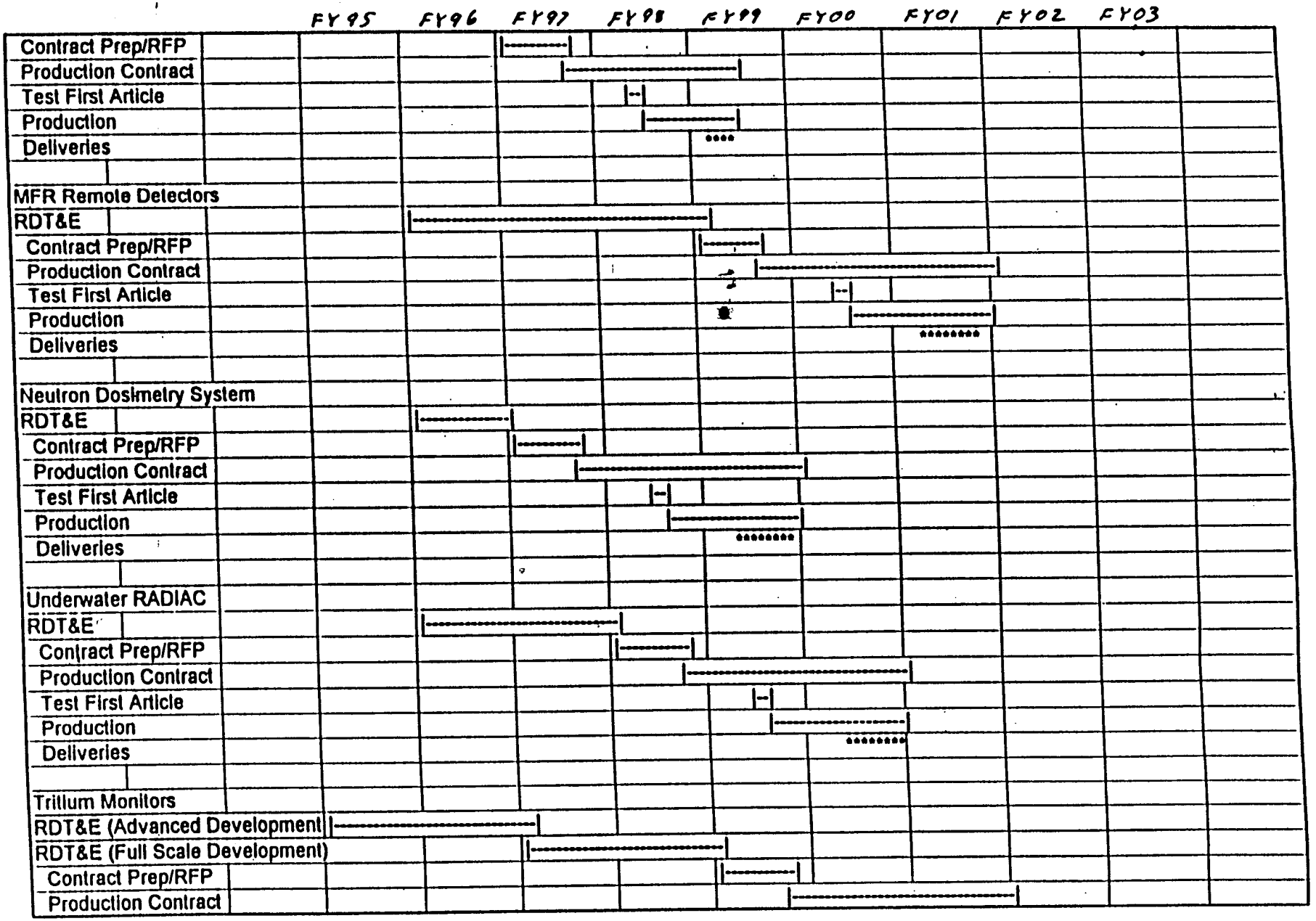
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FY95
FY96
FY97
FY98
FY99
FY00
FY01
FY02
FY03
Beta Interface
RDT&E
Contract Prep/RFP
Production Contract
Test First Article
Production
Deliveries
Universal Probe
RDT&E
Contract Prep/RFP
Production Contract
Test First Article
Production
Deliveries
Small Gamma Probe
RDT&E
Contract Prep/RFP
Production Contract
Test First Article
Production
Deliveries
Casualty Dosimeter
RDT&E (SBIR)
RDT&E
Contract Prep/RFP
Production Contract
Test First Article
Production
Deliveries
Laser Heated TLD System


FY95
FY96
FY97
FY98
FY99
FY00
FY01
FY02
FY03
RDT&E (Initial System)
RDT&E (Enhancements)
Contract Prep/RFP
Production Contract
Test First Article
Production
Deliveries
LHTLD Dosimeters
RDT&E (Initial System)
RDT&E (Enhancements)
Contract Prep/RFP
Production Contract
Test First Article
Production
Deliveries
MFR LSI Boards
RDT&E
Contract Prep/RFP
Production Contract
Test First Article
Production
Deliveries
MFR Improvements
RDT&E
Contract Prep/RFP
Production Contract
Test First Article
Production
Deliveries
Gamma Camera
RDT&E


FY95
FY96
FY97
FY98
FY99
FY00
FY01
FY02
FY03
Contract Prep/RFP
Production Contract
Test First Article
Production
Deliveries
MFR Remote Detectors
RDT&E
Contract Prep/RFP
Production Contract
Test First Article
Production
Deliveries
Neutron Dosimetry System
RDT&E
Contract Prep/RFP
Production Contract
Test First Article
Production
Deliveries
Underwater RADIAC
RDT&E
Contract Prep/RFP
Production Contract
Test First Article
Production
Deliveries
Tritium Monitors
RDT&E (Advanced Development)
RDT&E (Full Scale Development)
Contract Prep/RFP
Production Contract

		FY95	FY96	FY97	FY98	FY99	FY00	FY01	FY02	FY03	
Test First Article											
Production											
Deliveries											

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603553N
PROGRAM ELEMENT TITLE: Surface Anti-Submarine Warfare

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
S0229 Surface Ship Silencing	0	785	0	0	0	0	0	CONT.	66,179
V1704 ASW Advanced Development	6,469	5,656	3,964	6,016	7,443	9,382	9,273	CONT.	CONT.
TOTAL	6,469	6,441	3,964	6,016	7,443	9,382	9,273	CONT.	CONT.

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This program develops surface anti-submarine warfare (ASW) combat system and acoustic silencing technology. The ASW Advanced Development Project provides the advanced development demonstration and validation of technology for potential surface sonar and combat system application. Efforts focus on resolution of technical issues associated with providing capability against the year 2000 and beyond threat with emphasis on shallow water/littoral area ASW. The surface ship acoustic quieting develops surface countermine acoustic silencing technology. In light of the sea mine threat, the surface ship acoustic quieting provides for the development and at-sea demonstration of quieting techniques to reduce surface ship active and passive sonar self-noise, ship radiated noise, and shipboard machine-generated airborne noise. Subprojects are directed toward increasing own ship survivability against a variety of acoustic threats, including acoustic quieting as a mine countermeasure and improving sensor performance by reducing the interference impact on our own force's sensors.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under DEMONSTRATION & VALIDATION because it develops and integrates hardware for experimental test related to specific ship or aircraft applications.

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603553N PROJECT NUMBER: S0229
PROGRAM ELEMENT TITLE: Surface Anti-Submarine Warfare PROJECT TITLE: Surface Ship Silencing

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
S0229 Surface Ship Silencing	0	785	0	0	0	0	0	CONT.	66,179

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: It is critical for improved warfighting capability that ship acoustic signatures be reduced to avoid ship damage and improve sonar performance for mine hunting. Control of acoustic signatures is vital to maintaining warfighting capability for surface mine countermeasure ships since it is directly tied to ship self-defense and survivability in littoral operation.

(U) The U.S. Navy is already lagging both foreign military and foreign commercial knowledge base in transitioning technologies which reduce both cost and surface ship underwater acoustic signatures. Tasks in this project will be highly leveraged against the substantial investments in submarine acoustic silencing and will apply resources to adapt the technologies to surface ships. This is the only surface ship acoustic silencing R&D project beyond exploratory development and provides critical technology for new design and backfit applications. The development of products for quiet propeller enhancements, sonar/acoustic system tactical aids, and machine-generated noise control that support emerging fleet needs will be developed and demonstrated under this project.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS: Not Applicable.

2. (U) FY 1996 PLAN:

- (U) ($780) Diagnose/evaluate emerging fleet problems of acoustic vulnerability of mine countermeasure vehicles. Define research and development (R&D) that will fix the problems and will develop affordable solutions for machinery, propeller, and sonar self-noise problems.
- (U) ($5) Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15 U.S.C.638.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603553N PROJECT NUMBER: S0229
PROGRAM ELEMENT TITLE: Surface Anti-Submarine Warfare PROJECT TITLE: Surface Ship Silencing

3. (U) FY 1997 PLAN:

- (U) Not Applicable.

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996 President's Budget:	0	809	1401
(U) Adjustments from PRESBUDG:	0	-24	-1401
(U) FY 1997 PRESBUDG Submit:	0	785	0

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY1996 decreased due to Congressional undistributed general and inflation reductions. FY1997 decreased due to awaiting results of FY 1996 to further define required scope of work.

(U) Schedule: Results of FY 1996 will provide definition to future year schedule.

(U) Technical: Technical resources will identify the vulnerability to mines, diagnose problems, and define the development required for solution.

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

(U) RELATED RDT&E:

- (U) PE 0602121N (Surface Ship & Submarine HM&E Technology). The acoustics tasks of the Underwater Signature Reduction project conducts exploratory development of technology concepts transitioned to Project S0229 for advanced development.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603553N PROJECT NUMBER: S0229
PROGRAM ELEMENT TITLE: Surface Anti-Submarine Warfare PROJECT TITLE: Surface Ship Silencing

D. (U) SCHEDULE PROFILE:

	FY 1995	FY 1996	FY 1997	TO COMPLETE
Program Milestones		POM 98 Definition		
Engineering Milestones				Prototype Installations
T&E Milestones				Prototype Demonstrations

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603553N PROJECT NUMBER: V1704
PROGRAM ELEMENT TITLE: Surface Anti-Submarine Warfare PROJECT TITLE: ASW Advanced Development

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
V1704 ASW Advanced Development	6,469	5,656	3,964	6,016	7,443	9,382	9,273	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project provides the advanced development demonstration and validation of technology for potential surface sonar and combat system applications. Efforts focus on resolution of technical issues associated with providing capability against the year 2000 and beyond submarine threat with emphasis on shallow water/littoral area ASW. Key technology areas being investigated include active sonar transmissions, signal and information processing, active sonar classification, towed arrays and transducer technology, multi-static sonar, and multi-sensor data fusion. The major near-term effort is development of a mid-frequency towed array test bed (TARS) which will function as a deep receiver adjunct for the SQS-53 transmitter, thereby providing significantly enhanced submarine detection performance against deep submarine targets.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS:

- (U) ($6,469) Continued development of mid-frequency receive array test bed (TARS) including procurement of telemetry subsystem, competitive selection of a towed array contractor, and design of a shallow water towing subsystem. Consolidated surface ship combat control architecture and functionality with submarine advanced development efforts in preparation for joint at sea evaluation. Performed warfare payoff, performance modeling, and operational evaluations.

2. (U) FY 1996 PLAN:

- (U) ($5,578) Continue TARS towed array development, including validation of the telemetry design, and tow cable and handling system modifications. Conduct the TARS towed array critical design review (CDR). Migrate contact management activities to joint tactical control architecture and conduct laboratory performance evaluation. Perform warfare payoff, performance modeling, and operational evaluations.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603553N PROJECT NUMBER: V1704
PROGRAM ELEMENT TITLE: Surface Anti-Submarine Warfare PROJECT TITLE: ASW Advanced Development

- (U) ($78) Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15 U.S.C.638.

3. (U) FY 1997 PLAN:

- (U) ($3,964) Complete development of mid-frequency receive array test bed components (array, towing system, receiver) and begin TARS integration. Conduct at-sea demonstration of joint tactical control development on surface combatant. Perform warfare payoff, performance modeling, and operational evaluations.

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996 President's Budget:	6,572	5,846	4,571
(U) Adjustments from PRESBUDG:	-103	-190	-607
(U) FY 1997 PRESBUDG Submit:	6,469	5,656	3,964

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: Funding has been decreased by 103K in FY1995 due to general reductions. Funding in FY1996 reduced by 167K due to Congressional undistributed general and inflation reductions. Funding in FY1997 reduced by 343K due to poor expenditures and 264K for revised inflation estimates and other minor pricing adjustments.

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

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

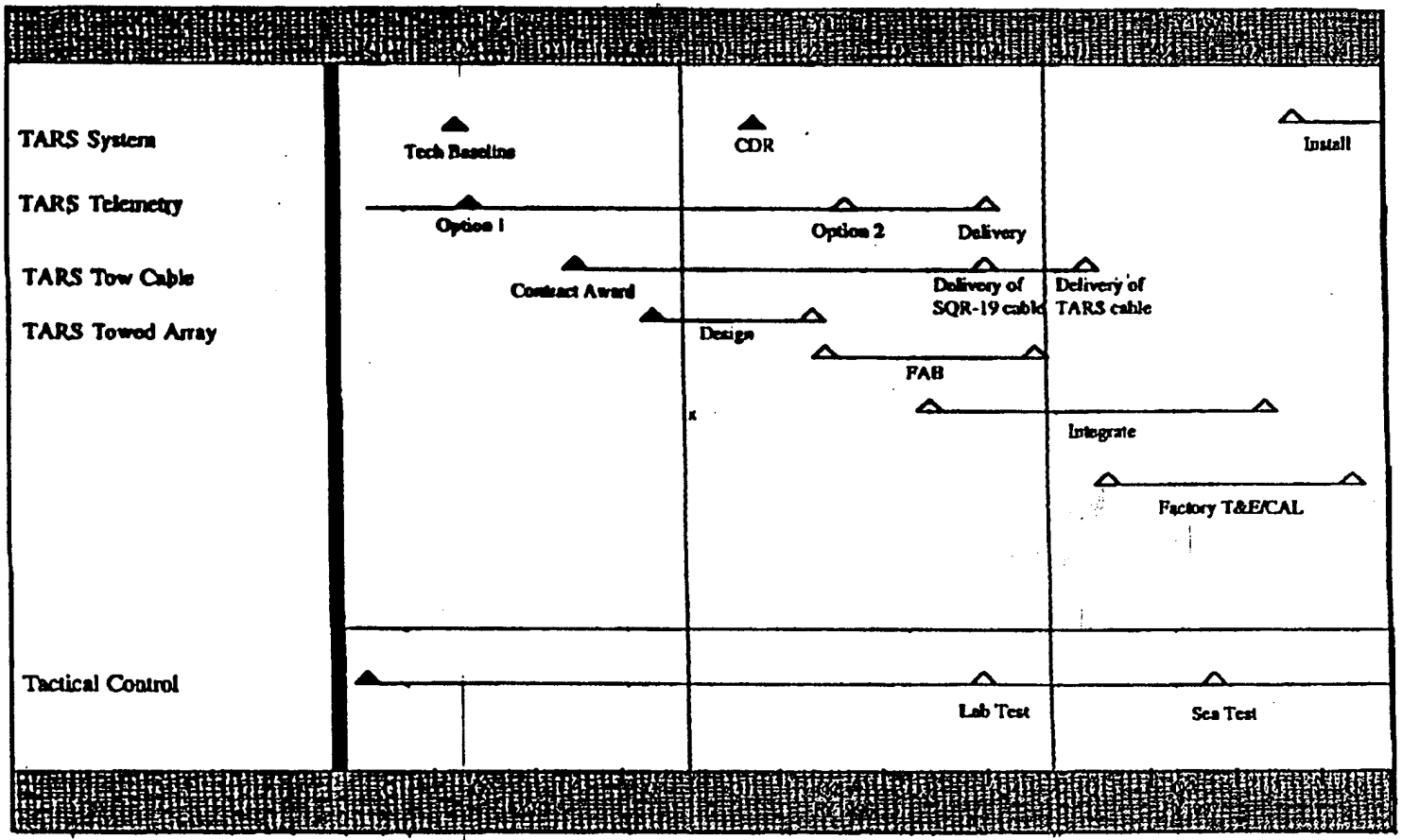
(U) RELATED RDT&E

(U) PE 0602121N (Surface Ship & Submarine HM&E Technology)
(U) PE 0603561N (Advanced Submarine System Development)

D. (U) SCHEDULE PROFILE: See attached

Program Element: 0603553N
Project Number: V1704
Title: Surface ASW Advanced Development

Schedule Profile



FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603561N
PROGRAM ELEMENT TITLE: Advanced Submarine System Development

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
F2033	Advanced Submarine Systems Development (transitions to S2033 in FY96)								
	62,268	0	0	0	0	0	0	0	0
S2033	Advanced Submarine Systems Development								
	0	49,125	24,248	24,350	30,908	29,944	29,317	CONT.	CONT.
F2034	R&D Submarine (transitions to S2034 in FY96)								
	3,876	0	0	0	0	0	0	0	0
S2034	R&D Submarine								
	0	2,312	0	0	0	0	0	0	104,599
F2177	New Design HM&E								
	15,800	2,433	2,152	0	0	0	0	0	144,268
TOTAL	81,944	53,870	26,400	24,350	30,908	29,944	29,317	CONT.	CONT.

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This program supports innovative research and development in submarine technologies and the subsequent evaluation, demonstration, and validation for submarine platforms. It will increase the submarine technology base and provide subsystem design options not currently feasible.

(U) Project S2033 (formerly F2033) identifies the most promising and emerging technologies and transitions them into specific demonstration/validation efforts. The project transitions technologies developed by Navy technology bases, the private sector, and the Defense Advanced Research Projects Agency (DARPA) Tactical Technology Office. Advanced systems developed under this program have potential for backfit into existing classes of submarines, supporting emerging requirements, and systems technology insertion into future submarine designs. Research and development (R&D) investment factors used to select these technologies include: economic environment and return on investment; mission enhancement; and safety and survivability. The project also conducts an SSN Security Program (SSP) to develop techniques and devices that decrease the detection vulnerability of attack submarines, specifically operating in littoral environments; supports two Information Exchange

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603561N
PROGRAM ELEMENT TITLE: Advanced Submarine System Development

Programs with the United Kingdom (UK), one on submarine electromagnetic silencing and the second on submarine platform equipment, systems and hull technology; operates the Large Scale Vehicle (LSV) to provide at-sea test capability for propulsor, acoustic and non-acoustic signature reduction, and remote vehicle R&D; operates the Hydrodynamic/Hydroacoustic Technology Center (H/HTC) to enhance our ability to accurately, computationally predict hydrodynamic and hydroacoustic performance of submerged bodies; and provides life cycle support for the R&D Submarine modifications.

(U) Project S2034 (formerly F2034) provides resources to convert an attack submarine to a dedicated R&D platform without loss of mission capability. This project provides a dedicated at-sea platform for testing and evaluating advanced systems technologies applicable to existing and the next generation SSN.

(U) Project F2177 is dedicated to the New Attack Submarine (New SSN). The primary goal of the project is to develop affordable yet capable submarine platform specific systems by evaluating a broad range of system technology alternatives and examining cost reduction, producibility improvement, and technical risk reduction.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under DEMONSTRATION & VALIDATION because it develops and integrates hardware for experimental tests related to specific ship or aircraft applications.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603561N
PROGRAM ELEMENT TITLE: Advanced Submarine System Development

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
F2033 Advanced Submarine Systems Development	62,268	0	0	0	0	0	0	0	0
S2033 Advanced Submarine Systems Development	0	49,125	24,248	24,350	30,908	29,944	29,317	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: Project S2033 identifies the most promising and emerging technologies and transitions them into specific demonstration/validation efforts. The project transitions technologies developed by Navy technology bases, the private sector, and the DARPA Tactical Technology Office. Advanced systems developed under this program have potential for backfit into existing classes of submarines, supporting emerging requirements, and systems technology insertion into future submarine designs. R&D investment factors used to select these technologies include: economic environment and return on investment; mission enhancement; and safety and survivability. The project also conducts the SSP to develop techniques and devices that decrease the detection vulnerability of attack submarines specifically operating in littoral environments; supports two Information Exchange Programs with the UK, one on submarine electromagnetic silencing and the second on submarine platform equipment, systems and hull technology; operates the LSV to provide at-sea test capability for propulsor, acoustic and non-acoustic signature reduction, and remote vehicle R&D; operates the H/HTC to enhance our ability to accurately, computationally predict hydrodynamic and hydroacoustic performance of submerged bodies; and provides life cycle support for the R&D Submarine modifications.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS:

- (U) ($2,140) Continued concept integration studies (e.g. shipboard gray-water treatment, unmanned aerial vehicle hand-off platform integration, alternatives for submarine weapons stowage, handling, and launch configuration, and development of replacement candidate for bow plane design).

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603561N PROGRAM ELEMENT TITLE: Advanced Submarine System Development PROJECT NUMBER: S2033 PROJECT TITLE: Advanced Submarine Systems Development

- (U) ($8,035) Continued operations and support for the LSV (testing candidate propulsors for New SSN, acoustic signature programs, and SEAWOLF propulsor performance validation); conducted restricted availability (RAV) for installation of new main propulsion battery, ship control computer replacement, and on-board data acquisition system upgrade. Commenced advance planning for a major modification.

- (U) ($300) Terminated SUPRELITE fatigue testing (Phase II) because of budget cuts.

- (U) ($4,256) Investigated the cause of SUPREJET cavitation problems and restored the operational fleet unit to class configuration.

- (U) ($1,600) Continued operations and support for the H/HTC including hardware/software maintenance and hardware upgrades.

- (U) ($1,515) Continued development of modeling and simulation procedures to address hydrodynamic issues integral to operational submarines and future ship designs (e.g., code certifications and design tool integration).

- (U) ($3,737) Continued development of a Situation Awareness System (SAS) for SSN's operating in shallow water littoral regions. Assumed responsibility for Tactical Decision Aids for Submarine Security (TDASS) module development. Completed Deployable Active Test Device analysis and prepared DATD for storage/later use, e.g. Extended Echo Ranging/Leave Behind Source. Program management responsibility continues under Program Executive Officer, Undersea Warfare.

- (U) ($2,280) Completed the critical component life and performance testing in the electric drive program. Initiated feasibility assessment of advanced stern concept component technologies (year 2010+). Initiated development of integrated R&D plan for hull, mechanical, and electrical (HM&E) component technologies.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603561N PROJECT NUMBER: S2033
PROGRAM ELEMENT TITLE: Advanced Submarine System Development PROJECT TITLE: Advanced Submarine Systems Development

- (U) ($25,409) Continued evaluation of the electromagnetic silencing program: continued joint United States (US)/ UK deepwater electromagnetic silencing test and the US test of the mobile deep array. Continued development and testing of a prototype composite main propulsion shaft. Continued Office of Naval Research (ONR)-NAVSEA jointly funded AVR program. Completed fabrication of land based test facilities for the advanced vibration reducer (AVR) and composite shaft programs. Continued development of propulsor systems, arc fault prevention, and DARPA radiated noise project F. Continued development of shock and acoustic isolation devices. Continued demonstration of an elastomeric ejection system recharge pump. Fabricated and tested an elastomeric disk with acceptable acoustic performance of the firing valve.

- (U) ($10,130) Completed demonstration and validation efforts and transitioned evaluation of pressure hull design criteria, optimized weld joint design, development of non-chlorofluorocarbon air conditioning and refrigeration plants, and acoustic coatings to PE 0604558N. Conducted at-sea testing and completed validation of analytical modeling techniques for hull dynamic strength and integrated it into the specifications for the New SSN. Further development will be shelved until the opportunity arises to insert into the fleet. Conducted feasibility study on fiber brush current collectors.

- (U) ($2,866) FY96 SSN Security effort forward funded with FY95 dollars. Continue with the development of littoral SSN Security projects (e.g. Situational Awareness, Tactical Operations, Assessments, and TDASS modules). Complete development/fabrication of prototype portable lidar early warning device.

2. (U) FY 1996 PLAN:

- (U) ($1,717) Continue concept integration studies (e.g. composite most aggressive feature, support for the Science and Technology/R&D working group, and impact studies on the ship system perspective for stealth and affordability issues).

- (U) ($5,990) Continue operations and support for the LSV. Continue advanced planning for a major LSV modification and initiate long lead time material procurement.

- (U) ($1,116) Continue operations and support for the H/HTC including hardware/software maintenance and hardware upgrades.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603553N PROJECT NUMBER: V1704
PROGRAM ELEMENT TITLE: Surface Anti-Submarine Warfare PROJECT TITLE: ASW Advanced Development

- (U) ($78) Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15 U.S.C.638.

3. (U) FY 1997 PLAN:

- (U) ($3,964) Complete development of mid-frequency receive array test bed components (array, towing system, receiver) and begin TARS integration. Conduct at-sea demonstration of joint tactical control development on surface combatant. Perform warfare payoff, performance modeling, and operational evaluations.

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996 President's Budget:	6,572	5,846	4,571
(U) Adjustments from PRESBUDG:	-103	-190	-607
(U) FY 1997 PRESBUDG Submit:	6,469	5,656	3,964

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: Funding has been decreased by $103K in FY1995 due to general reductions. Funding in FY1996 reduced by $167K due to Congressional undistributed general and inflation reductions. Funding in FY1997 reduced by $343K due to poor expenditures and $264K for revised inflation estimates and other minor pricing adjustments.

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

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

(U) RELATED RDT&E

(U) PE 0602121N (Surface Ship & Submarine HM&E Technology)
(U) PE 0603561N (Advanced Submarine System Development)

D. (U) SCHEDULE PROFILE: See attached

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603561N PROGRAM ELEMENT TITLE: Advanced Submarine System Development PROJECT NUMBER: S2033 PROJECT TITLE: Advanced Submarine Systems Development

- (U) ($451) Transfer to Project S2034 for USS MEMPHIS (SSN691) R&D modifications.
- (U) ($55) Fund the Joint Service Deskbook.

3. (U) FY 1997 PLAN:

- (U) ($1,700) Continue concept integration studies.
- (U) ($6,300) Continue operations and support for the LSV. Complete support for test and demonstration of the advanced hybrid advanced technology demonstration.
- (U) ($1,200) Continue operation and support for the H/HTC including hardware/software maintenance and hardware upgrades.
- (U) ($1,500) Continue development of modeling and simulation procedures to address hydrodynamic issues integral to operational submarines and future ship designs (e.g., code certifications and design tool integration).
- (U) ($3,700) Conduct SAS demonstration and sea tests; assess tactical utility of optical sensors; conduct sea test of lidar wake watcher sensor; develop littoral area tactics and countermeasures. Program management responsibility continues under PEO-USW.
- (U) ($1,400) Commence life cycle support for the R&D Submarine modifications (transitioned from PE 0603561N/S2034).
- (U) ($2,580) Continue identification and feasibility assessments of stern HM&E component technologies. Commence proof of concept hardware demonstration for scaled models of the integrated stern component technologies.
- (U) ($400) Continue refining elastomeric disk design, fabricating additional disks, and testing.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603561N PROGRAM ELEMENT TITLE: Advanced Submarine System Development PROJECT NUMBER: S2033 PROJECT TITLE: Advanced Submarine Systems Development

- (U) ($5,468) Complete demonstration/validation phase of propulsor systems and arc fault prevention. Transition programs to PE 0604558N. Install AVR system on USS MEMPHIS (SSN 691) and conduct at-sea system evaluation thereby completing the ONR-NAVSEA jointly funded program. The decision for follow-on development will be made at the completion of this program. Complete development and testing of shock and acoustic isolation devices and integrate into the specifications and design of the New SSN.

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996 President's Budget:	61,718	30,860	28,972
(U) Adjustments from PRESBUDG:	+550	+18,265	-4,724
(U) FY 1997 PRESBUDG Submit:	62,268	49,125	24,248

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY95: The FY95 increase provided funding for the unmanned aerial vehicle hand-off platform integration task. FY96: Congress increased the FY96 budget by $20,000K for advanced submarine technologies. Congressional undistributed general and inflation reductions ($1,137K), and revised DoD inflation rates and other minor pricing adjustments ($598K). FY97: $1,500K of the FY97 reduction resulted from cancellation of funding for the Intermediate Scale Measurement System Test Range. $2,000K was taken from this project to help fund a remote mine hunting system under PE 0603502N Project Q0260. Revised inflation estimates and other pricing adjustments ($1,224K).

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

000251

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603561N
PROGRAM ELEMENT TITLE: Advanced Submarine System Development

PROJECT NUMBER: S2033
PROJECT TITLE: Advanced Submarine Systems Development

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

(U) RELATED RDT&E:

(U) PE 0101224N (SSBN Security & Survivability Program)
(U) PE 0603555N (Sea Control and Littoral Warfare Technology Demonstration)
(U) PE 0603569E (ARPA Advanced Submarine Technology Program)
(U) PE 0603792N (Advanced Technology Transition)
(U) PE 0604558N (New Design SSN Development)

D. (U) SCHEDULE PROFILE:

	FY 1995	FY 1996	FY 1997	TO COMPLETE
Program Milestones	Demo fiber brush technology under electric drive Terminated SUPRELITE Transitioned projects to New SSN Completed LSV support for SSN-21 propulsor development prog.	Transition projects to New SSN Continue LSV support for New SSN propulsor dev. program Complete WATTS trials on LSV	1Q Transition of R&D Sub Life Cycle Support from F2034 Transition projects to New SSN Continue LSV support for New SSN propulsor development program	

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603561N
PROGRAM ELEMENT TITLE: Advanced Submarine System Development

PROJECT NUMBER: S2033
PROJECT TITLE: Advanced Submarine Systems Development

	FY 1995	FY 1996	FY 1997	TO COMPLETE
	Transitioned F2177 into F2033 (New SSN related projects) Continued LSV support for New SSN propulsor dev. program	Commence LSV support for the test & demo of the advanced hybrid advanced tech demo	Install AVR system on USS MEMPHIS (SSN 691) Complete LSV support for the test & demo of the advanced hybrid advanced tech demo US/UK commission mobile deep array (NOULD 96)	
Engineering Milestones	Completed fab. of AVR and composite shaft land based test facilities Replaced H/HTC mainframes Upgraded LSV ship control computer; replaced LSV batteries with commercial equip. Repaired SUPREJET	Complete dev & fab. of prototype lidar early warning device Complete AVR land based test Complete land based test of thermal ionization detector for arc fault system	Complete sea trial with arc fault wide band optic sensor Deliver composite shaft	

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603561N
PROGRAM ELEMENT TITLE: Advanced Submarine System Development

PROJECT NUMBER: S2033
PROJECT TITLE: Advanced Submarine Systems Development

	FY 1995	FY 1996	FY 1997	TO COMPLETE
	Upgraded LSV onboard data acq. system to state-of-the-art high density digital recording system	Complete study of external electric drive concepts & develop draft tech development plan		
T&E Milestones	Fabricated and tested an elastomeric disk	Conducted at-sea testing for hull dynamic strength program facilities Demo aspects of EM silencing system (NOULD 95) US test of the mobile deep array Conduct full-scale acoustic and shock testing of isolated deck modules	Conduct AVR at-sea system eval.	

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603561N
PROGRAM ELEMENT TITLE: Advanced Submarine System Development

PROJECT NUMBER: S2033
PROJECT TITLE: Advanced Submarine Systems Development

FY 1995	FY 1996	FY 1997	TO COMPLETE
	Complete demo of nonintrusive means to measure and compensate for fluid & structure borne noise in sea connected systems		

Contract Milestones

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603561N
PROGRAM ELEMENT TITLE: Advanced Submarine System Development

PROJECT NUMBER: S2033
PROJECT TITLE: Advanced Submarine Systems Development

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

Project Cost Categories	FY 1995	FY 1996	FY 1997
a. Hardware Development	42,065	26,189	12,740
b. Software Development	1,328	450	450
c. Developmental T&E	10,672	8,687	6,158
d. Countermeasures Dev	6,603	889	3,700
e. R&D Facilities Mgmt	1,600	1,116	1,200
f. Sensors & Processing	0	9,040	0
g. EFOG-M	0	2,000	0
h. SBIR Assessment	0	699	0
i. Joint Services Deskbook	0	55	0
Total	62,268	49,125	24,248

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603561N PROGRAM ELEMENT TITLE: Advanced Submarine System Development PROJECT NUMBER: S2033 PROJECT TITLE: Advanced Submarine Systems 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 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Product Development										
TRACOR Austin, Texas	C/CPFF	12/87	CONT.	CONT.	5,901	1,056	1,902	1,958	CONT.	CONT.
Newport News Shipbuilding, Norfolk, Virginia	S/CPFF	03/90	CONT.	CONT.	15,054	3,818	2,554	1,782	CONT.	CONT.
General Dynamics /EB Div., Groton, CT	S/CPFF	03/92	CONT.	CONT.	19,231	10,310	5,660	2,505	CONT.	CONT.
JHU/APL Laurel, Maryland	S/CPFF	10/89	CONT.	CONT.	15,240	6,006	3,290	3,415	CONT.	CONT.
AT&T Whippany, New Jersey	S/CPFF	10/94	3,627	3,627	1,405	2,222	0	0	0	3,627
NAVSURFWARCEN Bethesda & Annapolis, Maryland; Bayview, Idaho; Portsmouth, Virginia	WR	Var	CONT.	CONT.	52,390	19,132	12,013	6,215	CONT.	CONT.
NAVUNSEAWARCENDET New London, Connecticut; Newport, Rhode Island	WR	Var	CONT.	CONT.	7,590	2,152	5,498	425	CONT.	CONT.
Miscellaneous			CONT.	CONT.	40,053	7,998	5,039	3,315	CONT.	CONT.

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603561N PROJECT NUMBER: S2033
PROGRAM ELEMENT TITLE: Advanced Submarine System Development PROJECT TITLE: Advanced Submarine Systems Development

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Support and Management										
Miscellaneous			CONT.	CONT.	2,389	819	964	685	CONT.	CONT.
Test and Evaluation										
NAVSURFWARCEN Bethesda and Annapolis, MD; Bayview, Idaho;	WR	Var	CONT.	CONT.	5,540	2,224	1,400	480	CONT.	CONT.
NAVUNSEAWARCENDET New London, Connecticut; Newport, Rhode Island	WR	Var	6,584	6,584	0	756	5,828	0	6,584	6,584
AT&T Whippany, NJ	C/CPFF	10/94	5,300	5,300	0	0	2,500	2,800	0	5,300
GD/EBDIV Groton, CT	C/CPFF	03/92	CONT.	CONT.	1,960	2,852	560	48	CONT.	CONT.
Miscellaneous			CONT.	CONT.	3,930	2,923	1,917	620	103	CONT.

GOVERNMENT FURNISHED PROPERTY Not applicable.

	Total FY 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Subtotal Product Development	156,864	52,694	35,956	19,615	CONT.	CONT.
Subtotal Support and Management	2,389	819	964	685	CONT.	CONT.
Subtotal Test and Evaluation	11,430	8,755	12,205	3,948	CONT.	CONT.
Total Project	170,683	62,268	49,125	24,248	CONT.	CONT.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603561N
PROGRAM ELEMENT TITLE: Advanced Submarine System Development

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
F2034 R&D Submarine	3,876	0	0	0	0	0	0	0	0
S2034 R&D Submarine	0	2,312	0	0	0	0	0	0	104,599

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project provides resources to convert USS MEMPHIS (SSN 691) to a dedicated R&D platform without loss of mission capability. This project provides a dedicated at-sea platform for test and evaluation of advanced submarine systems technologies applicable to existing and the next generation SSNs. Developments from Navy, ARPA, and industry are accommodated. The program completes the design and prefabrication of several modifications (i.e., instrumentation system, a test center, support services, penetrations, weapons launch control system, turtleback structure, and stern planes structure). These modifications are intended to enhance the ability of the R&D Submarine to rapidly and more affordably test multiple, high payoff technologies. The instrumentation system, test center, weapon launch control system, support services, and penetrations are being installed during the conversion overhaul. Installation of several other modifications has been deferred until required to support major projects. This project also funds R&D project support. The USS MEMPHIS will maintain its warfighting capability in addition to a principal mission of supporting submarine R&D.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS:

- (U) ($1,411) Completed design, material procurement, and prefabrication of all modifications.
- (U) ($1,414) Continued installation of the instrumentation system, test center, weapons launch control system, support services, and penetrations.
- (U) ($75) Continued engineering support for the installation.

- (U) ($105) Certified installation of weapons launch system modification.
- (U) ($359) Continued technical review of test documentation.
- (U) ($145) Commenced life cycle support of R&D modifications.
- (U) ($329) Coordinated at-sea R&D project evaluations.
- (U) ($38) Developed instructional material.

2. (U) FY 1996 PLAN:

- (U) ($375) Complete installation of the instrumentation system, test center, weapons launch control system, support services, and penetrations.
- (U) ($280) Complete engineering support for the installation.
- (U) ($496) Complete technical review of test documentation.
- (U) ($100) Complete certification of weapons launch system modification.
- (U) ($526) Continue life cycle support of R&D modifications. Life cycle support will transition to PE 0603561N/S2033 beginning in FY 1997.
- (U) ($512) Coordinate at-sea R&D project evaluations.
- (U) ($23) Portion of extramural program reserved for SBIR assessment in accordance with 15 U.S.C.638.

3. (U) FY 1997 PLAN: Not applicable.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603561N PROGRAM ELEMENT TITLE: Advanced Submarine System Development PROJECT NUMBER: S2034 PROJECT TITLE: R&D Submarine

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996 President's Budget:	3,876	2,378	0
(U) Adjustments from PRESBUDG:	0	-66	0
(U) FY 1997 PRESBUDG Submit:	3,876	2,312	0

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY 1996 budget was reduced $46K for Congressional undistributed general and inflation reductions, and reduced $20K due to revised DoD inflation rates and other minor pricing adjustments.

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

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

(U) RELATED RDT&E:

(U) PE 0603504N (Advanced Submarine Combat Systems Development)
(U) PE 0603562N (Submarine Tactical Warfare Systems)
(U) PE 0603569E (ARPA Advanced Submarine Technology Program)
(U) PE 0603570N (Advanced Nuclear Power Systems)
(U) PE 0604503N (Submarine System Equipment Development)
(U) PE 0604558N (New Design SSN Development)
(U) PE 0604561N (SSN-21 Development)
(U) PE 0604562N (Submarine Tactical Warfare System)
(U) PE 0604567N (Ship Contract Design/Live Fire T&E)

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603561N
PROGRAM ELEMENT TITLE: Advanced Submarine System Development

PROJECT NUMBER: S2034
PROJECT TITLE: R&D Submarine

D. (U) SCHEDULE PROFILE:

	FY 1995	FY 1996	FY 1997	TO COMPLETE
Program Milestones		4Q Complete R&D mods		
Engineering Milestones				
T&E Milestones				
Contract Milestones				

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: March 19965

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603561N
PROGRAM ELEMENT TITLE: Advanced Submarine System Development

PROJECT NUMBER: S2034
PROJECT TITLE: R&D Submarine

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

Project Cost Categories	FY 1995	FY 1996	FY 1997
a. Hardware Development	3,376	2,289	0
b. Software Development	500	0	0
c. Developmental T&E	0	0	0
d. SBIR Assessment	0	23	0
Total	3,876	2,312	0

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603561N PROJECT NUMBER: S2034
PROGRAM ELEMENT TITLE: Advanced Submarine System Development PROJECT TITLE: R&D Submarine

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 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Product Development										
General DynamicsC/CPAF /EB Div., Groton, CT		05/90	63,418	63,418	61,268	1,344	806	0	0	63,418
PNSY Portsmouth, NH	WR	Var	30,921	30,921	29,132	1,414	375	0	0	30,921
Miscellaneous			9,093	9,093	6,885	1,097	1,111	0	0	9,093
Support and Management										
Miscellaneous			1,167	1,167	1,126	21	20	0	0	1,167
Test and Evaluation					0	0	0	0	0	0

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: March 1996

BUDGET ACTIVITY: 4
PROGRAM ELEMENT: 0603561N
PROGRAM ELEMENT TITLE: Advanced Submarine System Development
PROJECT NUMBER: S2034
PROJECT TITLE: R&D Submarine

GOVERNMENT FURNISHED PROPERTY Not applicable.

	Total FY 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Subtotal Product Development	97,285	3,855	2,292	0	0	103,432
Subtotal Support and Management	1,126	21	20	0	0	1,167
Subtotal Test and Evaluation	0	0	0	0	0	0
Total Project	98,411	3,876	2,312	0	0	104,599

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET | DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603561N
PROGRAM ELEMENT TITLE: Advanced Submarine System Development

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
F2177 New Design HM&E	15,800	2,433	2,152	0	0	0	0	0	144,268

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project identifies, evaluates, and selectively develops critical technologies for the New SSN design to enable an affordable, capable submarine. Efforts are directed at maturing promising technology alternatives into existing submarine systems to permit transition to Engineering Development (6.5). These efforts are highly integrated with industry, shipbuilder, and related Department of Defense R&D programs to provide technical confidence in HM&E technologies being selected during the New SSN design process.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS:

- (U) ($15,800) Completed this phase of propulsor development and propulsion equipment to support milestone II decision. Completed breadboard testing of reverse osmosis desalination. Continued modifications to underwater shock analysis computer codes and shock testing machines for minimization of shock qualification program costs. Level of effort contract awarded. Transitioned completed programs to PE 0604558N.

2. (U) FY 1996 PLAN:

- (U) ($2,395) Continue modification to underwater shock analysis computer codes and shock testing machines for minimization of shock qualification program costs. Integrate shock analysis codes with computer aided design codes.

- (U) ($38) Portion of extramural program reserved for SBIR Assessment in accordance with 15 U.S.C.638.

3. (U) FY 1997 PLAN:

- (U) ($2,152) Complete modification to underwater shock analysis codes and development of shock testing machines and transition to PE 0604558N.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603561N PROGRAM ELEMENT TITLE: Advanced Submarine System Development PROJECT NUMBER: F2177 PROJECT TITLE: New Design HM&E

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996 President's Budget:	15,800	2,510	2,630
(U) Adjustments from PRESBUDG:	0	-77	-478
(U) FY 1997 PRESBUDG Submit:	15,800	2,433	2,152

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 96: Congressional undistributed and inflation reductions ($49K); and revised DoD inflation rates ($28K). FY 97: Revised inflation estimates and other minor pricing adjustments ($478K).

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

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

	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
(U) SCN Line PE# 0204281N									
201300									
	0	678,839	296,186	2,702,110	544,001	1,899,806	1,136,681	51,370,312	58,627,935
201310									
	0	96,358							

(U) RELATED RDT&E:

(U) PE 0602323N (Submarine Technology)
(U) PE 0603570N (Advanced Nuclear Power Systems)
(U) PE 0604558N (New Design SSN Development)
(U) PE 0604567N (Ship Contract Design/Live Fire T&E)

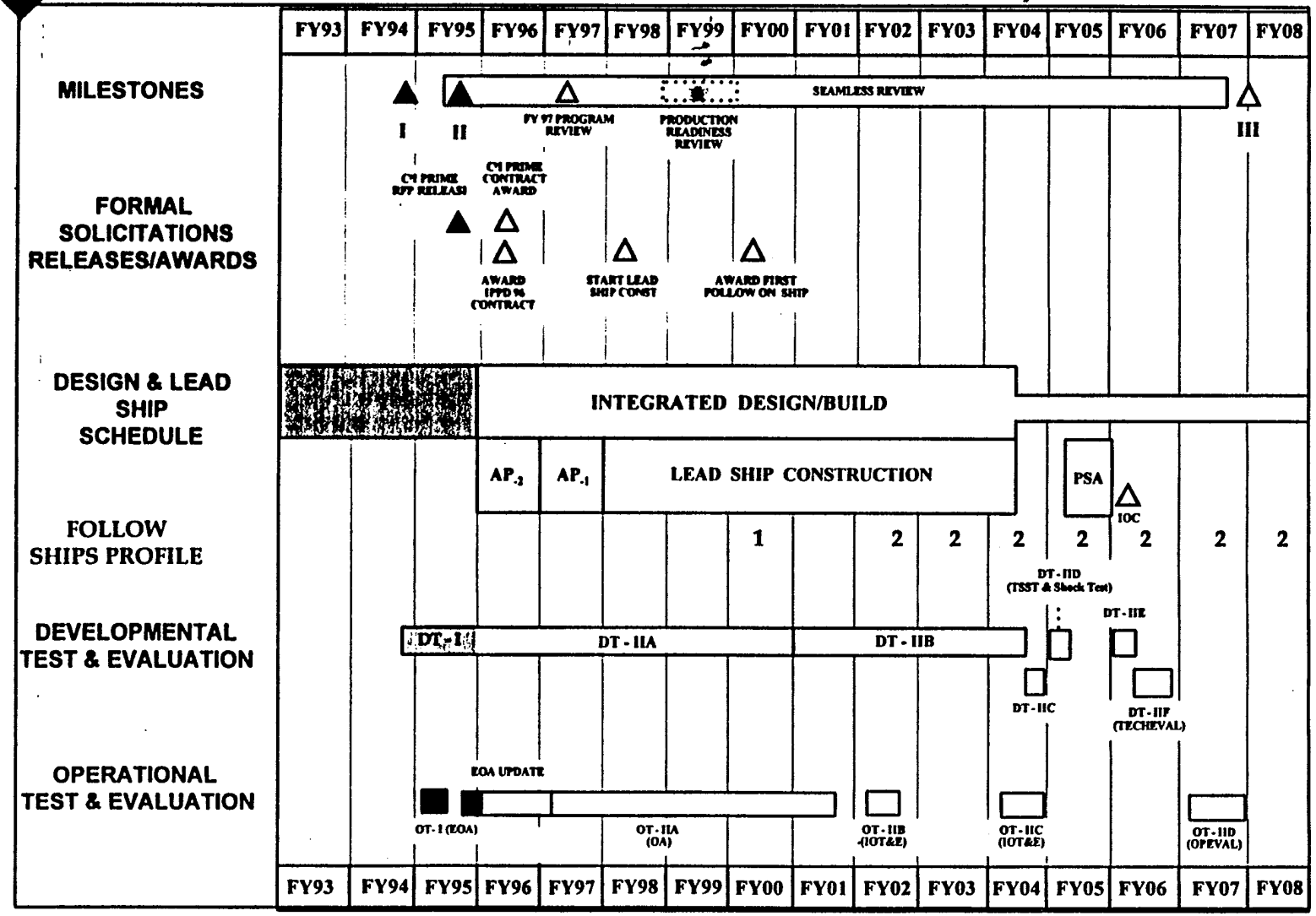
D. (U) SCHEDULE PROFILE: See attached.

New Attack Submarine (NSSN)

Program Schedule

2/29/96

PROGRAM ELEMENT: 0603561N/F2177



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FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603561N PROJECT NUMBER: F2177
PROGRAM ELEMENT TITLE: Advanced Submarine System Development PROJECT TITLE: New Design HM&E

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

Project Cost Categories	FY 1995	FY 1996	FY 1997
a. New SSN Advanced Development Propulsor/Shock	15,800	2,395	2,152
b. SBIR Assessment	0	38	0
Total	15,800	2,433	2,152

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603561N PROJECT NUMBER: F2177
PROGRAM ELEMENT TITLE: Advanced Submarine System Development PROJECT TITLE: New Design HM&E

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 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Product Development										
PSU/ARL State College, PA	S/CPFF	12/92	7,962	7,962	4,307	3,655	0	0	0	7,962
General Dynamics /EB Div, Groton, CT	S/CPFF	7/90	14,000	14,000	14,000	0	0	0	0	14,000
General Dynamics /EB Div, Groton, CT	S/CPFF	10/89	21,009	21,009	21,009	0	0	0	0	21,009
General Dynamics /EB Div, Groton, CT	S/CPFF	12/93	3,400	3,400	3,400	0	0	0	0	3,400
General Dynamics /EB Div, Groton, CT	S/CPFF	3/92	5,186	5,186	5,186	0	0	0	0	5,186
General Dynamics /EB Div, Groton, CT	S/CPFF	1/95	1,645	1,645	0	1,645	0	0	0	1,645
EG&G Rockville, MD	S/CPIF	06/90	1,607	1,607	1,607	0	0	0	0	1,607
NAVSURFWARCEN Bethesda and Annapolis, MD	WR	VAR	51,561	51,561	37,211	9,803	2,395	2,152	0	51,561
Newport News Shipbuilding, Norfolk, VA	S/CPFF	03/90	9,851	9,851	9,851	0	0	0	0	9,851
NAVUNSEAWARCENDIV Newport, RI	RC	VAR	1,256	1,256	1,256	0	0	0	0	1,256
NAVUNSEAWARCENDIV Newport, RI	WR	VAR	15,967	15,967	15,967	0	0	0	0	15,967

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603561N PROJECT NUMBER: F2177
PROGRAM ELEMENT TITLE: Advanced Submarine System Development PROJECT TITLE: New Design HM&E

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Miscellaneous		VAR	7,575	7,575	6,840	697	38	0	0	7,575
Support and Management										
Miscellaneous	VAR	VAR	3,249	3,249	3,249	0	0	0	0	3,249
Test and Evaluation										

GOVERNMENT FURNISHED PROPERTY: Not applicable.

	Total FY 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Subtotal Product Development	120,634	15,800	2,433	2,152	0	141,019
Subtotal Support and Management	3,249	0	0	0	0	3,249
Subtotal Test and Evaluation	0	0	0	0	0	0
Total Project	123,883	15,800	2,433	2,152	0	144,268

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FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603562N
PROGRAM ELEMENT TITLE: Submarine Tactical Warfare Systems

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
F0770 Advanced Submarine Support Equipment Program (ASSEP)	920	2,311	2,440	3,728	4,538	4,352	4,397	CONT.	CONT.
V1739 Submarine Special Operations Support Development	6,301	2,483	2,138	2,061	2,445	2,842	3,480	CONT.	CONT.
TOTAL	7,221	4,794	4,578	5,789	6,983	7,194	7,877	CONT.	CONT.

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Submarine Tactical Warfare Systems program element is comprised of the Advanced Submarine Support Equipment Program and the Submarine Special Operations Support Development Program. The overall goal of the program is to improve submarine operational effectiveness through the development of advanced Research and Development (R&D) and Electronic Warfare Support Measures (ESM) technologies. The Submarine Tactical Warfare Systems program responds to the increased threat of Naval activity in the Littorals and the continuing threat of submarine and surface ship activity in regions of the world through the development of advanced submarine R&D technology to provide improved operational capability in shallow water regions. Particular emphasis is placed in the areas of sonar operability and maintainability, Littoral operations, mine warfare, tactical surveillance, and other submarine support missions. Efforts include assessment of combat system effectiveness, development of Arctic shallow water specific improvements for existing sonars, development of class specific Arctic operational guidelines and the testing of ice-capable submarine support structures. This program also provides the framework for various R&D programs to conduct Test and Evaluation in shallow water and Arctic regions. The goal of the Advanced Submarine Support Equipment Program (ASSEP) is to increase submarine operational effectiveness through improvements in electronic warfare (i.e., threat warning, over-the-horizon targeting, and expanded tactical reconnaissance). A continuing need exists to improve submarine capabilities in the increasingly dense and sophisticated electromagnetic environment caused by the proliferation of complex radar, communications, and navigation equipment of potential adversaries.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under DEMONSTRATION & VALIDATION because it develops and integrates hardware for experimental test related to specific ship or aircraft applications.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603562N
PROGRAM ELEMENT TITLE: Submarine Tactical Warfare Systems

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
F0770 Advanced Submarine Support Equipment Program	920	2,311	2,440	3,728	4,538	4,352	4,397	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This program develops submarine ESM equipment technology. A continuing need exists to improve submarine capabilities in these areas to enhance operational effectiveness in the increasingly dense and sophisticated electromagnetic environment caused by the proliferation of complex radar, communications, and navigation equipment of potential adversaries. Improvements are necessary for submarine ESM to be effective in conducting the following mission areas: Joint Littoral Warfare, Joint Surveillance, Space and Electronic Warfare, Intelligence Collection, Maritime Protection and Joint Strike. Specific efforts include development of: Radar Cross Section Reduction (RCSR) Techniques, Periscope Monopulse Direction Finding (MDF) System, Sensor Technology Insertion Program (STIP), and ESM Technology Insertion Program (ESMTIP). The RCSR evaluates the vulnerability of submarine masts, periscopes and sensors to radar and infrared threats and evaluates the state of the art in radar absorbant material, resulting in potential periscope/mast engineering improvements to reduce the counter-detection threat. The MDF system is an improvement to the Type 18 Periscope which will allow the ESM system to discriminate and identify complex radar signals using direction of arrival as a primary sorting parameter. The STIP and ESMTIP programs develop submarine unique improvements to mast, periscope and hull mounted ESM electromagnetic and electro-optic sensors based on emerging technologies that are available from DOD Exploratory Development Programs, industry Independent Research and Development, and other sources. Feasibility demonstration models (FDMs) will be developed to provide a realistic method of evaluating the improvements. Some of the FDMs may be deployed on submarines for part of their testing. STIP projects will include: Laser detection; radio frequency (RF) extensions; RF bandwith improvements; passive localization; upgrades to the Photonics Mast sensors and software; and advanced antenna arrays for beam steering and high resolution direction finding enhancements. ESMTIP projects will include: improvements to signal sorting and recognition methods to support classification and identification of ESM contacts encountered during Littoral operations; signal processing improvements such as the processing of low probabiity of intercept signals; voice/language recognition and human/machine interface enhancements. Starting in FY 95 all programs funded in this project are non-acquisition category programs in accordance with NAPDD # 428-87.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603562N
PROGRAM ELEMENT TITLE: Submarine Tactical Warfare Systems
PROJECT NUMBER: F0770
PROJECT TITLE: Advanced Submarine Support Equipment Program

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS:

- (U) ($186) Initiated STIP.
- (U) ($58) Continued RCSR techniques and materials investigation.
- (U) ($676) Continued advanced development of Periscope MDF FDM.

2. (U) 1996 PLAN:

- (U) ($220) Continue RCSR techniques and materials investigation.
- (U) ($552) Complete Periscope MDF FDM development.
- (U) ($1,508) Continue STIP.
- (U) ($31) Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15 U.S.C. 638.

3. (U) FY 1997 PLAN:

- (U) ($245) Continue RCSR techniques and materials investigation.
- (U) ($1,843) Continue STIP.
- (U) ($352) Initiate ESMTIP.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603562N
PROGRAM ELEMENT TITLE: Submarine Tactical Warfare Systems
PROJECT NUMBER: F0770
PROJECT TITLE: Advanced Submarine Support Equipment Program

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996 President's Budget:	933	2,409	2,588
(U) Adjustments from PRESBUDG:	-13	-98	-148
(U) FY 1997 PRESBUDG Submit:	920	2,311	2,440

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: Decrease of $13K in FY 95 results from a BTRA 95-21. Decrease of $98K in FY96 results from Congressional undistributed, general and inflation reductions, and revised Dod inflation rates. Decrease of $148K in FY97 results from revised inflation estimates and other minor pricing 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 0604503N (Submarine System Equipment Development)

D. (U) SCHEDULE PROFILE: Not applicable.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603562N
PROGRAM ELEMENT TITLE: Submarine Tactical Warfare Systems

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
V1739 Submarine Special Operations Support Development	6,301	2,483	2,138	2,061	2,445	2,842	3,480	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This program responds to the increased threat of Naval activity in the Littoral and the continuing threat of submarine and surface ship activity in all regions of the world through the development of advanced submarine capabilities and concepts. It places particular emphasis in the areas of sonar operability, Littoral operations, mine warfare, tactical surveillance, and other submarine support missions. Efforts include assessment of combat system effectiveness, development of shallow water (high frequency) improvements for existing sonars for use in Littoral and Arctic regions, testing of ice-capable submarine structures, and development of class specific Arctic shallow water operational guidelines. This program also provides the framework for various Research and Development (R&D) programs to conduct Test and Evaluation in the shallow water and Arctic regions.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS:

- (U) ($947) Conducted hull structure data analysis.
- (U) ($2,813) Completed transition of EXUS technology to the High Frequency Sonar Program (HFSP) Development.
- (U) ($2,541) Conducted Arctic Science Exercise and prepared for ICEX 1-96.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603562N
PROGRAM ELEMENT TITLE: Submarine Tactical Warfare Systems

PROJECT NUMBER: V1739
PROJECT TITLE: Submarine Special Operations Support Development

2. (U) FY 1996 PLAN:

- (U) ($2,381) Conduct/support an Arctic Science Exercise, ICEX 1-96 and ICEX 2-96.
- (U) ($65) Provide updates to the Naval Warfare Publications concerning routine and emergency under-ice surfacing operations.
- (U) ($37) Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15 U.S.C.638.

3. (U) FY 1997 PLAN:

- (U) ($2,138) Conduct/support an Arctic Science Exercise and plan for ICEX 1-98.

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996 President's Budget:	6,388	2,661	1,798
(U) Adjustments from PRESBUDG:	-87	-178	+340
(U) FY 1997 PRESBUDG Submit:	6,301	2,483	2,138

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: Decrease of $87K in FY 1995 results from BTRA 95-21 to support PE 0603502N/V2094 Unmanned Underwater Vehicle (UUV) effort. Decrease of $178K in FY 1996 results from Congressional undistributed general and inflation reductions and revised Dod inflation rates. Congress provided $3.5 million to continue development of the Passive Subsurface Topographical Defense and Navigation system submarine tactical navigation system. This $3.5 million was proposed for rescission since this lower priority effort was not budgeted. Increase of $340K in FY 1997 is to conduct Arctic Research Operation.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603562N
PROGRAM ELEMENT TITLE: Submarine Tactical Warfare Systems

PROJECT NUMBER: V1739
PROJECT TITLE: Submarine Special Operations Support Development

(U) Schedule: Increased funding will allow Arctic Science Exercise 97 and ICEX 1-98 to occur on schedule.

(U) Technical: Not applicable.

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

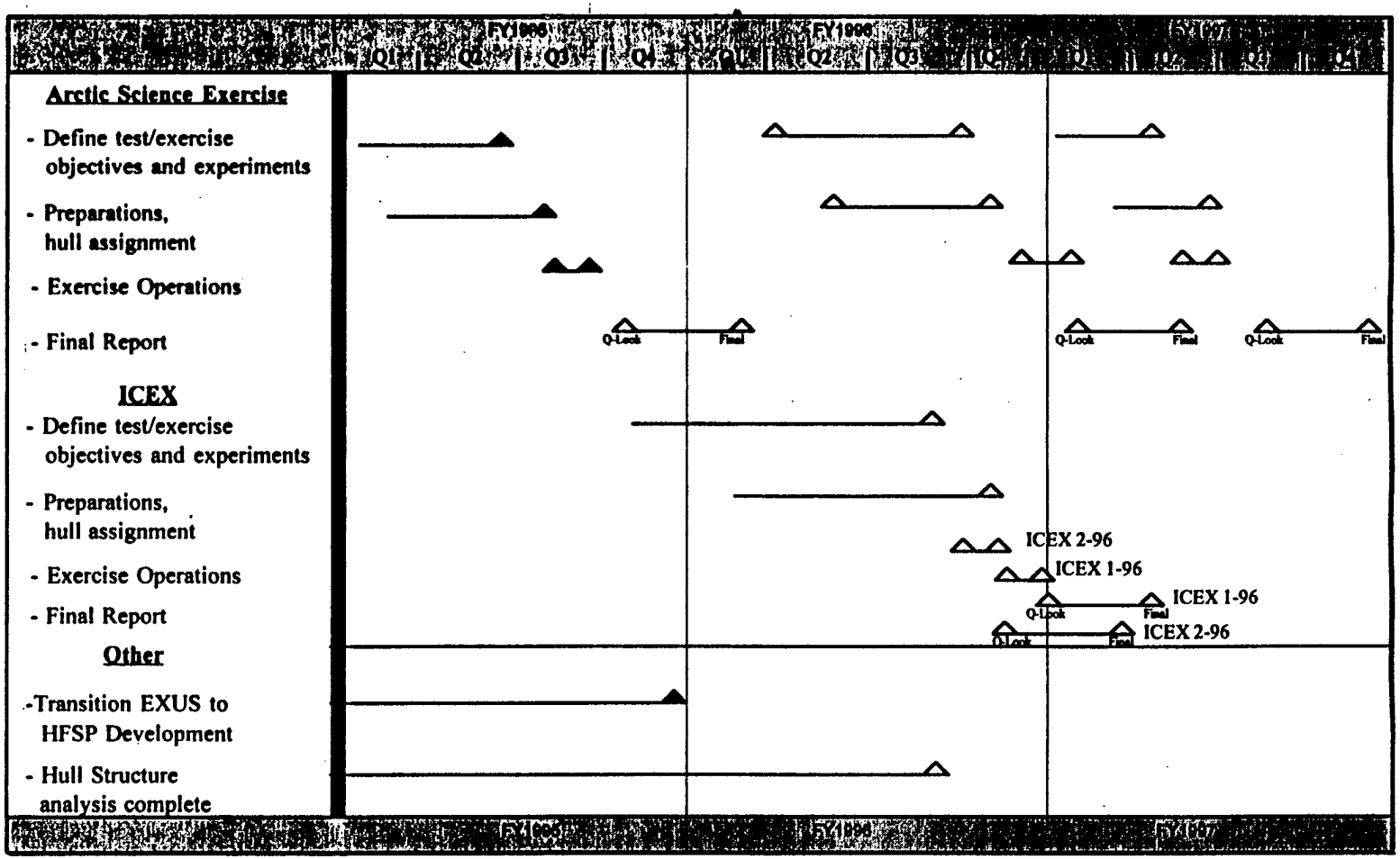
(U) RELATED RDT&E:

(U) PE 0602323N Submarine Technology provides technologies for advanced development efforts.
(U) PE 0602435N Ocean and Atmospheric Technology provides technologies for advanced development efforts.
(U) PE 0603504N Advanced Submarine Combat Systems Development
(U) PE 0604524N Submarine Combat System incorporates Arctic-specific improvements.

D. (U) SCHEDULE PROFILE: See attached.

Program Element: 0603562N
Project Number: V1739
Title: Submarine Special Operations Support Development

Schedule Profile



FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1995

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603563N
PROGRAM ELEMENT TITLE: Ship Concept Advanced Design

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
S2196 Design Tools, Plans and Concepts	28,484	52,044	13,807	25,279	28,330	27,900	27,685	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The efforts within this PE enhance the Navy's ability to design more affordable ships with reduced manning, increased producibility, and allow greater utilization of the latest technology. The program focuses on supporting the Navy Shipbuilding Plan with state-of-the-art design tools and methods, for ship studies and developing the ship design concept studies for the new ships in that plan. Computer modeling and simulation developments will permit virtual operation and evaluation of the ship and enable reduction of ship production and support cost by allowing fleet representatives, shipbuilders and maintenance staffs to build, test, operate or repair the ship "in the computer" at a design stage where the design is flexible and where feedback and suggested changes can be incorporated relatively easily. The program provides the foundation for affordable surface ship design, construction, and life cycle support required as a first step in the integration of total ship systems, including combat systems and hull, mechanical and electrical (HM&E) systems. A key affordability concept of future designs is a use of common modules, comprised of standard components and/or standard interfaces. These modules will be used across ship types and will be integral with equipment standardization and distributed system architectures that support generic build strategies. Increased commonality will reduce the total cost of ownership and is the cornerstone of an affordable fleet. Efforts under Project S2196 transfer directly to early stage ship design in PE 0603564N, Ship Preliminary Design and Feasibility Studies.

(U) This project accomplishes the following: (1) identifies future surface ship requirements and characteristics necessary to meet future threats and support mission needs; (2) investigates new affordable ship concepts and evaluates technologies necessary to support these concepts; (3) provides design methods and automated design tools to develop and evaluate ship concepts, support early ship design, and solve pressing fleet engineering problems; (4) develops design criteria and common standards to improve affordability; (5) improves the quality of the product in the design phases, to reduce or eliminate the costs of fixing problems after ships reach the fleet; (6) develops investment strategies for new concepts and technologies; (7) and supports development of Mission Need Statements (MNS) for future ships.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603563N PROJECT NUMBER: S2196
PROGRAM ELEMENT TITLE: Ship Concept Adv. Design PROJECT TITLE: Design Tools, Plans & Concepts

(U) In FY 1996, Congress added funding for Landing Craft, Air Cushion (LCAC) Service Life Extension Program, to this PE/Project, for advance planning and engineering efforts. Modifications are to be incorporated into craft 91 in production.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS:

- (U) ($911) Integrated new technologies in total ship concepts. Developed ship concepts for potential ships 5-10 years out in the SCN plan, including ship size, configuration, capabilities and rough order of magnitude (ROM) ship costs. Conducted pre-Milestone 0 ship concept studies for combat logistics force, amphibious assault, mine countermeasure support, and future surface combatant ships. Analyzed the cost/benefit of new concepts and technologies. Developed R&D investment strategies which provide cost/benefit comparisons for new concepts and technologies.

- (U) ($2,520) Continued development and improvement of design methods, criteria, standards and data bases. Continued improvements to auxiliary/amphibious assault ship and surface combat ship synthesis and assessment models. Added capability to address increased capabilities to determine ship size impacts of new technologies. Included the lessons learned from ship modularity, production, and commonality of H,M&E systems studies done in previous FYs. Continued improvements to ship performance based cost estimating models. Continued supporting development of advanced computer aided design methods and tools for early stage ship design, including simulation based design techniques. Identified, characterized and assessed new and emergent technologies and updated the HM&E technology database.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603563N PROJECT NUMBER: S2196
PROGRAM ELEMENT TITLE: Ship Concept Adv. Design PROJECT TITLE: Design Tools, Plans & Concepts

- (U) ($2,526) Continued development of reliability based structural design methods/criteria including predicting seaway hydrodynamic loads, testing of grillage and stiffener strength, fatigue specimens and slamming strength models. Began development of reliability analysis method for surface ships. Continued long-term ship structural response measurements on USS MONTEREY (CG 61) and USS WASP (LHD 1). Conducted short term rough water full scale trials on the LHD 1. Analyzed data from the seaway loads model tests on LHD 1. Completed seaway loads model testing on the Canadian patrol frigate model. Supported Ship Structure Committee (SSC) research work. Continued to assess emerging class problems and support new ship designs with new technologies/tools as a means of "benchmarking" these new design methods/criteria.

- (U) ($3,316) Developed the Electromagnetic (EM) Engineering (ENG) models toward Baseline II. Formalized mature software modules for an interim Baseline I+ release in FY 96. Expanded and began integration of a transition frequency analysis tool into the EMENG architecture. Expanded the microwave EM environment predictive techniques to provide a total ship volumetric EM data set. Resumed electro-optics and millimeter wave analytical capabilities development. Brought on line a scientific visualized package to assist in data interpretation, data culling and inference and trend analysis. Began the expansion of high frequency (HF) analytics to predict scaled "brass model" parameters. Continued open system architecture design and assessed the possible converging to a parallel processing environment. Developed requirements for the integration of frequency and time domain tools. Brought on line a prototype expert system (rule based) below decks predictive (magnetic field, cable coupling) capability integrated into the EM Engineering architecture. Developed requirements for EMENG updates to address non-metallic materials (composites, frequency selective surfaces). Developed on-line access to lessons learned databases, design guidelines and other user aiding techniques.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603563N PROJECT NUMBER: S2196
PROGRAM ELEMENT TITLE: Ship Concept Adv. Design PROJECT TITLE: Design Tools, Plans & Concepts

- (U) ($19,211) Continued to develop prototype common modules to demonstrate design, fabrication, shipbuilding process and operational utility. Completed RO unit and Navy standard fire pump modules. Built prototype modules identified as building blocks during FY 94 work, including crew sanitary space module. Installed a prototype officer's sanitary space aboard a DD 963 class ship. This installation used the modular panels from the officer and crew sanitary space modules. Examined commercial technologies to provide more affordable shipboard lighting in spaces. Started development of module/common concepts for future Naval ship food service (galley) spaces. Where possible utilized commercial food service equipment and technologies including those used aboard commercial ships such as ferries and cruise ships. Evaluated commercial technologies for modular track/hold down systems for use in mounting standardized and modular equipment aboard ships in C4I and other types of spaces. Started building prototypes to demonstrate these track hold down systems. Began engineering analysis and test fixture construction in preparation for evaluation and testing of a modular 5 inch gun system in conjunction with DoD Foreign Comparative Test (FCT) program. Continued development of alternative heating, ventilation, and cooling (HVAC) zonal distributed system architectures. Developed ventilation, chilled water and other module concept designs to support alternative HVAC architecture. Began development of specifications and standards for the common modules/standard interfaces. Continued work to identify areas/methods of commonality among ships to improve affordability and producibility. Continued development of the requirements and systems engineering including logistics support methods to achieve more cost effective equipment standardization for Naval ships. Continued to identify/develop the family of modules which will be the building blocks for future navy surface ships, including configuration control requirements. Assessed the cost/benefit trade-offs of associated commonality. Assess the return on investment associated with development of each of these modules. Complete development of one prototype product-oriented design and construction (PODAC) cost model using as a basis activity based costing methods from other similar industries. Identified several other existing cost tools for use as a PODAC cost model. Began evaluation of these alternative cost models. Continued to collect and analyze ship construction activity cost data for use with the PODAC cost model. Continued development of generic and engineered build strategies for naval ships that foster product oriented ship construction processes and incorporate alternative distributed ship systems architectures and modules. Continued to identify changes to naval ship configurations, ship systems, and equipment designs to enable the use of commercial shipbuilding processes for the construction of future naval ships. Increased FY 1995 funding provided investment in future affordable ship architectures and early development of prototype modules to demonstrate design, fabrication, shipbuilding process, and operational utility. Efforts were focused on application of and implementation of commonality to LPD 17 design.

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FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603563N PROJECT NUMBER: S2196
PROGRAM ELEMENT TITLE: Ship Concept Adv. Design PROJECT TITLE: Design Tools, Plans & Concepts

2. (U) FY 1996 PLAN:

- (U) ($711) Integrate new technologies in total ship concepts. Develop ship concepts for potential ships 5-10 years out in the SCN plan, including ship size, configuration, capabilities and rough order of magnitude (ROM) ship costs. Conduct pre-Milestone 0 ship concept studies for combat logistics force, amphibious, mine countermeasure support, and future surface combatant ships. Analyze the cost/benefit of new concepts and technologies. Develop R&D investment strategies which provide cost/benefit comparisons for new concepts and technologies.

- (U) ($1,603) Continue development and improvement of design methods, criteria, standards and data bases. Continue improvements to auxiliary/amphibious assault ship and surface combatant ship synthesis and assessment models. Add capability to address minimum required shipboard manning, reduced construction cost, and increased capabilities to determine ship size impacts of new technologies. Include the lessons learned from ship modularity, production, and commonality of H,M&E systems studies done in previous FYs. Continue improvements to ship cost estimating models. Continue supporting development of advanced computer aided design methods and tools for early stage ship design, including simulation based design techniques. Identify, characterize and assess new and emergent technologies and update the HM&E technology database.

- (U) ($1,556) Continue obtaining long-term data collection of full-scale seaway hydrodynamic loads. Initiate development of slam pressure algorithms and associated strength considerations. Finalize stiffener strength variable and distribution development to augment reliability assessments. Continue component fatigue strength evaluations and initiate fracture toughness assessment formulation. Begin validation studies of analytical based loads predictions. Finalize ship fabrication and material strength variable definition and development of probability distributions. Complete stiffener local instability tests. Support SSC Research.

- (U) ($1,714) Develop additional elements of the EM Engineering Baseline II system. Release EM Engineering interim Baseline I+. Complete microwave EM environment predictive techniques, and continue transition frequency prediction development. Develop and install modules to address composite and frequency selective surfaces. Continue Baseline II electro-optics and millimeter wave analysis development. Bring on-line a prototype Baseline II high frequency (HF) EM environment workstation that operates in parallel with scaled "brass model" tests. Finalize the architectural design for the Baseline II version of the EM Engineering system.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603563N PROJECT NUMBER: S2196
PROGRAM ELEMENT TITLE: Ship Concept Adv. Design PROJECT TITLE: Design Tools, Plans & Concepts

- (U) ($10,279) Continue to identify and develop areas/methods for increased commonality for naval ships and ship systems to improved life cycle affordability. Continue development of common ship architectures for hull, mechanical and electrical (HM&E) systems, and related command, control, communications, computers and information (C4I) systems, and combat systems (C/S) as well as development of associated common module prototypes and designs to demonstrate more cost-effective design, fabrication, shipbuilding processes and operational utility. Emphasis will be on development of ship configurations and systems architectures that can utilize commercial processes and/or commercial-off-the-shelf (COTS) equipment and materials. Develop total ship concepts for modular surface combat ships and combat logistics support ships. Continue development of common berthing modules, damage control locker modules, food service (galley) module, rolling airframe missile (RAM) modules, and radio communication system equipment modules. Continue development of module concepts identified as architectural building blocks efforts, including ship auxiliary system modules, and ship self defense combat systems modules. Shock test the modular 5-inch gun system in conjunction with DoD Foreign Comparative Test (FCT) program. Continue work on modular track/hold down systems and in compartment support systems (i.e. modular electrical connections) for use in mounting standardized and modular equipment aboard ships in C4I and other types of spaces to reduce the future costs of ship equipment/ system modernization. Supported prototype installations on fleet ships to demonstrate these track hold down systems and common/standard foundation connections. Continue development of specifications and standards for implementing use of common modules, standard components and standard interfaces. Continue development and definition of common module standard interfaces. Continue efforts on more cost effective methods and practices to standardize shipboard equipment for life cycle cost savings. Complete first phase of engineering efforts on across program / fleet common equipment. Complete systems engineering analysis (including cost analysis) to identify/develop the families of modules as the building blocks of the future surface Navy, including configuration control requirements. Continue development of alternative distributed systems architectures for HVAC, air systems and fluid transfer systems that foster improved ship production and total life cycle ship affordability. Complete the first phase of development for the PODAC cost model using a Navy / shipbuilder team. Continue development of generic and engineered build strategies for naval ships that foster product-oriented ship design and construction, and incorporate common system architectures and modules. Complete module and equipment standardization efforts for inclusion into the final LPD 17 design package. Efforts are focused on application of commonality to combat logistics force (CLF) ships, the 21st century surface combatant (SC 21), and other ships in the SCN plan.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603563N PROJECT NUMBER: S2196
PROGRAM ELEMENT TITLE: Ship Concept Adv. Design PROJECT TITLE: Design Tools, Plans & Concepts

- (U) ($35,149) Initiate engineering of SLEP improvements and initiate Integrated Logistics planning. Initiate engineering for engine upgrades and qualification testing. Modify delivered craft for testing. Develop the Engineering Change Proposal (ECP) for incorporation of modifications on the last craft during production. Technical support and analysis. Craft operations and test support.

- (U) ($1,032) Portion of extramural program reserved for Small Business Innovative Research assessment in accordance with 15 U.S.C.638.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603563N PROJECT NUMBER: S2196
PROGRAM ELEMENT TITLE: Ship Concept Adv. Design PROJECT TITLE: Design Tools, Plans & Concepts

3. (U) FY 1997 PLAN:

- (U) ($639) Integrate new technologies in total ship concepts. Develop ship concepts for potential ships 5-10 years out in the SCN plan, including ship size, configuration, capabilities and rough order of magnitude (ROM) ship costs. Conduct pre-Milestone 0 ship concept studies for combat logistics force, amphibious, mine countermeasure support, and future surface combatant ships. Analyze the cost/benefit of new concepts and technologies. Develop R&D investment strategies which provide cost/benefit comparisons for new concepts and technologies.

- (U) ($1,470) Continue development and improvement of design methods, criteria, standards and data bases. Continue improvements to auxiliary/amphibious assault ship and surface combatant ship synthesis and assessment models. Add capability to address minimum required shipboard manning, reduced construction cost, and increased capabilities to determine ship size impacts of new technologies. Include the lessons learned from ship modularity, production, and commonality of HM&E systems studies done in previous FYs. Continue improvements to ship cost estimating models. Continue supporting development of advanced computer aided design methods and tools for early stage ship design. Identify, characterize and assess new and emergent technologies and update the HM&E technology database.

- (U) ($230) Conduct initial hands-on evaluation of state-of-the-art visualization and simulation techniques for application to ship design and engineering. Accomplish initial exploratory application of techniques having multi-disciplinary applicability.

- (U) ($1,172) Continue collection of long-term hydrodynamic loads data and update algorithms for longitudinal and transverse bending as well as torsion loads. Continue grillage strength tests and assessments developing ultimate strength relationships. Complete fracture assessment formulation. Update reliability inputs and assessment techniques; continue validation of processes and utilize technologies/improved design methods on existing ships. Support SSC Research.

- (U) ($483) Support user base in execution of EM Engineering interim Baseline I+ installations and integration. Develop integration plan for EM Engineering Baseline II evolution into the Surface Ship Integrated Topside Design Project.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603563N PROJECT NUMBER: S2196
PROGRAM ELEMENT TITLE: Ship Concept Adv. Design PROJECT TITLE: Design Tools, Plans & Concepts

- (U) ($9,813) Continue to identify and develop areas/methods for increased commonality for naval ships and ship systems to improved life cycle affordability. Continue development of common ship architectures for HM&E systems, related C4I systems, and combat systems including interface standards for modular ship systems. Continue development of ship configurations and systems architectures that can utilize commercial processes and/or commercial-off-the-shelf (COTS) equipment and materials. Continue development of total ship concepts for modular surface combat ships and combat logistics support ships. Continue development of food service (galley) module(s), ventilation and chilled water HVAC modules, ship auxiliary systems, and various ship's self defense system modules. Commence development of concept level designs and requirements for modules identified as architectural building blocks, including combat systems modules and shipboard auxiliary system modules. Continue to develop maintain specifications and standards for implementing use of common modules, standard components and standard interfaces including use of commercial standards. Continue efforts on more cost effective methods and practices to standardize shipboard equipment for life cycle cost savings. Continue developmental and testing work on modular track/hold down systems and in compartment support systems (i.e. modular electrical connections) for use in mounting standardized and modular equipment aboard ships in C4I and other types of spaces to reduce the future costs of ship equipment/ system modernization. Support SC 21 systems engineering on modularity requirements and flexible mission systems. Validate the prototype PODAC cost model for one type of naval ship. Revise the PODAC cost model based on results of ship production and equipment manufacturing cost data analysis and the validation of the model for naval ship types. Continue development of alternative zonal distributed systems architectures that foster improved ship production and total life cycle ship affordability. With focus on surface combatants continue development of generic and engineered build strategies for naval ships that foster product-oriented ship design and construction, and incorporate common system architectures and modules. Efforts are focused on application of commonality to combat logistics force (CLF) ships, the 21st century surface combatant (SC 21) and other ships in the SCN plan. Primary emphasis is on ship and ship systems modularity for and affordability of the SC 21.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under DEMONSTRATION & VALIDATION because it develops and integrates hardware for experimental test related to specific ship and fleet wide applications.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603563N PROJECT NUMBER: S2196
PROGRAM ELEMENT TITLE: Ship Concept Adv. Design PROJECT TITLE: Design Tools, Plans & Concepts

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996 President's Budget:	28,806	16,736	15,511
(U) Adjustments from PRESBUDG:	-322	+35,308	-1,704
(U) FY 1997 PRESBUDG Submit:	28,484	52,044	13,807

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY 1995 reduction is due to University Research and SBIR adjustments. The net addition of funding in FY 1996 is from: congressional action taken to provide funding for the LCAC SLEP addition of $37M, and congressional undistributed general and inflation reductions. FY 1997 reduction is due to revised inflation estimates and other minor pricing adjustments.
(U) Schedule: EM engineering task efforts will now complete in FY 97.
(U) Technical: Further efforts on improving EM compatibility will be focused on Surface Ship Integrated Topside Design R&D efforts.

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

(U) RELATED RDT&E:
(U) PE 0602121N (Surface Ship Technology)
(U) PE 0603513N (Shipboard System Component Development)
(U) PE 0603514N (Ship Combat Survivability)
(U) PE 0603564N (Ship Preliminary Design and Feasibility Studies)
(U) PE 0604567N (Ship Contract Design/Live Fire T&E)
(U) PE 0603573N (Advanced Surface Machinery Systems)
(U) PE 0605130D (Foreign Comparative Test Program)

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603563N PROJECT NUMBER: S2196
PROGRAM ELEMENT TITLE: Ship Concept Adv. Design PROJECT TITLE: Design Tools, Plans & Concepts

D. (U) SCHEDULE PROFILE:

	FY 1994	FY 1995	FY 1996	FY 1997	TO COMPLETE
Program Milestones	(Not applicable - Non-Acquisition Program)				
Engineering Milestones	Structures (LHD) Model Test Completed 3Q Base/Line I EM ENG 4Q	Structures (Frigate) Model Tests Completed 4Q Crew Sanitary Module Prototype Complete 4Q R.O. Module Complete 4Q Fire Pump Module Complete 3Q Commercial marine Sanitary Modules Evaluations Complete 4Q	LHD 1 Full Scale Trials Analysis Complete 4Q Stateroom Module Level II Design Complete 4Q Prototype PODAC Cost Estimating Model Complete 4Q 13M standard boat tech. design Complete 2Q HVAC Modules Level I Design Complete 3Q	Fracture Tests of Shipyard Fabrication Specimens Complete 4Q Grillage Tests of Shipyard Fabrication Specimens Complete 4Q EMENG Transition Frequency Model Complete 4Q LP Air Module Level I Design 4Q HVAC Module Level Design & Zonal Arch. Definition 4Q HM&E Module Interface Standards Complete 4Q	Zonal HVAC Modules & Distr. Syst. Module Design Handbook

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603563N PROJECT NUMBER: S2196
PROGRAM ELEMENT TITLE: Ship Concept Adv. Design PROJECT TITLE: Design Tools, Plans & Concepts

D. (U) SCHEDULE PROFILE:

	FY 1994	FY 1995	FY 1996	FY 1997	TO COMPLETE
Engineering Milestones (continued)		Prototype Modular Sanitary Space Panel Shipboard Installation 3Q	HM&E Module Interface Standards Industry Review 4Q C4I Modularity Prototype Complete Complete 3Q Modular RAM Install. Design Complete 4Q LCAC SLEP Design Review 4Q	Assessment of Impact of Zonal Distributed Sys. Arch. on Ship Production 4Q Radio Communications Modular Equipment Complete 2Q	Early Stage Design for Production Guidance
Testing Milestones				5 inch Modular Gun System FCT Complete 2Q LCAC SLEP Advanced Skirt Tests 3Q LCAC SLEP Component Tests 2Q	
Contract Milestones	(Not applicable)				

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603563N PROJECT NUMBER: S2196
PROGRAM ELEMENT TITLE: Ship Concept Adv. Design PROJECT TITLE: Design Tools, Plans & Concepts

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

Project Cost Categories	FY 1995	FY 1996	FY 1997
a. Ship Concepts	911	711	639
b. Design Methods/Criteria	2,520	1,603	1,470
c. Simulation Based Design	--	--	230
d. Reliability Based Structures	2,526	1,556	1,172
e. EM Engineering	3,316	1,714	483
f. Affordability Thru Commonality	19,211	10,279	9,813
g. LCAC Service Life Extension			
i. Prime Contract Engr/ILS	--	28,250	--
ii. Government Engineering Support	--	2,401	--
iii. Government Test Support	--	1,678	--
iv. Contractor Test Support	--	1,700	--
v. Program Management Support	--	1,020	--
vi. Travel	--	100	--
h. SBIR		1,032	
Total	28,484	52,044	13,807

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FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603563N PROJECT NUMBER: S2196
PROGRAM ELEMENT TITLE: Ship Concept Adv. Design PROJECT TITLE: Design Tools, Plans & Concepts

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 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Product Development										
Rockwell International Arlington, VA	C/CPAF	11-91	10,367	10,367	6,811	1,996	1,110	450	0	10,367
Advanced Marine Enterprises (AME) Arlington,VA	C/CPFF	2-88	3,789	3,789	1,929	1,860			0	3,789
Advanced Marine Enterprises (AME) Arlington,VA	C/CPFF	4-95	CONT.	CONT.		188	2,345	2,100	CONT.	CONT.
John J. McMullen Assoc. (JJMA) Arlington,VA	C/CPFF	4-95	CONT.	CONT.			1,229	1,100	CONT.	CONT.
NKF Engineering Arlington, VA	C/CPFF	4-86	3,049	3,049	1,849	1,200			0	3,049
Gibbs&Cox, Inc. Arlington, VA & New York, NY (This contract is a team contract supporting the Affordability Thru Commonality Task. Other contract team members are: Advanced Engineering & Research Associates, Arlington, VA; AME, Arlington, VA; Avondale Industries, New Orleans, LA; Bath Irons Works, Bath, ME; Dayton T. Brown, Islip, NY; Hopeman Brothers, Waynesboro, VA; Ingalls Shipbuilding, Pascagoula, MS; M. Rosenblatt & Son, Arlington, VA; NKF Engin., Arlington, VA; PDI Corp., Annapolis, MD; Thomas Enterprises, Alexandria, VA; United Defense LP (FMC), Minneapolis, MN; and LORAL Corp., Arlington, VA.)	C/CPFF	9-94	CONT.	CONT.	90	8,411	2,240	2,000	CONT.	CONT.
Textron Marine and Land Systems New Orleans, LA	TBD	TBD	28,250	28,250	0	0	28,250	0	0	28,250

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603563N
PROGRAM ELEMENT TITLE: Ship Concept Adv. Design

PROJECT NUMBER: S2196
PROJECT TITLE: Design Tools, Plans & Concepts

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Other Contractors		Various	CONT.	CONT.		4,785	4,432	2,757	CONT.	CONT.
NSWC/Carderock Div.	WR	Various	CONT.	CONT.		7,037	4,039	4,000	CONT.	CONT.
Other. Gov.	WR	Various	CONT.	CONT.		3,007	1,500	1,400	CONT.	CONT.
Support and Management										
Various Gov.	WR	Various	4,179	4,179	0	0	4,179	0	0	4,179
Various Contractors		Various	1,020	1,020	0	0	1,020	0	0	1,020
Test and Evaluation										
Resource Consultant, Inc. Vienna, VA	CPAF	05/96	1,700	1,700	0	0	1,700	0	0	1,700

GOVERNMENT FURNISHED PROPERTY - Not applicable.

	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Subtotal Product Development	28,484	45,145	13,807	CONT.	CONT.
Subtotal Support and Management	0	5,199	0	0	5,199
Subtotal Test and Evaluation	0	1,700	0	0	1,700
Total Project	28,484	52,044	13,807	CONT.	CONT.

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FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT:0603564N
PROGRAM ELEMENT TITLE: Ship Preliminary Design and Feasibility Studies

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
S0408	Ship Development (Advanced)								
	6,796	9,210	12,942	5,422	6,618	9,129	1,317	CONT.	CONT.
S2087	Strategic Sealift Technology Development Program								
	18,790	0	0	0	0	0	0	-0-	18,790
F2200	New Design SSN								
	4,725	0	0	0	0	0	0	-0-	4,725
TOTAL	30,311	9,210	12,942	5,422	6,618	9,129	1,317	CONT.	CONT.

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The primary objective of Ship Preliminary Design & Feasibility Studies is to design more capable warships at reduced cost, with reduced manning and increased producibility, utilizing the latest technologies. Modern day ship design and acquisition processes do not separate Preliminary and Contract Design. These are seamless design actions conducted between MS I and II. Therefore after FY 1996, design activities formerly conducted in this Program Element (P.E.) as Preliminary Design are combined under P.E. 0604567N, Ship Contract Design/Live Fire Test and Evaluation. After FY 1996, the program will be renamed "Ship Feasibility Studies". This program directly supports the Navy Shipbuilding Plan by performing ship Feasibility Studies and developing Preliminary Designs for new ships in the SCN Plan.

(U) Project S0408 - Ship Development (Advanced), supports post Milestone 0 ship Feasibility Studies that provide the technical definition and initial cost estimates for various ship alternatives being considered in the Cost and Operational Effectiveness Analysis (COEA). This project develops the primary supporting documentation for Milestone I decisions.

(U) Project S2087 - This project supports the development of new concepts and technologies which can be applied to future sealift ships and merchant ships to enhance their operational capability and efficiency, while simultaneously reducing the life cycle cost, particularly acquisition cost, of ships capable of performing the sealift mission.

(U) Project F2200 - This project supports the Preliminary Design development for the New Attack SSN.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT:0603564N
PROGRAM ELEMENT TITLE: Ship Preliminary Design and Feasibility Studies

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under DEMONSTRATION & VALIDATION because it develops and integrates hardware for experimental test related to specific ship or aircraft applications.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT:0603564N
PROGRAM ELEMENT TITLE: Ship Preliminary Design and Feasibility Studies

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
S0408 Ship Development (Advanced)	6,796	9,210	12,942	5,422	6,618	9,129	1,317	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: Ship concepts, identified in PE 0603563N (Ship Concept Advanced Design) are transitioned to and further developed by this project after an approved Milestone 0 (MS 0) decision. This project performs the ship Feasibility Studies required after MS 0 to address a specific Mission Needs Statement (MNS) and supports the Cost and Operational Effectiveness Analysis (COEA) for new surface ships in the Navy Shipbuilding Plan; performs impact studies of warfare, hull, machinery and electrical subsystems on advanced ship designs; develops the initial documentation and the design methodology required by government for the design of surface ships in the Shipbuilding Program in accordance with the requirements of the DoD 5000 directives/instructions; supports the development of the Operational Requirements Document (ORD) and other documentation required at Milestone I; develops and evaluates conventional and unconventional hull form alternatives suitable for future acquisition in support of a Milestone I decision. Completion of this phase allows review and approval, at Milestone I, to transfer a ship program to the Contract Design Program Element 0604567N. Ship Feasibility Study products include a description of the alternative ships' principal characteristics and mission critical subsystems, weight estimates, general arrangement sketches, technical risk assessments, and Class F cost estimates. The objective is to provide the decision makers with feasible, affordable alternatives.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1995

BUDGET ACTIVITY: 4 PROGRAM ELEMENT:0603564N PROJECT NUMBER: S0408
PROGRAM ELEMENT TITLE: Ship Preliminary Design and Feasibility Studies PROJECT TITLE: Ship Development (Advanced)

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS:

- (U) ($6,796) Conducted Ship Feasibility Studies and COEA studies and support ORD preparation for ships in the SCN plan which reach MS 0. Feasibility Studies and COEA support for the Future Surface Combatant (SC-21) began, following MS 0 approval on 01/18/95. $661K forward funds FY 1996 SC-21 efforts. CLF requirements have identified a need for additional ships to transport various cargoes, a MS 0 decision for the ADC(X) is planned for 1st quarter of FY 1996. $1,499K used to forward fund FY 1996 efforts due to poor expenditures.

3. (U) FY 1996 PLAN:

- (U) ($9,074) Conduct Ship Feasibility Studies and COEA studies and support ORD preparation for ships in the SCN plan which reach MS 0. Feasibility Studies for the Future Surface Combatant (SC-21) will continue. $661K of forward funded FY 1995 funds will also support the SC-21 Feasibilty Studies effort. ADC(X) will receive MS 0 approval. ADC(X) Feasibility Studies and COEA support will begin. $1,499K used to forward fund FY 1997 efforts due to poor expenditures.

- (U) ($136) Portion of Extramural Program reserved for Small Business Innovation Research assessment in accordance with 15 U.S.C. 638.

4. (U) FY 1997 PLAN:

- (U) ($12,942) Conduct Ship Feasibility Studies and COEA studies and support ORD preparation for ships in the SCN plan which reach MS 0. Feasibility Studies for the Future Surface Combatant (SC-21) will continue to support a planned FY 98 Milestone I decision. Complete ADC(X) Feasibility Studies and COEA support.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT:0603564N PROJECT NUMBER: S0408
PROGRAM ELEMENT TITLE: Ship Preliminary Design and Feasibility Studies PROJECT TITLE: Ship Development (Advanced)

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996 President's Budget:	7,604	9,708	8,313
(U) Adjustment from President's Budget:	-808	-498	+4,629
(U) FY 1997 PRESBUDG Submit:	6,796	9,210	12,942

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1995 decrease in funding was due to reprogramming of funds as a result of delayed milestone decisions, and general reductions. FY 1996 decrease in funding is due to general Congressional reductions. FY 1997 change includes increases for Ship Design efforts and SC-21 COEA support.

(U) Schedule: Schedules have changed to reflect the latest shipbuilding schedule. Specifically, the MS 0 decision for the Future Surface Combatant (SC-21) occurred 18 January 1995. The CLF MS 0 decision has slipped approximately one year from the planning date used in the preparation of the FY 95 budget. The new Command Ship and the new design Carrier [CV(X)] are beyond the Future Year Defense Program (FYDP).

(U) Technical: Not applicable.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT:0603564N PROJECT NUMBER: S0408
PROGRAM ELEMENT TITLE: Ship Preliminary Design and Feasibility Studies PROJECT TITLE: Ship Development (Advanced)

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

(U) RELATED RDT&E:

(U) PE 0603563N (Ship Concept Advanced Design)
(U) PE 0604567N (Ship Contract Design/Live Fire T&E)
(U) PE 0603508N (Ship Propulsion System)
(U) PE 0603513N (Shipboard Systems Component Development)
(U) PE 0602121N (Surface Ship Technology)
(U) PE 0603573N (Advanced Surface Machinery Systems)

D. (U) SCHEDULE PROFILE: Not applicable.

	FY 1994	FY 1995	FY 1996	FY 1997	TO COMPLETE
Program Milestones	3Q SC-21 JROC	3Q ADC(X) JROC 4Q ADC(X) MS 0 2Q SC-21 MS 0		4Q CV(X) MS 0 2Q ADC(X) MS 1	
Engineering Milestones	TBD - Milestone schedule is established at MS I.				
T&E Milestones	See individual ship acquisition program documentation.				
Contract Milestones	See individual ship acquisition program documentation.				

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT:0603564N PROJECT NUMBER: S0408
PROGRAM ELEMENT TITLE: Ship Preliminary Design and Feasibility Studies PROJECT TITLE: Ship Development (Advanced)

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

Project Cost Categories	FY 1995	FY 1996	FY 1997
a. Ship Design Feasibility Studies	6,766	9,044	12,912
b. Travel	30	30	30
c. Other	0	0	0
d. Travel	0	136	0
Total	6,796	9,210	12,942

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 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Product Development										
Naval Surface Warfare Center Dahlgren	WR	Various	CONT.	CONT.	0	2,028	2,348	3,237	CONT.	CONT.
Other Gov.	WR/Reqn	Various	CONT.	CONT.	1,411	1,135	1,801	2,714	CONT.	CONT.
Applied Physics Laboratory	Competitive	Various	CONT.	CONT.	0	1,720	1,915	2,295	CONT.	CONT.
Other Contractor	Competitive	Various	CONT.	CONT.	1,226	1,913	2,974	4,598	CONT.	CONT.

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT:0603564N
PROGRAM ELEMENT TITLE: Ship Preliminary Design and Feasibility Studies

PROJECT NUMBER: S0408
PROJECT TITLE: Ship Development (Advanced)

Support and Management										
Various	Competitive	Various	CONT.	CONT.	55	0	172	98	CONT.	CONT.

Test and Evaluation: Not applicable.

GOVERNMENT FURNISHED PROPERTY: Not applicable.

	Total FY 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Subtotal Product Development	2,637	6,796	9,038	12,844	CONT.	CONT.
Subtotal Support and Management	55	0	172	98	CONT.	CONT.
Subtotal Test and Evaluation	0	0	0	0	0	0
Total Project	2,692	6,796	9,210	12,942	CONT.	CONT

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603573N
PROGRAM ELEMENT TITLE: Advanced Surface Machinery Programs

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
S1314 Advanced Surface Machinery (ASM) Programs	78,026	80,256	59,773	47,292	49,813	83,737	60,191	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: ASM Programs develop affordable advanced machinery and subsystems for surface ship propulsion, electric and auxiliary requirements. These programs are in various phases of development ranging from concept formulation to full scale development. The goals of the ASM Programs are to: reduce acquisition and operating costs of naval ships; provide military advantages; contribute to American industrial competitiveness; and, lead to environmental compliance. These goals are to be accomplished by leveraging investments in technologies that will be usable by both the military and commercial sectors. Some technologies being developed for military application will have significant commercial viability upon completion of development, while other technologies being developed commercially have significant military applications and will be demonstrated and adapted for military use.

(U) ASM places primary emphasis on a system architecture and a systems engineering approach which maintains flexibility and minimizes investment until technologies are demonstrated, affordability is assessed, trade off decisions are made, and subsystems evaluated and brought together for optimal total ship cost effectiveness. The products of ASM include: Intercooled Recuperated (ICR) Gas Turbine Engine; Standard Monitoring and Control System (SMCS); Zonal Electrical Distribution System (ZEDS); Integrated Power System (IPS); and, Systems Engineering & Modular Architecture.

(U) ICR Gas Turbine Engine. The ICR Gas Turbine Engine is a 26,400 horsepower (with 10% growth margin to 29,040 horsepower) engine designed as a next generation marine gas turbine. ICR will significantly reduce life cycle fuel cost, provide a minimum impact alternative to increase range, and lead to environmental emissions compliance.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603573N PROJECT NUMBER: S1314
PROGRAM ELEMENT TITLE: Advanced Surface Machinery Systems PROJECT TITLE: Advanced Surface Machinery Programs

(U) A contract for ICR Advanced Development (AD) with an option for Full Scale Development was awarded to Westinghouse Electric Corporation in December 1991. The ICR is derived from the Rolls-Royce RB211 aircraft engine and through the introduction of an intercooler, recuperator, and variable area nozzles achieves a 30% propulsion fuel savings when compared to the LM2500. The RB211 is a modern commercial aircraft engine with over 2000 engines delivered to date and production projected well into the next century.

(U) ICR developmental full scale system testing is continuing at Pyestock, England. All major test objectives for the first engine build "A/1" were completed in September 1994. The recuperator was installed at the start of the engine "B/1" testing in December 1994 and the engine operated in excess of 100% power. Tests to date have confirmed engine design predictions and 30% fuel savings benefits of recuperation have been demonstrated. During the running of engine B/1 the recuperator developed air leaks which necessitated its removal and return to the manufacturer. B/1 testing completed without a recuperator. Intensive investigations following the return of the unit revealed both design flaws and manufacturing process problems. A recovery plan is underway involving failure analysis and corrective actions. Resumption of full engine tests began in January 1996 using the B/2 engine with a redesigned recuperator.

(U) Planned Fleet introduction is targeted in FY 01 DDG51 class ships. A Cooperative Agreement between the Royal Navy and US Navy was signed by USD(A&T) on 21 June 94 for in-kind and cash contributions to the ICR program. A Cooperative Agreement between the French and US Navy was signed by ASN(RD&A) on 30 August 95 for in-kind and cash contributions to the ICR program. In Feb 94, the Under Secretary of Defense for Acquisition and Technology, USD(A&T) approved an engine Pre-Planned Product Improvement (P3I) for incorporating engine improvements to the DDG51 class to improve fuel efficiency and ensure environmental compliance. A decision implementing the P3I will be made by ASN(RD&A) in 1997. Other ship classes are being reviewed for possible ICR installation.

(U) Standard Monitoring and Control System (SMCS). The SMCS will integrate the sensing, transmission, interpretation and display of Hull Mechanical and Electrical (HM&E) parameters necessary for machinery control, condition monitoring/ assessment, signature control and damage control management. It is a fully digital, open architecture system based upon

commercial specifications and standards. The system design is consistent with the total ship Integrated Communications and Control (IC^2) architecture while supporting and enhancing the proposed Integrated Condition Assessment System (ICAS) and Damage Control System (DCS).

(U) A contract for SMCS hardware and software necessary for an Advanced Development Model (ADM) was awarded to CAE Link Corporation in Binghamton, New York in May 1993. Initial ship installation is targeted for FY 97 DDG 51. LPD17 class ships are also candidates.

(U) SMCS offers potential to reduce machinery space manning and introduce a standard control system across multiple ship platform classes, taking maximum advantage of open system architecture and industry standards. Based on the results of life cycle cost studies, SMCS is expected to reduce machinery control system procurement costs and total cost of ownership. SMCS provides the architecture necessary to support critical imperatives from the Ship Operational Characteristic Study (SOCS) for embedded readiness assessment, mission planning and training and condition based maintenance. SMCS supports reduced watchstanding through the use of embedded Onboard Training (OBTS). A Logistics Support Analysis is in progress and preliminary studies indicate that seven condition III watchstanders can be eliminated from the DDG-51 Class by replacing the current MCS with SMCS.

(U) SMCS ADM equipment is undergoing testing at the DDG-51 and LSD-41 Hot Plants at NSWC-SSES Phila. All core system hardware to software components have successfully controlled the DDG-51 LBES. Integration of Supplimental Systems (DCS, ICAS) is ongoing. OPTEVFOR will conduct and operational assessment of SMCS in FY-96.

(U) Zonal Electrical Distribution System (ZEDS). The Zonal Electrical Distribution System is a new standard architecture for electrical distribution designed to improve ship producibility and reduce ship acquisition and construction costs. Initial installations of ZEDS incorporated a zonal electrical distribution architecture in order to achieve major enhancements to producibility by reducing the number of watertight compartment penetrations and facilitate testing by ship construction zones. Initial ship installation was FY 94 DDG 51 class ships.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603573N PROJECT NUMBER: S1314
PROGRAM ELEMENT TITLE: Advanced Surface Machinery Systems PROJECT TITLE: Advanced Surface Machinery Programs

(U) Future improvements will address rapid reconfiguration and automated control in response to incipient faults and casualty conditions; fight through capability utilizing SMCS; and changing to DC electrical power (common with submarines). Significant advances in power electronics are expected with broad commercial applications.

(U) Integrated Power System (IPS). The IPS provides complete ship power management by generating power for all load requirements from any combination of prime movers. IPS employs ICR, SMCS, and ZEDS, plus large scale high power density motors, power electronics, and cost saving power distribution architectures. IPS components and technologies are defined through system effectiveness analyses, which include cost and performance factors. IPS addresses ASM Program goals through: reduced ship acquisition cost through integration of propulsion and ship's service prime movers; lower ship operational costs resulting from more flexible operating characteristics and more efficient components; reduced ship construction costs by allowing more extensive modular construction of power generation, distribution, and loads if desired; improved survivability and vulnerability through increased arrangement flexibility; reduced manning through improved monitoring and control systems and reduced on-board maintenance requirements; improved ship signature characteristics if required; improved design flexibility to meet future requirements of multiple ship types or missions; integrating power control and protection by fully utilizing the power electronics in the system to perform fault protection as well as power conversion and load control functions; and, reduced machinery system acquisition costs through utilization of commercially shared technologies and components. The target application for IPS is the twenty-first century surface combatant. Elements of IPS such as solid state power electronics and variable speed drives on auxiliaries will be integrated in near-term ship acquisition targets.

(U) A contract for IPS Full Scale Advanced Development (FSAD) was awarded to Lockheed-Martin (then Martin Marietta) Ocean, Radar and Sensor Systems, Syracuse, New York in February 1995. IPS FSAD incorporates a commercial marine approach to shipboard power generation, propulsion, and electrical power distribution, employing a commercial industrial-derivative generator and propulsion motor, a developmental propulsion power converter and a zonal direct current (DC) ship service electrical distribution system. The focus of the FSAD effort is on system integration, with maximum use of commercial technology adapted as necessary to satisfy military requirements. IPS has the potential to revolutionize the design, construction and operation of U.S. naval ships by using electricity as the primary energy medium aboard ship. IPS reduces

the number of installed prime movers to a minimum, as any power generating unit can supply either propulsion or ship service power to support ship operational priorities at any given time. The flexibility of electric power transmission allows power generating modules of up to 20 megawatts service power converters in whatever arrangement support the ship's mission at lowest overall cost. The ability to independently position the minimum amount of machinery components in small, unmanned modules avoids the need for large engine rooms which in turn will permit greater separation and compartmentation in the ship, with significant benefits in manning, safety and ship survivability over conventional arrangements designs. Additionally, the use of small, unmanned machinery modules will permit the use of non-CFC based fire extinguishing agents (such as CO2) to be installed as integral fire suppression systems similar to those currently used in fleet propulsion gas turbine enclosures.

(U) The IPS architecture will allow the Navy to incorporate developing technologies such as fuel cells, permanent magnet electric machines and pulse power systems into future ship designs as programmed, pre-planned replacements for the first generation of IPS modules, with minimum impact on a more efficient and streamlined ship design and construction process.

(U) Systems Engineering & Modular Architecture. Systems Engineering & Modular Architecture in the ASM Programs are focused on increasing the commonality of components used across ship types and in developing modules which will be integral with standardization, zonal system architectures, and generic shipbuilding strategies. The purpose of increased commonality is to reduce the total cost of ship ownership by using common modules composed of standard components and/or standard interfaces.

(U) ASM modules are being designed to support anticipated ship construction requirements. These modules include Power Generation Modules, Propulsion Motor Modules, Electric Power Transmission/Distribution/Conversion Modules, and Control Modules. Each of these major items consists of numerous sub-modules which, through computer aided design techniques, are integrated as necessary to fulfill unique ship requirements.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under DEMONSTRATION & VALIDATION because it develops and integrates hardware for experimental test related to specific ship or aircraft applications.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603573N PROGRAM ELEMENT TITLE: Advanced Surface Machinery Systems PROJECT NUMBER: S1314 PROJECT TITLE: Advanced Surface Machinery Programs

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS:

- (U) ($ 8,928) SMCS: Completed advanced development model HW\SW Integration and Factory Acceptance Testing (FAT) of the SMCS software and hardware. Conducted SMCS core system operational demonstrations on the DDG51 Gas Turbine Land Based Engineering Site (LBES) and commence installation on the LSD41 Diesel Engine LBES. (Both DDG51 and LSD-41 LBES are located at NSWC Philadelphia.

- (U) ($ 2,922) ZEDS: Completed prototype SSIM testing. Initiated transition of DC ZEDS into IPS. Procured prototype Ship Service Control Modules's (SSCM) for testing. Completed fabrication of RSAD 3 zone test facility. Initiated characterization testing of DC ZEDS and computer simulation utilization. Initiated implementation of Fault Protection algorithm into test facility for verification. Completed ship impact studies of DC ZEDS for characterization of cost drivers and integration with combat system equipment.

- (U) ($ 8,817) IPS: Awarded IPS FSAD contract. Commenced design of FSAD components (generator, propulsion motor, propulsion distribution subsystems, ship service distribution system) and systems integration of IPS conceptual design, architecture, interface specs, and modules. Began identifying requirements analysis for IPS supervisory and zonal control. Completed PM motor testing.

- (U) ($ 1,933) Sys Eng: Performed systems engineering efforts including life cycle costs, producibility studies, manning studies, module development, system integration, architecture design, in support of ASMP efforts.

- (U) ($55,426) ICR: The following also included $41,500K worth of effort in PE 0603508N/S2259: Continued ICR development testing of the full scale engine hardware and software at the Pyestock U.K. Test facility. Alternating builds of the second (B/1) and third (A/2) engine were extensively instrumented for various strainguage, thermal paint and performance tests. Analysis of test results and the stripping inspection of engines were done concurrently with testing another engine. Delivered additional development test hardware needed to maintain the aggressive engine build and test schedule. Continued efforts related to ICR

integrated logistics support and Computer Aided Logistics Support implementation. Conducted Blue Ribbon Panel review/analysis of recuperator failure. Initiated recuperator recovery plan including failure analysis, thermal data unit test, core component tests #1A&C, and bladder test. Implemented design changes and initiated the fabrication of the second recuperator for delivery in FY96. Identified recuperator problem(s), initiated recovery plan, and facilitated preparation of the North American Land-Based Engineering Site at NSWC.

2. (U) FY 1996 PLAN:

- (U) ($25,185) IPS: Continue development of IPS FSAD including the following efforts: complete design and begin fabrication of generator subsystem, propulsion motor and propulsion distribution subsystems; complete design, procure hardware/material, complete drafting and begin manufacture for the Ship Service Invertor Module and IPCC components of the Ship Systems Distribution System; complete design of FSAD software for IPS supervisory Control and Zonal Control and begin to code and test software; conduct FSED System Requirements Review and FSED software spec review; take delivery of SMCS GFE; and, begin design and preparation of IPS FSAD LBES.

- (U) ($46,000) ICR: Continue recuperator recovery plan including the design and build of the developmental recuperators which will enable engine testing with a recuperator to continue. Strip and inspect A/2 engine. Complete Design Review Number 3 (DR3) using redesigned recuperator. DR3 will provide preliminary performance data for the full ICR power range in all modes of operation. Continue ICR system development testing at the Pyestock test facility using B/2, A/3 and B/3 engines, tests include noise and vibration trials, enclosure cooling and ventilation tests, exhaust emissions survey, performance demonstration, strain guage and thermal paint tests. Facilitate preparation of the North American Land-Based Engineering Site at NSWC.

- (U) ($ 5,491) SMCS: Complete LBES testing on DDG51 Hot Plant. Complete installation and conduct LBES testing on LSD-41 Hot Plant. Complete selected MIL qualification tests and report. Initate logistic support development. Complete Operational Assesment with OPTEVFOR.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603573N PROGRAM ELEMENT TITLE: Advanced Surface Machinery Systems PROJECT NUMBER: S1314 PROJECT TITLE: Advanced Surface Machinery Programs

- (U) ($ 2,092) Systems Engineering: Perform systems engineering efforts including life cycle costs, producibility studies, manning studies, module development, systems integration, architecture design. in support of ASMP efforts.

- (U) ($ 1,488) Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15 U.S.C. 638.

3. (U) FY 1997 PLAN:

- (U) ($ 900) SMCS: Complete SMCS core system. Enhance core system for adaptation with IPS and interface/integration with other shipboard control systems. Continue logistic support development. Fleet introduce SMCS on appropriate ship classes.

- (U) ($34,100) ICR: Complete the first 500hr endurance test using A/4 engine. Complete cyclic endurance test of the final design recuperator core. Complete design of the EDM recuperator. Commence fabrication of EDM recuperator.

- (U) ($23,113) IPS: Continue development of IPS including: complete generator subsystem, propulsion motor, and propulsion distribution subsystems fabrication and factory acceptance testing (FAT); take delivery of generator, propulsion motor, and propulsion distribution subsystems; complete manufacture and test of Ship Service Distribution System (SSDS); take delivery of SSDS; complete IPS supervisory control and zonal control code and test; complete IPS FSED design review 1; complete FSED SIM/STIM; and, continue FSAD LBES site preparation and equipment delivery.

- (U) ($ 1,660) Systems Engineering: Perform systems engineering efforts including life cycle costs, producibility studies, manning studies, module development, systems integration, architecture design in support of ASMP efforts.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603573N PROGRAM ELEMENT TITLE: Advanced Surface Machinery Systems PROJECT NUMBER: S1314 PROJECT TITLE: Advanced Surface Machinery Programs

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996 President's Budget:	37,950	39,156	34,699
(U) Adjustments from PRESBUDG:	+40,076	+41,100	+25,074
(U) FY 1997 PRESBUDG Submit:	78,026	80,256	59,773

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1997 increase is due to a transfer of ICR Engine from PE 0603508N/S2259. FY 1995 & FY 1996 increases are due to a transfer of ICR Engine from PE 0603508N/S2259, as well as funding increases ($7.4M and $18.1M, respectively) for the ICR engine.

(U) Schedule: Due to recuperator redesign and impact on testing schedule, ICR fleet introduction on DDG51 shifts one year to right from FY00 to FY01. Pilot ship installation has been deleted.

(U) Technical: The scope of the program is being adjusted in order to delete from the current ICR program: ship integration testing at LBES; USN Logistics Support Analysis and documentation, and the quantity of engines being procured.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

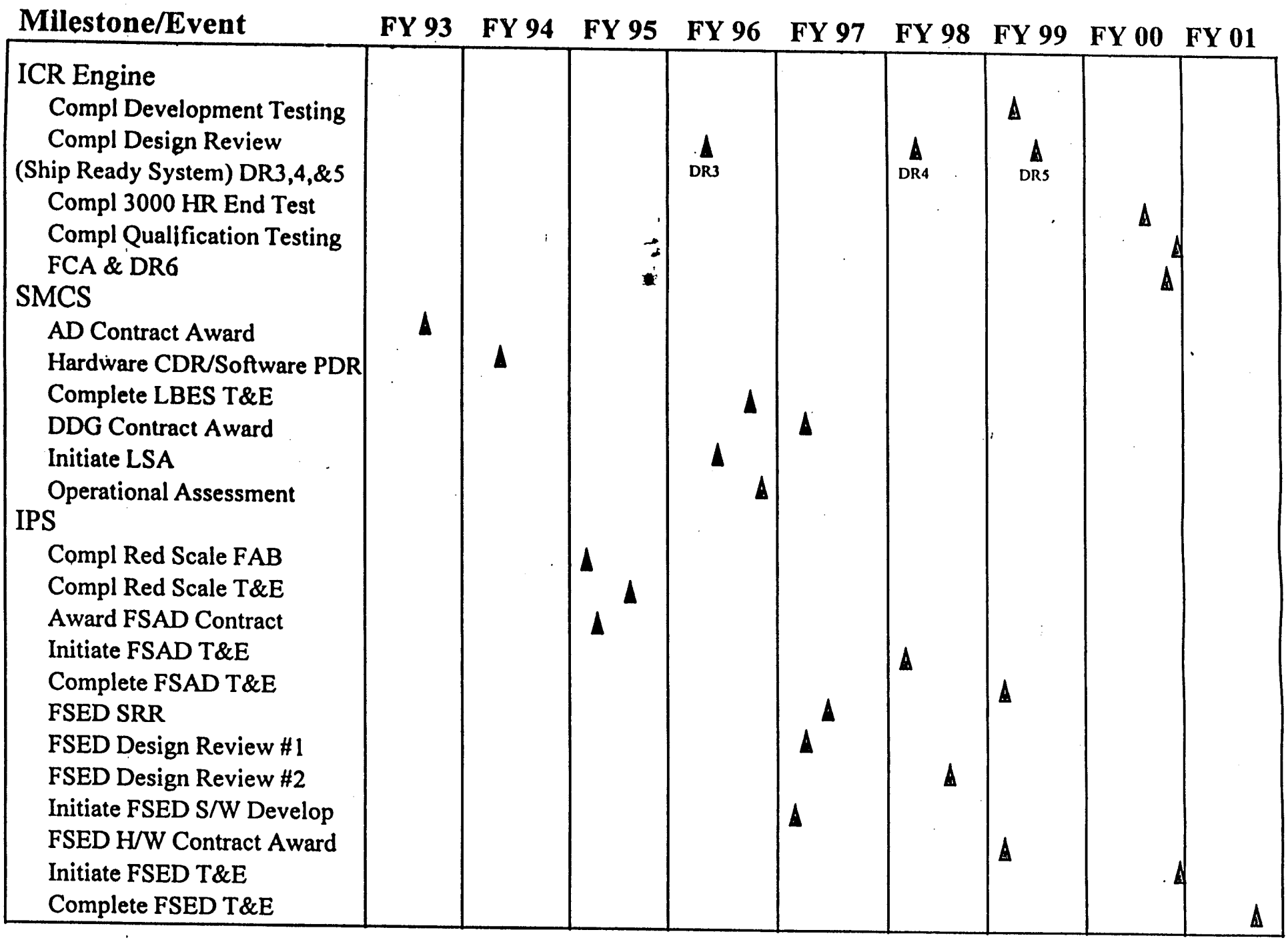
BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603573N PROJECT NUMBER: S1314
PROGRAM ELEMENT TITLE: Advanced Surface Machinery Systems PROJECT TITLE: Advanced Surface Machinery Programs

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

	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
(U) SCN Line - TBD	0	0	0	0	0	00	64,000	TBD	TBD

(U) RELATED RDT&E:
(U) PE 0602121N (Surface Ship Technology)
(U) PE 0603721N(Environmental Protection)
(U) PE 0603508N (Ship Propulsion System)

D. (U) SCHEDULE PROFILE: See Attached


Milestone/Event
FY 93
FY 94
FY 95
FY 96
FY 97
FY 98
FY 99
FY 00
FY 01
ICR Engine
Compl Development Testing
Compl Design Review
(Ship Ready System) DR3,4,&5
Compl 3000 HR End Test
Compl Qualification Testing
FCA & DR6
SMCS
AD Contract Award
Hardware CDR/Software PDR
Complete LBES T&E
DDG Contract Award
Initiate LSA
Operational Assessment
IPS
Compl Red Scale FAB
Compl Red Scale T&E
Award FSAD Contract
Initiate FSAD T&E
Complete FSAD T&E
FSED SRR
FSED Design Review #1
FSED Design Review #2
Initiate FSED S/W Develop
FSED H/W Contract Award
Initiate FSED T&E
Complete FSED T&E
DR3
DR4
DR5

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603573N
PROGRAM ELEMENT TITLE: Advanced Surface Machinery Systems
PROJECT NUMBER: S1314
PROJECT TITLE: Advanced Surface Machinery Programs

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

Project Cost Categories	FY 1995	FY 1996	FY 1997
a. PRIMARY HARDWARE DEVELOPMENT	70,490	73,196	54,173
b. SYSTEMS ENGINEERING	2,500	1,750	1,745
c. DEVELOPMENTAL T&E	4,936	3,722	3,755
d. TRAVEL	100	100	100
e. SBIR	0	1,488	0
Total	78,026	80,256	59,773

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 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Product Development										
N0002492C4166 WESTINGHOUSE ELECTRIC CORPORATION, SUNNYVALE CA (ICR)	C/CPAF	12/91	*TBD	*TBD	140,717	52,016	43,358	33,100	*TBD	*TBD

* Contractor is preparing proposal per request of Program Office.

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603573N PROGRAM ELEMENT TITLE: Advanced Surface Machinery Systems PROJECT NUMBER: S1314 PROJECT TITLE: Advanced Surface Machinery Programs

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
N0002492C4207 NEWPORT NEWS SHIPBUILDING, NEWPORT NEWS VA (IPS RSAD)	SS/CPFF	5/92	8,319	8,319	7,869	450	0	0	0	8,319
N0002493C4010 CAE-LINK, BINGHAMTON NY (SMCS)	C/CPAF	5/95	26,032	26,032	16,391	7,041	3,500	600	0	26,032
TBD (CONTROLS BL3)	C/CPAF	2Q/97	TBD	TBD	0	0	0	1,000	TBD	TBD
N0002495C4109 LOCKHEED MARTIN, SYRACUSE NY (INTEGRATED POWER SYSTEMS FSAD)	C/CPAF	2/95	TBD	TBD	0	6,475	18,200	16,138	TBD	TBD
TBD (PM MOTORS)	C/CPAF	1Q/96	TBD	TBD	0	0	2,400	0	TBD	TBD
TBD (INTEGRATED POWER SYSTEMS (IPS FSED))	C/CPAF	1Q/99	TBD	TBD	0	0	0	0	TBD	TBD
NAVSURFWARCEN ANNAPOLIS MD	WR	1Q/95	CONT.	CONT.	31,371	5,097	3,613	3,329	CONT.	CONT.
SMALL BUSINESS INNOVATION RESEARCH IAW 15 U.S.C. 638						0	1,488	0		
Misc Contracts (less than $1M) Total:					16,710	3,738	2,677	1,781	CONT.	CONT.

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603573N PROJECT NUMBER: S1314
PROGRAM ELEMENT TITLE: Advanced Surface Machinery Systems PROJECT TITLE: Advanced Surface Machinery Programs

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 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Misc Gov't Activities(less than $1M) Total:					1,010	154	153	100	CONT.	CONT.
Total Product Development:					214,068	74,970	75,389	56,048	CONT.	CONT.
Support and Management: Not applicable.										
Test and Evaluation:										
NAVSURFWARCEN SHIPSYSENGSTA PHILADELPHIA PA	WR	1Q/95	CONT.	CONT.	13,735	3,056	3,367	3,725	CONT.	CONT.

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603573N PROGRAM ELEMENT TITLE: Advanced Surface Machinery Systems PROJECT NUMBER: S1314 PROJECT TITLE: Advanced Surface Machinery Programs

GOVERNMENT FURNISHED PROPERTY:

Item Description	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Delivery Date	Total FY 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Product Development									
IPS CONTROL SYSTEM		1Q/96	3Q/96	0	0	1,500	0	0	1,500
		LOCKHEED MARTIN							

Support and Management: Not applicable.

Test and Evaluation: Not applicable.

	Total FY 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Subtotal Product Development	214,068	74,970	76,889	56,048	CONT.	CONT.
Subtotal Support and Management	0	0	0	0	0	0
Subtotal Test and Evaluation	13,735	3,056	3,367	3,725	CONT.	CONT.
Total Project	227,803	78,026	80,256	59,773	CONT.	CONT.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603582N
PROGRAM ELEMENT TITLE: Combat System Integration

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
S0164 Combat System Integration	9,298	5,246	3,879	5,961	7,455	7,508	7,737	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project provides shore based testing of integrated combat direction, weapon, sensor and computing systems prior to their installation in operational fleet units. The operational computer programs are assembled and tested to assure proper configuration and interoperability in a test environment similar to their ultimate shipboard operational environment. Included is operational assessment testing of the integrated suite of computer programs. This is the only opportunity for this range of testing of individually developed and tested combat system subsystem programs prior to shipboard delivery for operational use. Combat system level configuration control is maintained by updates to the Surface Ship Combat System Master Plan (SSCSMP).

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS:

- (U) ($7,175) Conducted integration testing of: Advanced Combat Direction System (ACDS) Block 1 in CV/CVN classes and ACDS Block 0 improvements in CV/CVN and LHD 1 classes. Conducted operational assessments of combat system improvements in New Threat Upgrade (NTU) classes. Conducted evaluation testing of the Dual Net Multiple Frequency Link subsystem.

- (U) ($1,668) Continued planning and preparations for out-year testing including simulation system, test bed and test procedures design and development.

- (U) ($455) Continued SSCSMP updates.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603582N PROJECT NUMBER: S0164
PROGRAM ELEMENT TITLE: Combat System Integration PROJECT TITLE: Combat System Integration

2. (U) FY 1996 PLAN:

- (U) ($3,914) Conduct integration testing of: Advanced Combat Direction System (ACDS) Block 1; ACDS Block 0 improvements and Cooperative Engagement Capability for CV/CVN and LHD 1 classes; AN/SQQ-89 Surface Warfare System upgrades, Rolling Airframe Missile System and Rapid Anti-Ship Missile Integrated Defense System in DD 963 class; and, Command Direction System upgrades in FFG 7 Class.
- (U) ($995) Continue planning and preparations for out-year testing including simulation system, test bed and test procedures design and development.
- (U) ($275) Continue SSCSMP updates.
- (U) ($62) Portion of extramural program reserved for Small Business Innovative Research assessment in accordance with 15 U.S.C.638.

3. (U) FY 1997 PLAN:

- (U) ($2,905) Conduct integration testing of: Advanced Combat Direction System (ACDS) Block 1 upgrades and Shipboard Self Defense System in CV/CVN and LHD 1 classes.
- (U) ($762) Initiate design of test beds for CVN 68, CVN 76 and LPD 17 classes. Continue planning and preparations for out-year testing including simulation system, test bed and test procedures design and development.
- (U) ($212) Continue SSCSMP updates.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under DEMONSTRATION & VALIDATION because it develops and integrates hardware for experimental test related to specific ship or aircraft applications.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603582N PROGRAM ELEMENT TITLE: Combat System Integration PROJECT NUMBER: S0164 PROJECT TITLE: Combat System Integration

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996 President's Budget:	7,380	5,414	7,180
(U) Adjustments from PRESBUDG:	+1,918	-168	-3,301
(U) FY 1997 PRESBUDG Submit:	9,298	5,246	3,879

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: Increase of 1,918K in FY 1995 to support testing of the Dual Net Multiple Frequency Link Subsystem. FY 1996 decreased due to Congressional undistributed general and inflation reductions; and revised DoD inflation rates and other minor pricing adjustments. FY 1997 decreased due to program restructure, revised inflation estimates and other minor pricing adjustments.

(U) Schedule: The Dual Net Multiple Frequency Link Subsystem was added to the test schedule in FY 1995. Portions of the FY 1997 scheduled Advanced Combat Direction System (ACDS) Block 1 testing are shifted into FY 1998. The scope of other scheduled tests will be reduced to meet minimum program delivery requirements. FY 1997 scheduled testing for the FFG 7 and the LHA 7 classes are cancelled.

(U) Technical: No changes.

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

(U) RELATED RDT&E: Computer programs developed under these programs are tested in their integrated configuration:

(U) PE 0204571N (Consolidated Training Systems Development)
(U) PE 0205620N (Surface ASW Combat Systems Integration)
(U) PE 0603382N (Advanced Combat System Technology)
(U) PE 0603755N (Ship Self Defense)
(U) PE 0604301N (MK 92 Fire Control System Upgrade)
(U) PE 0604372N (New Threat Upgrade)
(U) PE 0604518N (CIC Conversion)
(U) PE 0604755N (Ship Self Defense)

D. (U) SCHEDULE PROFILE: Not applicable.

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FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603609N
PROGRAM ELEMENT TITLE: Conventional Munitions

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
S0363 Insensitive Munitions Advanced Development	12,430	7,628	7,306	12,578	15,586	15,822	16,326	CONT.	CONT.
U1821 Conventional Fuze/Warhead Package	27,077	26,701	19,184	18,803	20,624	19,602	19,553	CONT.	CONT.
TOTAL	39,507	34,329	26,490	31,381	36,210	35,424	35,879	CONT.	CONT.

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:
INSENSITIVE MUNITIONS ADVANCED DEVELOPMENT (IMAD) (Project S0363): Most Navy munitions react violently when exposed to unplanned stimuli such as fire, shock and bullet impact, thus presenting a great hazard to ships, aircraft, and personnel. This IMAD program will provide, validate and transition technology for explosives, propellants and ordnance to enable production of munitions insensitive to unplanned stimuli with no reduction to combat performance.

CONVENTIONAL FUZE/WARHEAD PACKAGE (Project U1821): The Navy requires improved lethality of air and surface launched ordnance to defeat advanced threats. Current specific requirements and initiatives to address them include: the ability to defeat anti-ship missiles attacking at extremely low altitudes by improving SPARROW Missile through the Missile Homing Improvement Program (MHIP) to counter deceptive countermeasures; demonstrate advance missile fuzing systems to defeat extremely low-altitude and low observable targets with the Advance Threat Fuze; develop advanced integrated guidance/fuzing and warhead mass-focusing systems to increase lethality against current and emerging threats. This project will, in future years, also provide the vehicle to address emergent requirements by transitioning mature fuze and warhead technology from conceptual developments to engineering development with minimum technical and financial risk.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under DEMONSTRATION & VALIDATION because it develops and integrates hardware for experimental test related to specific ship or aircraft applications.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603609N
PROGRAM ELEMENT TITLE: Conventional Munitions

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
S0363 Insensitive Munitions Advanced Development	12,430	7,628	7,306	12,578	15,586	15,822	16,326	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:
Most Navy munitions react violently when exposed to unplanned stimuli such as fire, shock and bullet impact, thus presenting a great hazard to ships, aircraft and personnel. This program will provide, validate and transition technology to all new weapon developments and priority weapon systems and enable production of munitions insensitive to these stimuli with no reduction in combat performance. The Insensitive Munitions (IM) Advanced Development Program is the Navy's focused effort on propellants, propulsion units, explosives, warheads, fuzes and pyrotechnics to reduce the severity of cook-off and bullet/fragment impact reactions, minimizing the probability for sympathetic detonation, both in normal storage and in use, increasing ship survivability and satisfying performance and readiness requirements. Each technology area is divided into subtasks addressing specific munition/munition class IM deficiencies. Energetic materials producibility is demonstrated to assure national capability to produce and load munitions systems. The program is being closely coordinated with other Military Departments, NATO and allied countries to eliminate redundant efforts and maximize efficiency. A joint service IM requirement has been developed. Insensitive munitions are identified as a DoD critical technology requirement.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS:

- (U) ($884) Validated and analyzed weapon systems POA&Ms for IM compliance. Analyzed the availability of critical chemicals.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603609N PROJECT NUMBER: S0363
PROGRAM ELEMENT TITLE: Conventional Munitions PROJECT TITLE: IM Advanced Development

- (U) ($3,861) Developed high explosives which showed improved IM characteristics while maintaining or improving operational performance. Qualified melt-cast general purpose explosive and evaluated performance characteristics such as long term aging. Initiated qualification, scale-up, performance and vulnerability testing of a castable CL-20 based explosive. Conducted large scale generic performance and vulnerability testing of improved underwater explosives.

- (U) ($2,425) Evaluated IM ordnance concepts. Conducted system demonstrations of new high explosives combined with improved warhead and booster designs to support technology transitions. Continued development, improvement and application of modeling and data bases which reduce and enhance IM warhead design and test efforts.

- (U) ($5,260) Developed IM propellants and propulsion systems which provided improved or comparable performance to in-service systems and better IM characteristics. Combined candidate IM propellants and case concepts to demonstrate compliance with IM and performance requirements. Evaluated concepts applicable to advanced air-to-air, shoulder launched and air-to-ground systems. Continued demonstration and evaluation of prototype IM dual thrust rocket motor for surface missile systems.

2. (U) FY 1996 PLAN:

- (U) ($590) Continue validation and analysis of weapon systems POA&Ms for IM compliance. Analyze the availability of critical chemicals.

- (U) ($2,711) Demonstrate high explosives which show improved IM characteristics while maintaining or improving operational performance. Complete scale-up, performance and vulnerability testing of a castable CL-20 based explosives and qualify if warranted. Complete qualification of improved underwater explosives.

- (U) ($1,249) Continue evaluation of IM ordnance concepts. Conduct system demonstrations of new high explosives combined with improved warhead and booster designed to support technology transitions. Continue modeling and data base improvements and application that reduce and enhance IM warhead design and test eforts.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603609N PROJECT NUMBER: S0363
PROGRAM ELEMENT TITLE: Conventional Munitions PROJECT TITLE: IM Advanced Development

- (U) ($3,078) Evaluate and demonstrate IM propellants and propulsion systems which provide improved or comparable performance to in-service systems and better IM characteristics. Combine candidate IM propellants and case concepts to demonstrate compliance with IM and performance requirements. Complete demonstration and evaluation of prototype IM dual thrust rocket motor for surface missile systems (SMS).

3. (U) FY 1997 PLAN:

- (U) ($590) Continue validation and analysis of weapon systems POA&Ms for IM compliance. Analyze the availability of critical chemicals.

- (U) ($2,360) Demonstrate high explosives which show improved IM characteristics while maintaining or improving operational performance. Initiate deformable high explosives for new Anti-Air-Warfare Warheads.

- (U) ($1,132) Evaluate IM ordnance concepts. Conduct system demonstrations of new high explosives combined with improved warhead and booster designed to support technology transitions. Continue data base applications that reduce and enhance IM warhead design and test efforts.

- (U) ($3,224) Evaluate and demonstrate IM propellants and propulsion systems which provide improved or comparable performance to in-service systems and better IM characteristics. Initiate formulation evaluation of ADN based propellant. Combine candidate IM propellants and case concepts to demonstrate compliance with IM and performance requirements. Complete demonstration and evaluation of prototype IM Booster rocket motor for surface missile systems (SMS).

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603609N PROGRAM ELEMENT TITLE: Conventional Munitions PROJECT NUMBER: S0363 PROJECT TITLE: IM Advanced Development

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996 President's Budget:	12,571	7,872	9,962
(U) Adjustments from PRESBUDG:	-141	-244	-2,656
(U) FY 1997 PRESBUDG Submit:	12,430	7,628	7,306

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1995 decrease due to program rebalancing. FY 1996 decrease due to Congressional undistributed general and inflation reductions and FY 1997 reductions due to revised inflation estimates and other minor pricing adjustments ($1,656) and funding for the FY 1997 Mine Warfare Campaign Plan.

(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 0601153N (Defense Research Sciences)
(U) PE 0602314N (Undersea Surveillance and Weapons Technology)
(U) PE 0602315N (MCM, Mining and Special Warfare Technology)
(U) PE 0603216N (Aviation Survivability)
(U) PE 0604603N (Unguided Conventional Air-launched Weapons)
(U) Cooperative technology transfer efforts with all weapons project offices are in progress. Close liaison is maintained with PE 0603514N (Ship Combat Survivability).

D. (U) SCHEDULE PROFILE: Not applicable.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603609N PROJECT NUMBER: U1821
PROGRAM ELEMENT TITLE: Conventional Munitions PROJECT TITLE: Conv Fuze/WH Package

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
U1821 Conventional Fuze and Warhead Package	27,077	26,701	19,184	18,803	20,624	19,602	19,553	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Navy requires improved lethality of air and surface launched ordnance to defeat advanced threats. This is the only Navy 6.3B RDT&E program that addresses improvements in warhead and fuze technology and provides a vehicle for orderly planning and transition of Navy 6.2 and 6.3A investments into E&MD for Navy missile systems. This project improves SPARROW missile capability to defeat existing and near term deceptive counter measures with the Missile Homing Improvement Program (MHIP). This project also addresses increased lethality against current and emerging threats with the development of an integrated guidance and fuzing system, a multi-focusing warhead system, and Direct Hit Multi-Mode Strike and Ordnance Systems. This project will, in future years, also provide the vehicle to address emergent requirements by transitioning mature development with minimum technical and financial risk.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS:

- (U) ($3,500) Conducted At-Sea OPEVAL for SM-2 Block IIIB.
- (U) ($1,734) Continued Pre-planned Product Improvement (P3I) Program for SM-2 Block IIIB.
- (U) ($4,000) Completed EDM Missile Fabrication.
- (U) ($3,738) GUIDANCE INTEGRATED FUZE: Continued hardware critical experiments on Radio Frequency (RF) energy and laser ranges; continued detailed analysis, development, and simulation.
- (U) ($3,585) DIRECTIONAL ORDNANCE SYSTEM (DOS) (Combined Advanced Aimed Warhead and Advanced Aimed Fuze): Continued system analysis and design of system components; performed critical tests for evaluation of system components and performed system integration tests.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603609N PROJECT NUMBER: U1821
PROGRAM ELEMENT TITLE: Conventional Munitions PROJECT TITLE: Conv. Fuze/WH Package

- (U) ($2,200) ADVANCED AAW WARHEAD IMPROVEMENTS: Initiated project to improve fragmenting warheads, safe and arm (S&A) devices and fuze contact devices (FCD). Conducted static warhead firings.
- (U) ($800) ADVANCED STRIKE WARHEAD IMPROVEMENTS: Initiated project to improve fuze system to allow proper multi-mode warhead functioning against hard and soft targets for SLAM, Tomahawk and other strike systems. Conducted static arena tests.
- (U) ($5,800) MULTI-FUNCTION FUZE: Made Producibility Enhancements, fabricated and evaluated 100-150 fuzes, and updated technical data package.
- (U) ($520) ORDNANCE COMPONENT TECHNOLOGY: Continued with fabrication of demonstration hardware and conducted lab and field demonstration tests. Completed effort on multipole high-voltage switch.
- (U) ($1,200) PASSIVE/ACTIVE (PACT) FUZE: Initiated project to develop a proximity fuze for a high single shot kill probability against air threats that are high speed, highly maneuverable, small in RCS and flying at extremely low altitudes above sea surface. Defined requirements and formulated concept. Initiated supporting investigations.

2. (U) FY 1996 PLAN:

- (U) ($7,300) DIRECTIONAL ORDNANCE SYSTEM: Complete system design and integration tests and define system demonstration configuration; continue with system analysis and risk assessments.
- (U) ($1,540) ADVANCED STRIKE WARHEAD IMPROVEMENT: Continue system analysis and design; initiate system integration tests.
- (U) ($7,165) DIRECT-HIT FUZE AND WARHEAD: Select concept and intiate prototype design and development.
- (U) ($580) ORDNANCE COMPONENT TECHNOLOGY: Complete effort on universal Safe and Arming (S-A) chipset; continue with efforts on initiation systems and customized S-A Components; initiate effort on high G fiber-optic accelerometer.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603609N PROJECT NUMBER: U1821
PROGRAM ELEMENT TITLE: Conventional Munitions PROJECT TITLE: Conv. Fuze/WH Package

- (U) ($5,879) MULTI-FUNCTION FUZE: Engineering, manufacturing, producibility enhancement for OPEVAL/TECHEVAL. Evaluate 1000 fuzes and update technical data package.
- (U) ($3,999) MHIP DT/OT.

(U) ($ 238) SBIR: Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15 U.S.C. 638.

3. (U) FY 1997 PLAN:
- (U) ($6,360) DIRECTIONAL ORDNANCE SYSTEM: Conduct system demonstration; perform affordability assessment; develop specifications, drawings, and design and test data reports; prepare system demonstration report.
- (U) ($3,443) ADVANCED STRIKE WARHEAD IMPROVEMENT: Complete multimode warhead and penetration fuze integration tests and validate concept.
- (U) ($500) ORDNANCE COMPONENT TECHNOLOGY: Complete effort on initiation system; continue with very high energy energy density capacitors and high G fiber-optic accelerometer efforts.
- (U) ($2,878) MULTI-FUNCTION FUZE: Perform certification of OPEVAL/TECHEVAL and laboratory testing.
- (U) ($6,003) DIRECT HIT FUZE WARHEAD: Build prototype and conduct test and evaluation.

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996 President's Budget:	28,394	23,665	22,342
(U) Adjustments from PRESBUDG:	-1,317	+3,036	-3,158
(U) FY 1997 PRESBUDG Submit:	27,077	26,701	19,184

(U) CHANGE SUMMARY EXPLANATION:
(U) Funding: Change in FY 1995 funding is due to program restructuring. Increase in FY 1996 is also due to program restructuring. Decrease in FY 1997 is due to revised inflation estimates and other minor pricing adjustments ($2,958) and funding for the FY 1997 Mine Warfare Campaign Plan ($200).

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603609N PROJECT NUMBER: U1821
PROGRAM ELEMENT TITLE: Conventional Munitions PROJECT TITLE: Conv. Fuze/WH Package

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

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

	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
WPN Line 18 SPARROW Mods	12,646	2,903	2,530	25,963	65,522	74,301	73,655	0	352,397

(U) RELATED RDT&E:

(U) PE 0603755N (SHIP SELF DEFENSE)

(U) PE 0604366N (STANDARD Missile Improvements) Block IIIB fully describes the common milestones for joint program that adds a common seeker to both STANDARD Missile and SPARROW Missile.

D. (U) SCHEDULE PROFILE:

	FY 1995	FY 1996	FY 1997	TO COMPLETE
Program Milestones		SPARROW 4Q MS III		
Engineering Milestones				
T&E Milestones		SPARROW 1Q TECHEVAL 2Q OPEVAL		
Contract Milestones		SPARROW 2Q LRIP 4Q PROD		

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603609N PROJECT NUMBER: U1821
PROGRAM ELEMENT TITLE: Conventional Munitions PROJECT TITLE: Conv Fuze/WH Package

A. (U) PROJECT COST BREAKDOWN: ($ in thousands) (Note 1)

Project Cost Categories	FY 1995	FY 1996	FY 1997
a. Design and Analysis	12,439	11,964	9,498
b. Hardware Fabrication & Procurement	3,110	5,135	3,000
c. Demonstration Test & Evaluation	5,298	5,353	6,536
d. Operational Test & Evaluation	2,975	3,999	0
e. Engineering Support	2,600	0	0
f. Program Management Support	500	200	100
g. Travel	50	50	50
h. Other/Misc	105	0	0
Total	27,077	26,701	19,184

Note 1: MHIP project is also funded by PE 0604366N, Project U0439.

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603609N PROJECT NUMBER: U1821
PROGRAM ELEMENT TITLE: Conventional Munitions PROJECT TITLE: Conv Fuze/WH Package

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 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Product Development										
Naval Surface Warfare Center/Dahlgren	WR	Various	CONT.	CONT.	7,992	10,475	11,894	6,525	CONT.	CONT.
IRISS(Note 1)	CPAF	12/89	184,330	184,330	79,279	2,958	0	0	0	82,237
Motorola	CPAF	Various	CONT.	CONT.	0	400	1,000	1,800	CONT.	CONT.
NAVSUP	WR	05/96	650	650	0	0	650	0	0	650
Naval Air Warfare Center Weapons Div/ China Lake	WR	Various	CONT.	CONT.	38,273	9,950	4,555	4,173	CONT.	CONT.
Support and Management										
Naval Air Warfare Center Weapons Div/ China Lake	WR	Various			2,385					
Various	Various	Various	CONT.	CONT.	652	497	303	260	CONT.	CONT.

(1) This contract is funded by PE 0603609N and PE 0604366N.

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603609N PROJECT NUMBER: U1821
PROGRAM ELEMENT TITLE: Conventional Munitions PROJECT TITLE: Conv Fuze/WH Package

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Test and Evaluation										
NAWC China Lake	WR	Various	CONT.	CONT.	3,916	1,666	5,499	1,500	CONT.	CONT.
NSWC Dahlgren	WR	Various	CONT.	CONT.	442	1,131	2,800	2,103	CONT.	CONT.
COMOPTEVFOR	PD	Various	CONT.	CONT.	3,950	0	0	2,823	CONT.	CONT.

GOVERNMENT FURNISHED PROPERTY: Not applicable.

Item Description	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Delivery Date	Total FY 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Product Development									
Support and Management									
Test and Evaluation									
Total									

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603609N
PROGRAM ELEMENT TITLE: Conventional Munitions

PROJECT NUMBER: U1821
PROJECT TITLE: Conv Fuze/WH Package

	FY 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Subtotal Product Development	125,544	2[illegible],783	18,099	12,498	CONT.	CONT.
Subtotal Support and Management	3,037	497	303	260	CONT.	CONT.
Subtotal Test and Evaluation	8,308	2,797	8,299	6,426	CONT.	CONT.
Total Project	136,889	27,077	26,701	19,184	CONT.	CONT.

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FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603611M
PROGRAM ELEMENT TITLE: Marine Corps Assault Amphibious Vehicles

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
B0020 Advanced Amphibious Assault Vehicle (AAAV)[1]	27,701	37,010	40,106	60,239	104,146	92,798	110,376	CONT.	CONT.
C2237 Amphibious Vehicle Test Branch (AVTB)	1,457	1,812	0	0	0	0	0	0	3,243
TOTAL	29,158	38,822	40,106	60,239	104,146	92,798	110,376	CONT.	CONT.

[1] FY 1995 and beyond AAV7A1 funding and discussion are contained in Program Element (PE) 0206623M, Marine Corps Ground Combat/ Supporting Arms Systems, Project C0021, AAV7A1. FY 1995 and beyond AVTB funding and discussion are contained in Project C2237 under this PE in FY95 and FY96 in PE 0206623M in FY97 and beyond.

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The AAAV program will field a successor to the Marine Corps' current amphibious vehicle, the AAV7A1. The AAAV will provide the principal means of tactical surface mobility for the Marine Air-Ground Task Force (MAGTF) during both ship-to-shore maneuver and subsequent combat operations ashore. 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 DEMONSTRATION & VALIDATION because it develops and integrates hardware for experimental test related to specific ship or aircraft applications.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603611M
PROGRAM ELEMENT TITLE: Marine Corps Assault Amphibious Vehicles

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
B0020 Advanced Amphibious Assault Vehicle (AAAV)	27,701	37,010	40,106	60,239	104,146	92,798	110,376	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The AAAV program will field a successor to the Marine Corps' current amphibious vehicle, the Advanced Amphibious Vehicle 7A1 (AAV7A1). The AAAV will provide the principal means of tactical surface mobility for the Marine Air-Ground Task Force (MAGTF) during both ship-to-shore maneuver and subsequent combat operations ashore.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS:

- (U) ($12,973) Continued design, fabrication and testing of operational mock-ups of the VC/WS.
- (U) ($1,883) Completed fabrication and contractor testing, and initiated government testing of the full-scale ATRs.
- (U) ($1,034) Continued detail design, fabrication and component laboratory tests of the two-stage, single axis turbocharger for the advanced version (Version B) of the 2,600 Hp MTU diesel engine.
- (U) ($636) Continued re-design, modification and 400 hour FMIT of the 2,600 Hp MTU (Version A) diesel engine.
- (U) ($1,040) Completed design analyses and preliminary design of the two-stage, in-line turbocharger for the advanced version (Version B) of the 2,600 Hp MTU diesel engine.
- (U) ($2,628) Continued to provide for program management support to coordinate and update program planning.
- (U) ($2,816) Provided in-house support. Enlisted program support and completed Defense Acquisition Board (DAB) Milestone I review.

- (U) ($591) Conducted testing and evaluation of ATRs.
- (U) ($4,100) Continued rotary engine development in accordance with Congressional direction.

2. (U) FY 1996 PLAN:

- (U) ($19,627) Initiate competitive award of the Demonstration and Validation (Dem/Val) phase contract.
- (U) ($1,844) Complete design, fabrication and testing of operational mock-ups of the VC/WS.
- (U) ($1,500) Conduct detail design of remaining peripherals of MTU Version B engine development. as directed in accordance with Congressional direction.
- (U) ($566) Continued re-design, modification and 400 hour FMIT of the 2,600 Hp MTU (Version A) diesel engine.
- (U) ($3,363) Completed re-design, fabrication and component laboratory tests of the two-stage, single axis turbocharger for the advanced version (Version B) of the 2,600 Hp MTU diesel engine.
- (U) ($6,797) Continue to provide in-house support.
- (U) ($2,038) Continue to enlist program support to coordinate and update program planning.
- (U) ($531) Conduct test and evaluation of operational mock-up weapon stations.
- (U) ($744) Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15 U.S.C.638.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603611M
PROGRAM ELEMENT TITLE: Marine Corps Assault Amphibious Vehicles
PROJECT NUMBER: B0020
PROJECT TITLE: Advanced Amphibious Assault Vehicle (AAAV)

3. (U) FY 1997 PLAN:

- (U) ($35,864) Continue Dem/Val phase which includes, contractor design, modeling, and simulation of the AAAV Personnel (P) and Command (C) prototypes.
- (U) ($1,842) Continue to provide in-house support.
- (U) ($2,400) Continue to enlist program support to coordinate and update program planning.

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996 President's Budget:	32,700	32,366	31,379
(U) Adjustments from FY 1996 PRESBUD:	-4,999	4,644	8,727
(U) FY 1997 PRESBUD Submit:	27,701	37,010	40,106

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1996 funding was increased by $6,000 as a Congressional increase. FY 1996 funding was decreased by $1,203 for Congressional undistributed reductions and reprogramming/rescission offsets. FY 1997 was increased by $10,000 in PDM II, 30 September 1995 accelerating the program nine months in the Demonstration/Validation Phase with corresponding reductions for decreased escalation.

(U) Schedule: Increased funding to accelerate initial operating capability of the AAAV to FY 2007.

(U) Technical: Not applicable.

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

(U) RELATED RDT&E:

(U) PE 0206623M (Marine Corps Ground Combat/Supporting Arms Systems), Project C0021, AAV7A1

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603611M
PROGRAM ELEMENT TITLE: Marine Corps Assault Amphibious Vehicles

PROJECT NUMBER: B0020
PROJECT TITLE: Advanced Amphibious Assault Vehicle (AAAV)

D. (U) SCHEDULE PROFILE:

	FY 1995	FY 1996	FY 1997	TO COMPLETE
Program Milestones	2Q MS I			
Engineering Milestones				
T&E Milestones		100 HOUR ENGINE DEMO	400 HOUR ENGINE	
Contract Milestones		3Q DEM/VAL AWARD		

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603611M PROGRAM ELEMENT TITLE: Marine Corps Assault Amphibious Vehicles PROJECT NUMBER: B0020 PROJECT TITLE: Advanced Amphibious Assault Vehicle (AAAV)

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

Project Cost Categories	FY 1995	FY 1996	FY 1997
a. Product Development (AAAV)	21,666	27,797	35,864
b. Support and Management (AAAV)	5,444	8,682	4,242
c. Test and Evaluation (AAAV)	591	531	0
d. Contractor Engineering Support (AAV7A1)	0	0	0
d. Government Engineering Support (AAV7A1)	0	0	0
e. Ancillary Hardware Development (AAV7A1)	0	0	0
f. Travel (AAV7A1)	0	0	0
g. Travel, Supplies, and Services (AVTB)	0	0	0
h. Civilian Personnel (AVTB)	0	0	0
Total	27,701	37,010	40,106

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603611M PROGRAM ELEMENT TITLE: Marine Corps Assault Amphibious Vehicles PROJECT NUMBER: B0020 PROJECT TITLE: Advanced Amphibious Assault Vehicle (AAAV)

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 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Product Development (The following performing organizations are in support of the AAAV program).										
TBD (DEM/VAL)	CPAF	MAY 96	0	0	0	0	19,780	34,926	CONT.	CONT.
GDLS (Turret), Warren, MI	CPFF	JAN 95	7,609	7,609	0	7,169	440	0	0	7,609
UDLP (Turret), San Jose, CA	CPFF	DEC 94	6,454	6,454	234	5,350	870	0	0	6,454
MTU (Engine B), Friedrichshafen, Germany (#9071)	CPFF	APR 94	3,800	3,800	1,260	1,040	1,500	0	0	3,800
GDLS (ATR), Warren, MI	CPFF	SEP 93	16,497	16,497	15,014	1,483	0	0	0	16,497
FMC/UDLP (ATR), San Jose, CA	CPFF	SEP 93	14,886	14,886	14,486	400	0	0	0	14,886
MTU (Engine A II), Friedrichshafen, Germany (#9189)	CPFF	APR 93	6,160	6,160	5,548	287	325	0	0	6,160
MTU (Engine B/Version B), Friedrichshafen, Germany (#9061)	CPFF	APR 95	2,700	2,700	1,100	1,034	566	0	0	2,700
MTU (Engine Re-build/Version B 400 Hr Test), Friedrichshafen, Germany (#9102)	CPFF	JUN 95	4,708	4,708	709	636	3,363	0	0	4,708
RPI (SCRE), Woodbridge, NJ	CPFF		8,600	8,600	4,500	4,100	0	0	0	8,600
MISCELLANEOUS	VARIOUS	VARIOUS			1,743	140	953	938	CONT.	CONT.
Total Product Development					44,594	21,639	27,797	35,864	CONT.	CONT.

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603611M PROGRAM ELEMENT TITLE: Marine Corps Assault Amphibious Vehicles PROJECT NUMBER: B0020 PROJECT TITLE: Advanced Amphibious Assault Vehicle (AAAV)

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Support and Management										
(The following performing organizations are in support of the AAAV program).										
TMA, Arlington, VA	CPFF	DEC 93			509	1,209	1,358	1,200	CONT.	CONT.
MISCELLANEOUS (Contracts)	CPFF	VARIOUS			2,652	1,419	680	1,200	CONT.	CONT.
MISCELLANEOUS (Government Laboratories)	WR				10,054	2,816	3,644	1,842	CONT.	CONT.
MODELING and SIMULATION	WR				0	0	3,000	0	CONT.	CONT.
Total Support and Management					13,215	5,444	8,682	4,242	CONT.	CONT.
Test and Evaluation (The following performing organizations are in support of the AAAV program).										
MISCELLANEOUS	VARIOUS	VARIOUS			424	591	531	0	CONT.	CONT.
Total Test and Evaluation					424	591	531	0	CONT.	CONT.

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603611M PROGRAM ELEMENT TITLE: Marine Corps Assault Amphibious Vehicles PROJECT NUMBER: B0020 PROJECT TITLE: Advanced Amphibious Assault Vehicle (AAAV)

GOVERNMENT FURNISHED PROPERTY:

Item Description	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Delivery Date	Total FY 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Product Development:	AAAV Misc In-house laboratories			0	27	0	0	0	27

Support and Management: Not applicable.

Test and Evaluation: Not applicable.

000346

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603611M
PROGRAM ELEMENT TITLE: Marine Corps Assault Amphibious Vehicles
PROJECT NUMBER: B0020
PROJECT TITLE: Advanced Amphibious Assault Vehicle (AAAV)

	Total FY 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Subtotal Product Development	44,594	21,666	27,797	35,864	CONT.	CONT.
Subtotal Support and Management	13,215	5,444	8,682	4,242	CONT.	CONT.
Subtotal Test and Evaluation	424	591	531	0	CONT.	CONT.
Total Project	58,233	27,701	37,010	40,106	CONT.	CONT.

C. (U) FUNDING 1995 PROFILE: N/A

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603611M
PROGRAM ELEMENT TITLE: Marine Corps Assault Amphibious Vehicles

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
B0020 Advanced Amphibious Assault Vehicle (AAAV)[1]	27,701	37,010	40,106	60,239	104,146	92,798	110,376	CONT.	CONT.
C2237 Amphibious Vehicle Test Branch (AVTB)	1,457	1,812	0	0	0	0	0	0	3,243
TOTAL	29,158	38,822	40,106	60,239	104,146	92,798	110,376	CONT.	CONT.

[1] FY 1995 and beyond AAV7A1 funding and discussion are contained in Program Element (PE) 0206623M, Marine Corps Ground Combat/ Supporting Arms Systems, Project C0021, AAV7A1. FY 1995 and beyond AVTB funding and discussion are contained in Project C2237 under this PE in FY95 and FY96 in PE 0206623M in FY97 and beyond.

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The AAAV program will field a successor to the Marine Corps' current amphibious vehicle, the AAV7A1. The AAAV will provide the principal means of tactical surface mobility for the Marine Air-Ground Task Force (MAGTF) during both ship-to-shore maneuver and subsequent combat operations ashore. 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 DEMONSTRATION & VALIDATION because it develops and integrates hardware for experimental test related to specific ship or aircraft applications.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603611M
PROGRAM ELEMENT TITLE: Marine Corps Assault Amphibious Vehicles

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
B0020 Advanced Amphibious Assault Vehicle (AAAV)	27,701	37,010	40,106	60,239	104,146	92,798	110,376	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The AAAV program will field a successor to the Marine Corps' current amphibious vehicle, the Advanced Amphibious Vehicle 7A1 (AAV7A1). The AAAV will provide the principal means of tactical surface mobility for the Marine Air-Ground Task Force (MAGTF) during both ship-to-shore maneuver and subsequent combat operations ashore.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS:

- (U) ($12,973) Continued design, fabrication and testing of operational mock-ups of the VC/WS.
- (U) ($1,883) Completed fabrication and contractor testing, and initiated government testing of the full-scale ATRs.
- (U) ($1,034) Continued detail design, fabrication and component laboratory tests of the two-stage, single axis turbocharger for the advanced version (Version B) of the 2,600 Hp MTU diesel engine.
- (U) ($636) Continued re-design, modification and 400 hour FMIT of the 2,600 Hp MTU (Version A) diesel engine.
- (U) ($1,040) Completed design analyses and preliminary design of the two-stage, in-line turbocharger for the advanced version (Version B) of the 2,600 Hp MTU diesel engine.
- (U) ($2,628) Continued to provide for program management support to coordinate and update program planning.
- (U) ($2,816) Provided in-house support. Enlisted program support and completed Defense Acquisition Board (DAB) Milestone I review.

- (U) ($591) Conducted testing and evaluation of ATRs.
- (U) ($4,100) Continued rotary engine development in accordance with Congressional direction.

2. (U) FY 1996 PLAN:

- (U) ($19,627) Initiate competitive award of the Demonstration and Validation (Dem/Val) phase contract.
- (U) ($1,844) Complete design, fabrication and testing of operational mock-ups of the VC/WS.
- (U) ($1,500) Conduct detail design of remaining peripherals of MTU Version B engine development. as directed in accordance with Congressional direction.
- (U) ($566) Continued re-design, modification and 400 hour FMIT of the 2,600 Hp MTU (Version A) diesel engine.
- (U) ($3,363) Completed re-design, fabrication and component laboratory tests of the two-stage, single axis turbocharger for the advanced version (Version B) of the 2,600 Hp MTU diesel engine.
- (U) ($6,797) Continue to provide in-house support.
- (U) ($2,038) Continue to enlist program support to coordinate and update program planning.
- (U) ($531) Conduct test and evaluation of operational mock-up weapon stations.
- (U) ($744) Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15 U.S.C.638.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603611M PROGRAM ELEMENT TITLE: Marine Corps Assault Amphibious Vehicles PROJECT NUMBER: B0020 PROJECT TITLE: Advanced Amphibious Assault Vehicle (AAAV)

3. (U) FY 1997 PLAN:

- (U) ($35,864) Continue Dem/Val phase which includes, contractor design, modeling, and simulation of the AAAV Personnel (P) and Command (C) prototypes.
- (U) ($1,842) Continue to provide in-house support.
- (U) ($2,400) Continue to enlist program support to coordinate and update program planning.

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996 President's Budget:	32,700	32,366	31,379
(U) Adjustments from FY 1996 PRESBUD:	-4,999	4,644	8,727
(U) FY 1997 PRESBUD Submit:	27,701	37,010	40,106

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1996 funding was increased by $6,000 as a Congressional increase. FY 1996 funding was decreased by $1,203 for Congressional undistributed reductions and reprogramming/rescission offsets. FY 1997 was increased by $10,000 in PDM II, 30 September 1995 accelerating the program nine months in the Demonstration/Validation Phase with corresponding reductions for decreased escalation.

(U) Schedule: Increased funding to accelerate initial operating capability of the AAAV to FY 2007.

(U) Technical: Not applicable.

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

(U) RELATED RDT&E:

(U) PE 0206623M (Marine Corps Ground Combat/Supporting Arms Systems), Project C0021, AAV7A1

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603611M
PROGRAM ELEMENT TITLE: Marine Corps Assault Amphibious Vehicles

PROJECT NUMBER: B0020
PROJECT TITLE: Advanced Amphibious Assault Vehicle (AAAV)

D. (U) SCHEDULE PROFILE:

	FY 1995	FY 1996	FY 1997	TO COMPLETE
Program Milestones	2Q MS I			
Engineering Milestones				
T&E Milestones		100 HOUR ENGINE DEMO		400 HOUR ENGINE
Contract Milestones		3Q DEM/VAL AWARD		

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603611M
PROGRAM ELEMENT TITLE: Marine Corps Assault Amphibious Vehicles
PROJECT NUMBER: B0020
PROJECT TITLE: Advanced Amphibious Assault Vehicle (AAAV)

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

Project Cost Categories	FY 1995	FY 1996	FY 1997
a. Product Development (AAAV)	21,666	27,797	35,864
b. Support and Management (AAAV)	5,444	8,682	4,242
c. Test and Evaluation (AAAV)	591	531	0
d. Contractor Engineering Support (AAV7A1)	0	0	0
d. Government Engineering Support (AAV7A1)	0	0	0
e. Ancillary Hardware Development (AAV7A1)	0	0	0
f. Travel (AAV7A1)	0	0	0
g. Travel, Supplies, and Services (AVTB)	0	0	0
h. Civilian Personnel (AVTB)	0	0	0
Total	27,701	37,010	40,106

000353

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603611M PROGRAM ELEMENT TITLE: Marine Corps Assault Amphibious Vehicles PROJECT NUMBER: B0020 PROJECT TITLE: Advanced Amphibious Assault Vehicle (AAAV)

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 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Product Development (The following performing organizations are in support of the AAAV program).										
TBD (DEM/VAL)	CPAF	MAY 96	0	0	0	0	19,780	34,926	CONT.	CONT.
GDLS (Turret), Warren, MI	CPFF	JAN 95	7,609	7,609	0	7,169	440	0	0	7,609
UDLP (Turret), San Jose, CA	CPFF	DEC 94	6,454	6,454	234	5,350	870	0	0	6,454
MTU (Engine B), Friedrichshafen, Germany (#9071)	CPFF	APR 94	3,800	3,800	1,260	1,040	1,500	0	0	3,800
GDLS (ATR), Warren, MI	CPFF	SEP 93	16,497	16,497	15,014	1,483	0	0	0	16,497
FMC/UDLP (ATR), San Jose, CA	CPFF	SEP 93	14,886	14,886	14,486	400	0	0	0	14,886
MTU (Engine A II), Friedrichshafen, Germany (#9189)	CPFF	APR 93	6,160	6,160	5,548	287	325	0	0	6,160
MTU (Engine B/Version B), Friedrichshafen, Germany (#9061)	CPFF	APR 95	2,700	2,700	1,100	1,034	566	0	0	2,700
MTU (Engine Re-build/Version B 400 Hr Test), Friedrichshafen, Germany (#9102)	CPFF	JUN 95	4,708	4,708	709	636	3,363	0	0	4,708
RPI (SCRE), Woodbridge, NJ	CPFF		8,600	8,600	4,500	4,100	0	0	0	8,600
MISCELLANEOUS	VARIOUS	VARIOUS			1,743	140	953	938	CONT.	CONT.
Total Product Development					44,594	21,639	27,797	35,864	CONT.	CONT.

C09354

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603611M
PROGRAM ELEMENT TITLE: Marine Corps Assault Amphibious Vehicles

PROJECT NUMBER: B0020
PROJECT TITLE: Advanced Amphibious Assault Vehicle (AAAV)

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Support and Management										
(The following performing organizations are in support of the AAAV program).										
TMA, Arlington, VA										
	CPFF	DEC 93			509	1,209	1,358	1,200	CONT.	CONT.
MISCELLANEOUS (Contracts)										
	CPFF	VARIOUS			2,652	1,419	680	1,200	CONT.	CONT.
MISCELLANEOUS (Government Laboratories)										
	WR				10,054	2,816	3,644	1,842	CONT.	CONT.
MODELING and SIMULATION										
	WR				0	0	3,000	0	CONT.	CONT.
Total Support and Management					13,215	5,444	8,682	4,242	CONT.	CONT.
Test and Evaluation										
(The following performing organizations are in support of the AAAV program).										
MISCELLANEOUS	VARIOUS	VARIOUS			424	591	531	0	CONT.	CONT.
Total Test and Evaluation					424	591	531	0	CONT.	CONT.

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603611M PROGRAM ELEMENT TITLE: Marine Corps Assault Amphibious Vehicles PROJECT NUMBER: B0020 PROJECT TITLE: Advanced Amphibious Assault Vehicle (AAAV)

GOVERNMENT FURNISHED PROPERTY:

Item Description	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Delivery Date	Total FY 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Product Development:	AAAV Misc In-house laboratories			0	27	0	0	0	27

Support and Management: Not applicable.

Test and Evaluation: Not applicable.

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4
PROGRAM ELEMENT: 0603611M
PROGRAM ELEMENT TITLE: Marine Corps Assault Amphibious Vehicles
PROJECT NUMBER: B0020
PROJECT TITLE: Advanced Amphibious Assault Vehicle (AAAV)

	Total FY 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Subtotal Product Development	44,594	21,666	27,797	35,864	CONT.	CONT.
Subtotal Support and Management	13,215	5,444	8,682	4,242	CONT.	CONT.
Subtotal Test and Evaluation	424	591	531	0	CONT.	CONT.
Total Project	58,233	27,701	37,010	40,106	CONT.	CONT.

C. (U) FUNDING 1995 PROFILE: N/A

000357

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1995

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603611M
PROGRAM ELEMENT TITLE: Marine Corps Assault Amphibious Vehicles

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
C2237 Amphibious Vehicle Test Branch (AVTB)	1,457	1,812	0	0	0	0	0	0	3,276

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project was formerly titled Amphibious Vehicle 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 equipments. 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) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS:

- (U) ($326) Provided for supplies, services, program support at AVTB test site to support scheduled Assault Amphibious Vehicle 7A1 (AAV7A1) and 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) ($203) 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. Inter-Service Support Agreement (ISSA) funding at MCB CAMPEN also paid for janitorial and grounds care through contracts administered by Procurement and Contracting (P&C) CAMPEN California.

- (U) ($928) Provided AVTB personnel civilian salaries to support scheduled AAV7A1 and AAAV developmental testing. Planned and conducted developmental tests and reported 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 affect 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. Provide 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. Provided technical reviews and recommendations regarding proposed Modification, Technical, Retrofit Instructions, and Retrofit Kit Hardware.

2. (U) FY 1996 PLAN:

- (U) ($417) Provide for supplies, services, and program support at AVTB test site to support scheduled AAV7A1 and AAAV developmental testing. 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) ($275) Provide funding for necessary services provided by MCB CAMPEN and off-station units for electricity, heating and other power charges; long distance telephone support; and calibration of laboratory test equipment and maintenance equipment. ISSA funding at MCB CAMPEN also pays for janitorial and grounds care through contracts administered by P&C CAMPEN California.

- (U) ($1,123) 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

000359

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1995

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603611M PROGRAM ELEMENT TITLE: Marine Corps Assault Amphibious Vehicles PROJECT NUMBER: C2237 PROJECT TITLE: Amphibious Vehicle Test Branch (AVTB)

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.

- (U) ($3) Small Business Innovation Research (SBIR): Portion of program reserved for Small Business Innovation Research assessment in accordance with 15 USC 538(f)(1)

3. (U) FY 1997 PLAN: Funding ($1,791) is contained in PE 0206623M, Marine Corps Ground Combat/Supporting Arms Systems, Project C2237, AVTB.

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996 President's Budget:	1,799	1,791	1,791
(U) Adjustments from FY 1996 PRESBUDG:	-342	21	-1,791
(U) FY 1997 PRESBUD Submit:	1,457	1,812	0

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1995 funding/program was adjusted to reflect "fact of life" changes. Schedules have been adjusted to accommodate funding changes. FY96 funding was increased by 75K and decreased by 54K due to undistributed congressional reductions and economic adjustments. Because the AVTB is a Department of Defense test facility that supports tracked and wheeled amphibious vehicle testing in salt water, FY 1997 and beyond funding was transferred from this PE to PE 0206623M. This transfer also separates the AVTB facility funding from the AAAV Acquisition Category I program funding.

(U) Schedule: This program is level of effort funded. Due to the FY 1995 decrease, there is a corresponding decrease in levels of effort; however, program schedules have been adjusted to accommodate funding changes.

(U) Technical: Not applicable.

C00360

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: March 1995

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603611M
PROGRAM ELEMENT TITLE: Marine Corps Assault Amphibious Vehicles

PROJECT NUMBER: C2237
PROJECT TITLE: Amphibious Vehicle Test Branch (AVTB)

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

(U) RELATED RDT&E:

(U) PE 0206623M (Marine Corps Ground Combat/Supporting Arms Systems), Project C2237, AVTB.

D. (U) SCHEDULE PROFILE:

	FY 1995	FY 1996	FY 1997	TO COMPLETE
Program Milestones				
Engineering Milestones				
T&E Milestones	AAV7A1 AND AAAV DT	AAV7A1 AND AAAV DT		
Contract Milestones				

000361

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1995

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603611M PROGRAM ELEMENT TITLE: Marine Corps Assault Amphibious Vehicles PROJECT NUMBER: C2237 PROJECT TITLE: Amphibious Vehicle Test Branch (AVTB)

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

Project Cost Categories	FY 1995	FY 1996	FY 1997
a. Supplies, Services and Program Support	529	689	0
b. Civilian Personnel	928	1,123	0
Total	1,457	1,812	[1]0

[1] FY 1997 funding ($1,791) is contained in PE 0206623M, Marine Corps Ground Combat/Supporting Arms Systems, Project C2237, AVTB.

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1995

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603611M PROGRAM ELEMENT TITLE: Marine Corps Assault Amphibious Vehicles PROJECT NUMBER: C2237 PROJECT TITLE: Amphibious Vehicle Test Branch (AVTB)

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 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Product Development: Not applicable.										
Support and Management										
1ST FSSG, Camp Pendleton, CA	WR	1ST QTR	27	27	0	12	15	0	0	27
MCLB, Barstow, CA	WR	1ST QTR	80	80	0	40	40	0	0	80
MCB CAMPEN, Camp Pendleton, CA	WR	1ST QTR	207	207	0	92	115	0	0	207
NWS, Seal Beach, CA	WR	1ST QTR	120	120	0	60	60	0	0	120
Total Support and Management			**434**	**434**	**0**	**204**	**230**	**0**	**0**	**434**
Test and Evaluation										
MCTSSA, Camp Pendleton, CA	WR	1ST QTR	2,809	2,809	0	1,248	1,582	0	0	2,809

GOVERNMENT FURNISHED PROPERTY: Not applicable.

000363

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1995

BUDGET ACTIVITY: 4
PROGRAM ELEMENT: 0603611M
PROGRAM ELEMENT TITLE: Marine Corps Assault Amphibious Vehicles
PROJECT NUMBER: C2237
PROJECT TITLE: Amphibious Vehicle Test Branch (AVTB)

	Total FY 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Subtotal Product Development	0	0	0	0	0	0
Subtotal Support and Management	0	204	230	0	0	434
Subtotal Test and Evaluation	0	1,248	1,582	0	0	2,809
Total Project	0	1,457	1,812	0	0	3,243

C. (U) FUNDING PROFILE: N/A

000364

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FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603612M
PROGRAM ELEMENT TITLE: Marine Corps Mine Countermeasures

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
C2104 Off/Route Smart Mine Clearance (ORSMC)[1]	0	0	592	3,957	2,134	0	0	0	6,683
C2106 Standoff Mine Breacher[2]	4,540	1,722	0	0	0	0	0	0	6,262
TOTAL	4,540	1,722	592	3,957	2,134	0	0	0	12,945

1. FY 1995 and FY 1996 funding for Project C2104 is contained in Program Element (PE) 0603640M, Marine Corps Advanced Technology Demonstrations (ATD), Project C2223, the consolidated Marine Corps ATD project. FY 2000 through FY 2001 funding is contained in PE 0604612M, Marine Corps Mine Countermeasures (Engineering), Project C2104, Off/Route Smart Mine Clearance (ORSMC). This project develops and demonstrates explosive, mechanical, and electro-magnetic technologies and concepts for neutralizing advanced and hardened threat land mines; wide-area, off-route smart mines; unexploded ordnance: and other neutralization in-stride with assault operations; very high neutralization percentages against all types of mines; and neutralization with minimal hazard to personnel and equipment.

2. FY 1997 through FY 2001 funding for Project C2106 is contained in PE: 0604612M, Advanced Countermeasures System (ACS). The Standoff Minefield Breacher (SMB) program centers on neutralization of blast hardened and complex-fuzed mines, and unexploded munitions (current and future threat) that defeat the effectiveness of neutralization percentages against all types of mines; and joint applicability for use with primary assault platforms to include land and amphibious assaults.

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This PE focuses on the development and demonstration of mine clearing/countering devices.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under DEMONSTRATION & VALIDATION because it develops and integrates hardware for experimental test related to specific ship or aircraft applications.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603612M
PROGRAM ELEMENT TITLE: Marine Corps Mine Countermeasures

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
C2104 Off/Route Smart Mine Clearance (ORSMC)	0	0	592	3,957	2,134	0	0	0	6,683

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project was formerly titled Wide Area Mine Clearance (WAMC). This program develops and demonstrates explosive, mechanical, and electro-magnetic technologies and concepts for neutralizing advanced and hardened threat land mines; wide-area, off-route smart mines; unexploded ordnance; and other obstacles during amphibious assault operations and subsequent operation ashore and in littoral areas. Primary goals are: neutralization in-stride with assault operations; very high neutralization percentages against all types of mines; and neutralization with minimal hazard to personnel and equipment.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS: N/A

2. (U) FY 1996 PLAN: N/A

3. (U) FY 1997 PLAN:

   - (U) ($592) Prepare documentation and obtain Milestone I decision.

000367

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603612M
PROGRAM ELEMENT TITLE: Marine Corps Mine Countermeasures
PROJECT NUMBER: C2104
PROJECT TITLE: Off/Route Smart Mine Clearance (ORSMC)

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996 President's Budget:	0	0	3,185
(U) Adjustments from FY 1996 PRESBUDG:	0	0	-2,593
(U) FY 1997 PRESBUD Submit:	0	0	592

(U) CHANGE SUMMARY EXPLANATION: FY-97 change is due to inflation adjustments and a programatic reduction due to fiscal contraints.

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

(U) RELATED RDT&E:
(U) PE 0603606A (Landmine Warfare and Barrier Advanced Technology)
(U) Negotiations are underway to join Army programs and the SMB/ORSMC projects into joint programs at the appropriate milestone.
(U) PE 0603619A (Landmine Warfare and Barrier Advanced Demonstrations)
(U) PE 0604808A (Landmine Warfare and Barrier Engineering Development)
(U) PE 0602131M (Marine Corps Landing Force Technology)
(U) PE 0603612M (Marine Corps Mine Countermeasures Systems)
(U) PE 0603640M (Marine Corps Advanced Technology Demonstrations)
(U) PE 0604612M (Marine Corps Mine/Countermeasures Systems (Engineering))
(U) PE 0602315N (Mine Countermeasures, Mining and Special Warfare Technology)
(U) PE 0603555N (Sea Control and Littoral Warfare Technology Demonstration)
(U) PE 0603782N (Shallow Water Mine Countermeasures Demonstrations)
(U) This program is in compliance with Tri-Service Reliance Agreements.

D. (U) SCHEDULE PROFILE: Not applicable.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1995

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603612M

PROGRAM ELEMENT TITLE: Marine Corps Mine Countermeasures

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	To COMPLETE	TOTAL PROGRAM
C2106 Standoff Minefield Breacher (SMB)	4,540	1,722	0	0	0	0	0	0	6,269

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project was formerly titled Distributed Explosive Mine Neutralization System (DEMNS) and the Advanced Countermeasures System (ACS). The SMB program centers on neutralization of blast-hardened and complex-fuzed mines, and unexploded munitions (current and future threat) that defeat the effectiveness of current minefield breaching systems. Primary goals are: neutralization in-stride from a standoff position; very high neutralization percentages against all types of mines; and joint applicability for use with primary assault platforms to include land and amphibious assaults. This joint Army/Marine Corps program, with the Army as the lead service, satisfies the Army's standoff minefield breaching requirement.

(U) The SMB program researches and develops assault minefield breaching capabilities that will neutralize current and future blast-hardened and complex-fuzed mines from a standoff position. SMB will alleviate a critical deficiency in breaching minefields during amphibious operations. Current breaching assets are 1950s technology that do not meet breaching mission requirements.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS:

- (U) ($3,288) Awarded Demonstration/Validation (DEM/VAL) contract for research and development of three explosive breaching systems and fifteen rounds of explosive charges.
- (U) ($25) Awarded support contract for program documentation, analysis, and technical support to the program management office.
- (U) ($1,227) Provided Army, Navy, and government laboratory salaries. Provided program support for program documentation functions and technical/contract support services.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603612M PROGRAM ELEMENT TITLE: Marine Corps Mine Countermeasures PROJECT NUMBER: C2106 PROJECT TITLE: Standoff Minefield Breacher (SMB)

2. (U) FY 1996 PLAN:

- (U) ($1,644) Continue DEM/VAL. Continue development and testing of system components.
- (U) ($45) Continue program documentation and contract progress analysis.
- (U) ($33) Continue to provide Army, Navy, and government laboratory salaries. Continue to provide program support for program documentation functions and technical/contract support services.

3. (U) FY 1997 PLAN: Funding ($2,791) is contained in PE 0604612M, Marine Corps Mine Countermeasures (Engineering), Project C2106, ACS.

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996 President's Budget:	6,434	2,470	0
(U) Adjustments from FY 1996 PRESBUDG:	-1,894	-748	0
(U) FY 1997 OSD/OMB Budget Submit:	4,540	1,722	0

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1995 funding/program was adjusted to reflect contract administrative delays "fact of life" changes. As a result of these administrative delays, explained in the Schedule section, FY 1995 funding was decreased by $-2,475K. An additional decrease in FY 1995 funding of $-94K was reprogrammed to EROWPU (PE 0206624M C0076) to fund an emergent requirement. FY 1995 funding was increased $675K and applied to the DEM/VAL contract. FY 1996 funding decreased -675K to fund APOBS (PE 0604612MM C1969), and an additional decrease of -73K for "Undistributed Congressional Reductions."

(U) Schedule: Administrative delays in cooperative efforts with the Army delayed joint designation of this program. Programmatic efforts to create joint documentation and Marine Corps Requirements Validation delayed Milestone I from the fourth quarter of FY 1994 to the second quarter of FY 1995. The Mission Needs Statement and Operational Requirements Document were completed in the first quarter of FY 1995. The DEM/VAL contract was awarded in the third quarter of FY 1995.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603612M PROGRAM ELEMENT TITLE: Marine Corps Mine Countermeasures PROJECT NUMBER: C2106 PROJECT TITLE: Standoff Minefield Breacher (SMB)

(U) Technical: Not applicable.

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

(U) RELATED RDT&E:

(U) PE 0603606A (Landmine Warfare and Barrier Advanced Technology)
(U) Negotiations are underway to join Army programs and the Off/Route Smart Mine Clearance (ORSMC) project into joint programs at the appropriate milestone.
(U) PE 0603619A (Landmine Warfare and Barrier Advanced Demonstrations)
(U) PE 0604808A (Landmine Warfare and Barrier Engineering Development)
(U) PE 0603640M (Marine Corps Advanced Technology Demonstrations)
(U) PE 0604612M (Marine Corps Mine Countermeasures (Engineering))

D. (U) SCHEDULE PROFILE:

	FY 1995	FY 1996	FY 1997	TO COMPLETE
Program Milestones	2Q MS I			1Q FY 1998 MS II 1Q FY 2002 MS III
Engineering Milestones			1Q PROTOTYPE DEL	1Q FY 2001 LRIP
T&E Milestones			2Q EDT* DT/OT I	4Q FY 2000 IOT&E
Contract Milestones	3Q AWARD (DEM/VAL)			

* EDT is Engineering Developmental Testing (performed by the government)

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKOUT

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603612M
PROGRAM ELEMENT TITLE: Marine Corps Mine Countermeasures

PROJECT NUMBER: C2106
PROJECT TITLE: Standoff Minefield Breacher (SMB)

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

Project Cost Categories	FY 1995	FY 1996	FY 1997
a. PM Civilian Salaries	1,222	554	0
b. Travel	5	15	0
c. Professional and Management Service	25	25	0
d. Hardware Development	2,000	503	0
e. Software Development	20	50	0
f. Systems Engineering	1,208	300	0
g. Integrated Logistics Support	30	20	0
h. Government Engineering Support	30	20	0
i. Developmental Test and Evaluation	0	235	0
j. Miscellaneous	0	0	0
Total	4,540	1,722	*0

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKOUT

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603612M

PROGRAM ELEMENT TITLE: Marine Corps Mine Countermeasures

PROJECT NUMBER: C2106

PROJECT TITLE: Standoff Minefield Breacher (SMB)

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 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Product Development										
Tracor Aerospace, Austin, TX	RCP	JUN 95	**4,932**	**4,932**	**0**	**3,288**	**1,644**	**0**	**0**	**4,932**
Support and Management										
MARCORSYSCOM, Quantico, VA	WR	OCT 95	80	80	10	25	45	0	0	80
ARDEC, Picatinny, NJ	WR	AUG 95	1,440	1,440	200	1,222	18	0	0	1,440
MCCDC, Quantico, VA	WR	AUG 95	355	355	335	5	15	0	0	355
Total Support and Management			**1,875**	**1,875**	**545**	**1,252**	**78**	**0**	**0**	**1,875**
Test and Evaluation										

GOVERNMENT FURNISHED PROPERTY: Not applicable.

000373

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKOUT DATE: March 1996

BUDGET ACTIVITY: 4
PROGRAM ELEMENT: 0603612M
PROGRAM ELEMENT TITLE: Marine Corps Mine Countermeasures
PROJECT NUMBER: C2106
PROJECT TITLE: Standoff Minefield Breacher (SMB)

	Total FY 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Subtotal Product Development	0	3,288	1,644	0	0	4,932
Subtotal Support and Management	545	1,252	78	0	0	1,875
Subtotal Test and Evaluation	0	0	0	0	0	0
Total Project	545	4,540	1,722	*0	0	6,807

000374

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FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603635M
PROGRAM ELEMENT TITLE: Marine Corps Ground Combat/Supporting Arms Systems

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
C1598 Nuclear/Biological/Chemical (NBC) Equipment[1]	2,298	0	0	0	0	0	0	0	20,140
C1964 Joint Anti-Armor Weapon System (JAAWS)/Javelin	171	485	463	473	471	467	464	CONT.	CONT.
C2112 Lightweight 155 millimeter Howitzer (LW155)	6,361	14,607	11,205	30,227	29,877	14,012	9,410	CONT.	CONT.
C2113 Short Range Anti-Armor Weapon (SRAW)/Predator	17,340	30,545	32,257	457	0	0	0	0	121,044
C2247 Coastal Battlefield Reconnaissance and Analysis (COBRA)[2]	0	3,701	0	0	0	0	0	0	3,819
C2248 Advanced Lightweight Ground Weaponry (ALWGW)[3]	0	0	0	0	955	948	2,824	CONT.	CONT.
C2249 Survivability System for Amphibious Vehicles[4]	0	0	0	0	0	0	1,883	CONT.	CONT.
C2250 Team Target Engagement Simulator (TTES)[5]	0	0	966	961	0	0	0	0	1,990
C2251 Joint Advanced Amphibious Logistics Technology[6]	0	0	0	0	0	948	2,824	CONT.	CONT.
TOTAL	26,170	49,338	44,891	32,118	31,303	16,375	17,405	CONT.	CONT.

[1] FY 1996 and beyond funding was transferred to the Army Joint Program office. Funding is contained in Program Element (PE) 0603806A, NBC Defense Systems, Advanced Development.

000376

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603635M
PROGRAM ELEMENT TITLE: Marine Corps Ground Combat/Supporting Arms Systems

[2] FY 1995 funding was contained in PE 0603640M, Marine Corps Advanced Technology Demonstrations (ATD), Project C2223, the consolidated Marine Corps ATD project. FY 1996 funding is split between two PEs: $2,935 in Project C2223 under PE 0603640M and $3,716 in this PE. FY 1997 and beyond funding is contained in PE 0206313M, Marine Air-Ground Task Force (MAGTF) Command, Control, Communications, Computers and Intelligence (C4I) Systems, Project C2272, Intelligence Command and Control (C2) Systems.

[3] FY 1995 through FY 1998 funding is contained in PE 0603640M, Project C2223. FY 1999 through FY 2001 funding is split between two PEs: $2,500, $2,000, and $2,000 (FY 1998 - FY 2001 respectively) in PE 0603640M, Project C2223 and $955, $948, and $2,824 (FY 1998 - FY 2001 respectively) in this PE.

[4] FY 1995 through FY 2000 funding is contained in PE 0603640M, Project C2223. FY 2001 funding is contained in the PE.

[5] FY 1994 through FY 1996 funding is contained in PE 0603640M, Project C2223. FY 1997 funding is split between two PEs: $1,000 in PE 0603640M, Project C2223 and $966 in this PE. FY 1998 funding is contained in this PE. FY 1999 and beyond funding is contained in PE 0604657M, Marine Corps Ground Combat/Supporting Arms Systems, Project C2253, TTES.

[6] FY 1995 funding was contained in PE 0602131M. FY 1996 through FY 1999 funding is contained in PE 0603640M, Project C2223. FY 2000 through FY 2001 funding is split between two PEs: $4,921 and $5,223 (FY 2000 - FY 2001 respectively) in PE 0603640M, Project C2223 and $948 and $2,824 (FY 2000 - FY 2001 respectively) in this PE.

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This PE supports the demonstration and validation of Marine Corps Ground/Supporting Arms Systems for utilization in Marine Air-Ground Expeditionary Force amphibious operations.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under DEMONSTRATION & VALIDATION because it develops and integrates hardware for experimental test related to specific ship or aircraft applications.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603635M
PROGRAM ELEMENT TITLE: Marine Corps Ground Combat/Supporting Arms Systems

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
C1964 Joint Anti-Armor Weapon System (JAAWS)/Javelin	171	485	463	473	471	467	464	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project provides for the Marine Corps' participation in the Joint Anti-Armor program entitled Javelin (Advanced Anti-tank Weapon System - Medium (AAWS-M)). This unique weapon system will provide the Marine Corps and Army with a state-of-the-art capability to destroy sophisticated and future armored threats. No such medium anti-armor system is currently available to the infantryman.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS:

- (U) ($23) Continued to monitor the joint program to include the Army's cost savings program.
- (U) ($10) Continued to participate in the joint program to include developmental testing of the P3I program.
- (U) ($0) (Army funded) Continued to monitor and participate in the joint program to include Low Rate Initial Production (LRIP) and follow-on testing.
- (U) ($130) Conducted safety engineering support, testing, technical support in fuzing warheads, and other Javelin program support initiatives.
- (U) ($8) Continued to participate in the joint program to include the area of Logistics Management.
- (U) ($0) Monitor Joint Livefire PQT.

000378

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603635M PROGRAM ELEMENT TITLE: Marine Corps Ground Combat/ Supporting Arms Systems PROJECT NUMBER: C1964 PROJECT TITLE: Joint Anti-Armor Weapon System (JAAWS)/Javelin

2. (U) FY 1996 PLAN:

- (U) ($70) Continue to monitor the joint program and participate in follow-on testing.
- (U) ($80) Update Milestone III documentation and prepare Marine Corps Acquisition Decision Memorandum (MCADM) documentation.
- (U) ($231) Monitor and participate in Production Qualification Test (PQT) and engineering changes to include warhead improvements.
- (U) ($94) Develop technical procedures and data bases necessary to perform as the Javelin missile In-service Engineering Agreement (ISEA).
- (U) ($10) Monitor necessary logistics aspects of the joint program.

3. (U) FY 1997 PLAN:

- (U) ($127) Continue to monitor and participate in PQT.
- (U) ($100) Continue to conduct preparations necessary to perform as an ISEA for Javelin.
- (U) ($111) Continue to monitor and participate in the P3I program.
- (U) ($95) Participate in development and integration of software upgrades.
- (U) ($30) Complete Milestone III documentation for the MCADM and enter full rate production.

000379

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603635M PROGRAM ELEMENT TITLE: Marine Corps Ground Combat/ Supporting Arms Systems PROJECT NUMBER: C1964 PROJECT TITLE: Joint Anti-Armor Weapon System (JAAWS)/Javelin

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996 President's Budget:	171	498	498
(U) Adjustments from FY 1996 PRESBUD:	0	-13	-35
(U) FY 1997 President's Budget Submit:	171	485	463

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY 1996 decrease of $13 due to undistributed Congressional reductions and revised economic adjustment.

(U) FY 1997 decrease due to revised economic adjustments.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603635M PROGRAM ELEMENT TITLE: Marine Corps Ground Combat/ Supporting Arms Systems PROJECT NUMBER: C1964 PROJECT TITLE: Joint Anti-Armor Weapon System (JAAWS)/Javelin

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

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

	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
(U) PMC Line 26 (BLI# 301100) Javelin	0	0	28,214	77,325	119,223	114,076	100,666	CONT.	CONT.

(U) RELATED RDT&E:

(U) PE 0604611A (Javelin)

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603635M
PROGRAM ELEMENT TITLE: Marine Corps Ground Combat/ Supporting Arms Systems

PROJECT NUMBER: C1964
PROJECT TITLE: Joint Anti-Armor Weapon System (JAAWS)/Javelin

D. (U) SCHEDULE PROFILE:

	FY 1995	FY 1996	FY 1997	TO COMPLETE
Program Milestones			3Q MS III	4Q FY99 IOC
Engineering Milestones			4Q SOFTWARE UPGRADES	
T&E Milestones	4Q JOINT LIVEFIRE PQT	3Q LIMITED USER TEST		
Contract Milestones			3Q FRP	

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603635M PROGRAM ELEMENT TITLE: Marine Corps Ground Combat/ Supporting Arms Systems PROJECT NUMBER: C1964 PROJECT TITLE: Joint Anti-Armor Weapon System (JAAWS)/Javelin

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

Project Cost Categories	FY 1995	FY 1996	FY 1997
a. Program Documentation/ Management Support	0	120	100
b. Other Program Support	41	65	85
c. Government Engineering Support	130	3002	278
Total	171	4857	463

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

C. (U) FUNDING PROFILE: Not applicable.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603635M
PROGRAM ELEMENT TITLE: Marine Corps Ground Combat/Supporting Arms Systems

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
C2112 Lightweight 155 Millimeter (MM) Howitzer (LW155)	6,361	14,607	11,205	30,227	29,877	14,012	9,410	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The LW155 is the replacement for the aging, operationally deficient M198 155mm Howitzer for both the Marine Corps and the Army. The LW155 will weigh 9,000 pounds, (approximately one-half the weight of its predecessor) and will offer significant strategic and tactical mobility improvements. The LW155 program is a cooperative joint program. The Joint Operational Requirements Document (JORD) was approved by the Assistant Commandant of the Marine Corps on 27 June 1995. The document was validated and approved by the Army on 29 September 1995. A MS I/II MCPDM was approved on 23 January 1996.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS:

- (U) ($4,311) Completed evaluation of existing LW155 Howitzer prototypes. Evaluated advanced fire control and other provisional technology for improvements in the tactical mobility and operational effectiveness of Towed Artillery Systems.
- (U) ($250) Confirmed operational requirements.
- (U) ($1,300) Provided test data to proceed with further development and acquisition of a LW155 Howitzer.
- (U) ($500) Completed program documentation to support the Milestone I/II decision.

2. (U) FY 1996 PLAN:

- (U) ($4,030) Conduct component technology and prototype evaluation/testing.
- (U) ($7,279) Conduct system development.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603635M PROGRAM ELEMENT TITLE: Marine Corps Ground Combat/ Supporting Arms Systems PROJECT NUMBER: C2112 PROJECT TITLE: Lightweight 155 Millimeter Howitzer (LW155)

- (U) ($800) Conduct Source Selection Board of prototype test participants.
- (U) ($2,300) Provide government support and management.
- (U) ($198) Portion of program reserved for Small Business Innovation Research assessment in accordance with 15 U.S.C. 638(F)(1).

3. (U) FY 1997 PLAN:

- (U) ($1,900) Conduct manufacturing planning utilizing government support and management.
- (U) ($1,305) Continue system development efforts.
- (U) ($7,000) Initiate contract to begin development of selected system.
- (U) ($700) Continue component technology and prototype evaluation.
- (U) ($300) Complete Source Selection Evaluation Board.

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996 President's Budget:	6,361	10,881	11,543
(U) Adjustments from FY 1996 PRESBUD:	0	+3,726	-338
(U) FY 1997 President's Budget Submit:	6,361	14,607	11,205

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603635M

PROGRAM ELEMENT TITLE: Marine Corps Ground Combat/ Supporting Arms Systems

PROJECT NUMBER: C2112

PROJECT TITLE: Lightweight 155 Millimeter Howitzer (LW155)

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1996 adjustments are due to a $4.2 million Congressional plus up and undistributed Congressional reductions for University Research and revised economic reductions.

(U) FY 1997 decrease is due to revised economic adjustments.

(U) Schedule: As the schedule was refined, test article manufacturing was extended to complete in FY 1999 vice FY 1998.

(U) Technical: Not applicable.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603635M PROGRAM ELEMENT TITLE: Marine Corps Ground Combat/ Supporting Arms Systems PROJECT NUMBER: C2112 PROJECT TITLE: Lightweight 155 Millimeter Howitzer (LW155)

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

	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
(U) PMC (BLI# 218500) 155mm Lightweight Towed Howitzer	0	0	0	0	0	139,739	141,521	CONT.	CONT.

(U) RELATED RDT&E: PE 0603004A (Weapons and Munitions Advanced Technology)

D. (U) SCHEDULE PROFILE:

	FY 1995	FY 1996	FY 1997	TO COMPLETE
Program Milestones		2Q MS I/II		2Q FY00 MS III
Engineering Milestones				FY 98/99 PDR/CDR FY99 PRR*
T&E Milestones		3Q DT/OT I		3Q FY99 IOT&E
Contract Milestones			2Q EMD ** FY 97 TEST ARTICLE MANUFACTURING	

* PRR - Production Readiness Review
** EMD - Engineering and Manufacturing Development

000387

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603635M
PROGRAM ELEMENT TITLE: Marine Corps Ground Combat/ Supporting Arms Systems

PROJECT NUMBER: C2112
PROJECT TITLE: Lightweight 155 Millimeter Howitzer (LW155)

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

Project Cost Categories	FY 1995	FY 1996	FY 1997
a. Primary Hardware Development	0	3,479	7,112
b. Development Test and Evaluation	4,641	4,500	0
c. Operational Test and Evaluation	0	300	0
d. Miscellaneous Test and Evaluation	0	900	43
e. Government Engineering Support	1,200	4,110	3,000
f. Program Management Support	520	898	1,050
Total	6,361	14,607	11,205

000388

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603635M PROGRAM ELEMENT TITLE: Marine Corps Ground Combat/ Supporting Arms Systems PROJECT NUMBER: C2112 PROJECT TITLE: Lightweight 155 Millimeter Howitzer (LW155)

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 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Product Development										
TBD	C/FPIF	MAY 96			0	0	1,500	7,000	CONT.	CONT.
ARDEC, Picatinny, NJ	MIPR	OCT 96			0	0	1,200	1,200	CONT.	CONT.
MISC Government Accounts	MIPR	VARIOUS			0	0	5,309	1,912	CONT.	CONT.
TOTAL PRODUCT AND DEVELOPMENT					**0**	**0**	**8,009**	**10,112**	**CONT.**	**CONT.**
Support and Management										
ARDEC, Picatinny, NJ	MIPR	OCT 96			3,000	1,720	898	1,050	CONT.	CONT.
Total Support and Management					**3,000**	**1,720**	**898**	**1,050**	**CONT.**	**CONT.**

000389

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603635M PROGRAM ELEMENT TITLE: Marine Corps Ground Combat/ Supporting Arms Systems PROJECT NUMBER: C2112 PROJECT TITLE: Lightweight 155 Millimeter Howitzer (LW155)

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 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Test and Evaluation										
ARDEC, Picatinny, NJ (SSEB)	MIPR	OCT 96	3,124	3,124	0	3,124	701	0	0	3,124
Misc Government Activities	MIPR	VARIOUS	0	0	0	0	3,219	43	0	0
ARL, Aberdeen, MD	APR 94/JUL 95		0	0	3,830	1,517	0	0	CONT.	CONT.
Yuma Proving Ground, Yuma AZ (Shoot Off)	MIPR	FEB 96	0	0	0	0	1,530	0	0	0
Yuma Proving Ground, Yuma AZ (LM Prototype)	MIPR	FEB 96	0	0	0	0	250	0	0	0
Total Test and Evaluation			3,124	3,124	3,830	4,641	4,500	43	CONT.	CONT.

GOVERNMENT FURNISHED PROPERTY: Not applicable.

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4
PROGRAM ELEMENT: 0603635M
PROGRAM ELEMENT TITLE: Marine Corps Ground Combat/ Supporting Arms Systems
PROJECT NUMBER: C2112
PROJECT TITLE: Lightweight 155 Millimeter Howitzer (LW155)

	Total FY 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Subtotal Product Development	0	0	8,009	10,112	CONT.	CONT.
Subtotal Support and Management	3,000	1,720	898	1,050	CONT.	CONT.
Subtotal Test and Evaluation	3,830	4,641	5,700	43	CONT.	CONT.
Total Project	6,830	6,361	14,607	11,205	CONT.	CONT.

C. (U) FUNDING PROFILE: Not applicable.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603635M
PROGRAM ELEMENT TITLE: Marine Corps Ground Combat/Supporting Arms Systems

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
C2113 Short Range Anti-Armor Weapon (SRAW)/Predator	17,340	30,545	32,257	457	0	0	0	0	121,044

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: SRAW/Predator will provide the Marine Corps with a lethal, disposable, fire and forget, top-attack, soft launch for firing from enclosed spaces, accurate, night vision capable, lightweight, main battle tank killer. Modularity of the system will allow development of optimal warheads (flame, bunker-busting, multi-purpose) to fit on the flight module.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS:

- (U) ($8,000) Finalized design and fabricated Engineering Design Models (EDMs).
- (U) ($5,340) Continued EMD phase of program.
- (U) ($4,000) Conducted flight tests of EDMs.

2. (U) FY 1996 PLAN:

- (U) ($22,927) Continue EMD phase of program and conduct Critical Design Review (CDR).
- (U) ($3,500) Begin Developmental Test (DT).
- (U) ($3,500) Build test models.
- (U) ($618) Portion of program reserved for Small Business Innovation Research (SBIR) assessment in accordance with 15 U.S.C. 638(f)(1).

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603635M PROGRAM ELEMENT TITLE: Marine Corps Ground Combat/ Supporting Arms Systems PROJECT NUMBER: C2113 PROJECT TITLE: Short Range Anti-Armor Weapon (SRAW)/Predator

3. (U) FY 1997 PLAN:

- (U) ($26,928) Continue EMD phase of program.
- (U) ($2,629) Begin Operational Test (OT).
- (U) ($2,700) Complete DT.

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996 President's Budget:	14,041	31,535	33,408
(U) Adjustments from FY 1996 PRESBUD:	+3,299	-990	-1,151
(U) FY 1997 President's Budget Submit:	17,340	30,545	32,257

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding:

(U) Congress appropriated an additional $6,000 in FY 1995 funds. Due to this delay in the release of funds, the Engineering and Manufacturing Development (EMD) phase of the program completes in FY 1998 vice FY 1997. The additional FY 1995 funds were used to continue the EMD by providing materials, subcontracting support, as well as primary hardware/product development support.

(U) Furthermore, FY 1995 funding was recently increased. The additional $4,000 will be used to further accelerate the SRAW Engineering and Manufacturing Development phase in accordance with Congressional guidance.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603635M PROGRAM ELEMENT TITLE: Marine Corps Ground Combat/ Supporting Arms Systems PROJECT NUMBER: C2113 PROJECT TITLE: Short Range Anti-Armor Weapon (SRAW)/Predator

(U) The FY 1996 decrease of $990 is due to undistributed Congressional reductions for University Research and economic adjustments.

(U) The FY 1997 decrease is due to revised economic adjustments.

(U) Schedule: EMD completes in 1st quarter FY 1998 vice FY 1997.

(U) Technical: Not applicable.

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

	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
(U) PMC Line 16 (BLI# 147100) Rockets, All Types (SRAW portion only)	0	0	0	0	30,000	75,000	64,000	CONT.	CONT.

(U) RELATED RDT&E: PE 0603313A (Missile and Rocket Advanced Technology)

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603635M PROGRAM ELEMENT TITLE: Marine Corps Ground Combat/ Supporting Arms Systems PROJECT NUMBER: C2113 PROJECT TITLE: Short Range Anti-Armor Weapon (SRAW)/Predator

D. (U) SCHEDULE PROFILE:

	FY 1995	FY 1996	FY 1997	TO COMPLETE
Program Milestones				1Q FY98 MS III
Engineering Milestones		2Q CDR		
T&E Milestones		DT I	OT I/II DT II	
Contract Milestones				

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603635M

PROGRAM ELEMENT TITLE: Marine Corps Ground Combat/ Supporting Arms Systems

PROJECT NUMBER: C2113

PROJECT TITLE: Short Range Anti-Armor Weapon (SRAW)/Predator

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

Project Cost Categories	FY 1995	FY 1996	FY 1997
a. Primary Hardware Development	**1,814**	**3,269**	**276**
Airframe and Launcher	700	1,400	156
Electronics	700	1,600	120
Propulsion and Ordnance	400	269	0
System Integration	14	0	0
b. Materials and Subcontracting	**11,121**	**7,660**	**8,196**
c. Test Evaluation and Equipment in Support of Product Development	**600**	**4,020**	**4,800**
Support Equipment	440	800	455
Development Tests	160	0	0
Qualification Tests	0	3,220	3,776
Government Support	0	0	569
d. Production Support	**250**	**6,670**	**7,022**
Engineering Support	50	120	100
First Article Inspection and Test	0	2,410	2,737
Manufacturing and Process Engineering	200	4,140	4,185
e. Program Support	**220**	**2,850**	**2,964**
Quality Assurance	70	1,150	1,126
Procurement	60	960	902
Integrated Logistics Support	90	740	936
f. System Engineering	**150**	**1,100**	**1,297**
g. Project/Technical Management	**185**	**2,340**	**2,342**
h. Program Manager/In-house	**3,000**	**2,636**	**2,660**
i. Operational Testing	**0**	**0**	**2,700**
Total	**17,340**	**30,545**	**32,257**

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603635M PROGRAM ELEMENT TITLE: Marine Corps Ground Combat/ Supporting Arms Systems PROJECT NUMBER: C2113 PROJECT TITLE: Short Range Anti-Armor Weapon (SRAW)/Predator

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 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Product Development: Basic Technology Initiative (BTI) funded the prime contract/contractor (LORAL) through FY 1992.										
LORAL, Newport Beach, CA	SS/CPIF	2 JUN 94	96,317	96,317	23,666	14,698	27,905	29,597	325	96,317
Total Product Development			**96,317**	**96,317**	**23,666**	**14,698**	**27,905**	**29,597**	**325**	**96,317**
Support and Management										
NSWC, Dahlgren, VA	WR	1 OCT 96	14,337	14,337	6,720	2,500	2,500	2,500	117	14,337
Miscellaneous	VARIOUS	VARIOUS	1,068	1,068	611	142	140	160	15	1,068
Total Support and Management			**15,405**	**15,405**	**7,331**	**2,642**	**2,640**	**2,660**	**132**	**15,405**

Test and Evaluation: Not applicable.

GOVERNMENT FURNISHED PROPERTY: Not applicable.

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603635M
PROGRAM ELEMENT TITLE: Marine Corps Ground Combat/ Supporting Arms Systems

PROJECT NUMBER: C2113
PROJECT TITLE: Short Range Anti-Armor Weapon (SRAW)/Predator

	Total FY 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Subtotal Product Development	31,727	14,698	27,905	29,597	325	104,252
Subtotal Support and Management	7,331	2,642	2,640	2,660	132	15,405
Subtotal Test and Evaluation	0	0	0	0	0	0
Total Project	39,058	17,340	30,545	32,257	457	119,657

C. (U) FUNDING PROFILE: Not applicable.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603635M
PROGRAM ELEMENT TITLE: Marine Corps Ground Combat/Supporting Arms Systems

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
C2250 Team Target Engagement Simulator (TTES)	0	0	966	961	0	0	0	0	1,927

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project was formerly titled Team Tactical Engagement Simulator (TTES). The purpose of this project is to complete development of a revolutionary next generation training device for individual and small unit close combat training employing advanced modeling and simulation technology. Trainees will be immersed in virtual environments where they will conduct force-on-force engagements against computer generated hostiles on synthetic battlefields that can be populated with neutrals. The technology will be ruggedized for use in expeditionary and shipboard settings.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS: Funding ($2,005) was contained in PE 0603640M, Project C2223.

2. (U) FY 1996 PLAN: Funding ($1,000) is contained in PE 0603640M, Project C2223.

3. (U) FY 1997 PLAN: Efforts are funded in two PEs: $1,000 is funded in PE 0603640M, Project C2223 and $966 is funded in this PE. The following effort is funded in this PE.

   - (U) ($966) Build an Advanced Developmental Model (ADM) that meets the criteria for expeditionary operations and the employment of all infantry weapons in the conduct of realistic tactical operations in a synthetic environment.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603635M PROGRAM ELEMENT TITLE: Marine Corps Ground Combat/ Supporting Arms Systems PROJECT NUMBER: C2250 PROJECT TITLE: Team Tactical Engagement Simulator (TTES)

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996 President's Budget:	0	0	995
(U) Adjustments from FY 1996 PRESBUD:	0	0	-29
(U) FY 1997 President's Budget Submit:	0	0	966

(U) CHANGE SUMMARY EXPLANATION: FY 1997 decrease due to undistributed Congressional reductions and DBOF adjustments.

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

(U) RELATED RDT&E:

(U) PE 0603640M (Marine Corps Advanced Technology Demonstrations)
(U) PE 0604657M (Marine Corps Ground Combat/Supporting Arms Systems (Engineering and Manufacturing Development))

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603635M
PROGRAM ELEMENT TITLE: Marine Corps Ground Combat/ Supporting Arms Systems

PROJECT NUMBER: C2250
PROJECT TITLE: Team Tactical Engagement Simulator (TTES)

D. (U) SCHEDULE PROFILE:

	FY 1995	FY 1996	FY 1997	TO COMPLETE
Program Milestones				
Engineering Milestones			4Q BUILD ADM	
T&E Milestones				2Q FY98 DT I 3Q FY98 OT I
Contract Milestones				

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603635M
PROGRAM ELEMENT TITLE: Marine Corps Ground Combat/ Supporting Arms Systems

PROJECT NUMBER: C2250
PROJECT TITLE: Team Tactical Engagement Simulator (TTES)

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

Project Cost Categories	FY 1995	FY 1996	FY 1997
a. Program Development	0	0	966
Total	0	0	966

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 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Product Development										
TBD	TBD	2ND QTR	TBD	1,661	0	0	0	966	961	1,927

Support and Management: Not applicable.

Test and Evaluation: Not applicable.

GOVERNMENT FURNISHED PROPERTY: Not applicable.

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603635M PROGRAM ELEMENT TITLE: Marine Corps Ground Combat/ Supporting Arms Systems PROJECT NUMBER: C2250 PROJECT TITLE: Team Tactical Engagement Simulator (TTES)

	Total FY 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Subtotal Product Development	0	0	0	966	695	1,661
Subtotal Support and Management	0	0	0	0	0	0
Subtotal Test and Evaluation	0	0	0	0	300	300
Total Project	[1]0	[2]0	[3]0	[4]966	[5]961	1,927

1 This program began in FY 1993. FY 1994 funding ($1,714) was contained in PE 0603640M, Marine Corps ATD, Project C2080, Weaponry.

2 FY 1995 funding ($2,005) is contained in PE 0603640M, Project C2223.

3 FY 1996 funding ($1,000) is contained in PE 0603640M, Project C2223.

4 Additional FY 1997 efforts ($1,000) are funded in PE 0603640M, Project C2223.

5 FY 1999 through FY 2001 funding is contained in PE 0604657M, Marine Corps Ground Combat/Supporting Arms Systems, Project C2253, TTES.

C. (U) FUNDING PROFILE: Not applicable.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603654N
PROGRAM ELEMENT TITLE: Joint Service Explosive Ordnance Disposal Development

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
Q0377 Joint Service Explosive Ordnance Disposal System	5,851	4,654	2,370	5,109	6,208	6,208	6,354	CONT.	CONT.
Q1317 Explosive Ordnance Disposal Diving Systems	2,511	2,418	2,269	2,304	2,669	2,663	2,723	CONT.	CONT.
TOTAL	8,362	7,072	4,639	7,413	8,877	8,871	9,077	CONT.	CONT.

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This is a Joint Service Program. This program provides for the development of Explosive Ordnance Disposal tools and equipment for use by all military services. The responsibility is assigned to the Navy as single service manager, by Department of Defense Directive 5160.62 of 26 April 1989, for management of the Joint Service Explosive Ordnance Disposal Research and Development Program. Increasing types of foreign and domestic weapons necessitate a continuing development program to provide Explosive Ordnance Disposal personnel of all military services with the special equipment and tools required to support this mission. This program also provides life support related equipment necessary to support the performance of Navy Explosive Ordnance Disposal tasks underwater. This equipment must have inherently low acoustic and magnetic signatures in order to allow the Explosive Ordnance Disposal technician to safely approach, render safe and dispose of sea mines and other underwater ordnance.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under DEMONSTRATION & VALIDATION because it develops and integrates hardware for experimental test related to specific ship or aircraft applications.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603654N
PROGRAM ELEMENT TITLE: Joint Service Explosive Ordnance Disposal Development

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
Q0377 Joint Service Explosive Ordnance Disposal System	5,851	4,654	2,370	5,109	6,208	6,208	6,354	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: Provides Explosive Ordnance personnel of all military services with the specialized equipment and tools required to support their mission of detection, location, identification, rendering safe, recovery, field and laboratory evaluation, and final disposal of nuclear, conventional, chemical, and biological munitions, including improvised explosive devices.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS:

- (U) ($3,801) Continued Development on the Remote Ordnance Neutralization System (RONS) and MODS projects. ($467) forward finance for FY96 requirements due to poor execution.
- (U) ($900) Initiated DT-IA testing on Lightweight Disposable Disrupter (LIDD) project.
- (U) ($950) Initiated Recoilless Dearmer, formerly Explosively Actuated Tools, and Advanced Radiographic System (ARS) projects.
- (U) ($200) Obtained Milestone III decision for Remote Controlled Reconnaissance Monitor (RECORM). ($200) forward finance for FY96 requirements due to poor execution.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603654N PROJECT NUMBER: Q0377
PROGRAM ELEMENT TITLE: Joint Service Explosive Ordnance Disposal Development PROJECT TITLE: Joint Service Explosive Ordnance Disposal System

2. (U) FY 1996 PLAN:

- (U) ($800) Initiate Main Charge Disrupter (MCD), formerly Remote Firing Device.
- (U) ($778) Complete critical design review on MODS project. ($667) Forward finance for FY97 requirements due to poor execution.
- (U) ($1,137) Obtain Milestone II for RONS project and initiate the Classified Project.
- (U) ($1,875) Obtain Milestone I decision for LIDD and Milestone I/II decision for ARS project.
- (U) ($64) Portion of extramural program reserved for Small Business Innovative Research assessment in accordance with 15 U.S.C.638.

3. (U) FY 1997 PLAN:

- (U) ($1,086) Initiate DT-II on ARS project.
- (U) ($1,184) Initiate DT-IB on LIDD and DT-IA on MCD projects.
- (U) ($100) Initiate Improved Ordnance Locator (IOL) project.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603654N PROJECT NUMBER: Q0377
PROGRAM ELEMENT TITLE: Joint Service Explosive Ordnance Disposal Development PROJECT TITLE: Joint Service Explosive Ordnance Disposal System

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996 President's Budget:	5,851	4,803	4,653
(U) Adjustments from PRESBUDG:	0	-149	-2,283
(U) FY 1997 PRESBUDG Submit:	5,851	4,654	2,370

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 96 - Congressional undistributed general and inflation reductions. FY 97 - -$1,500 to support FY 1997 Mine Warfare Campaign Plan. Revised inflation estimates and other minor pricing adjustments -$783.

(U) Schedule: FY 97-RONS - Milestone II slip from 2Q/95 to 2Q/96 due to the delivery of the RONS Advanced Development Model (ADM) contractor slipped 10 months.

(U) Technical: RONS- ADM delivery slipped due to technical difficulties encountered during the integration of the subsystems.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET | DATE: March 1996

BUDGET ACTIVITY: 4 | PROGRAM ELEMENT: 0603654N | PROGRAM ELEMENT TITLE: Joint Service Explosive Ordnance Disposal Development | PROJECT NUMBER: Q0377 | PROJECT TITLE: Joint Service Explosive Ordnance Disposal System

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

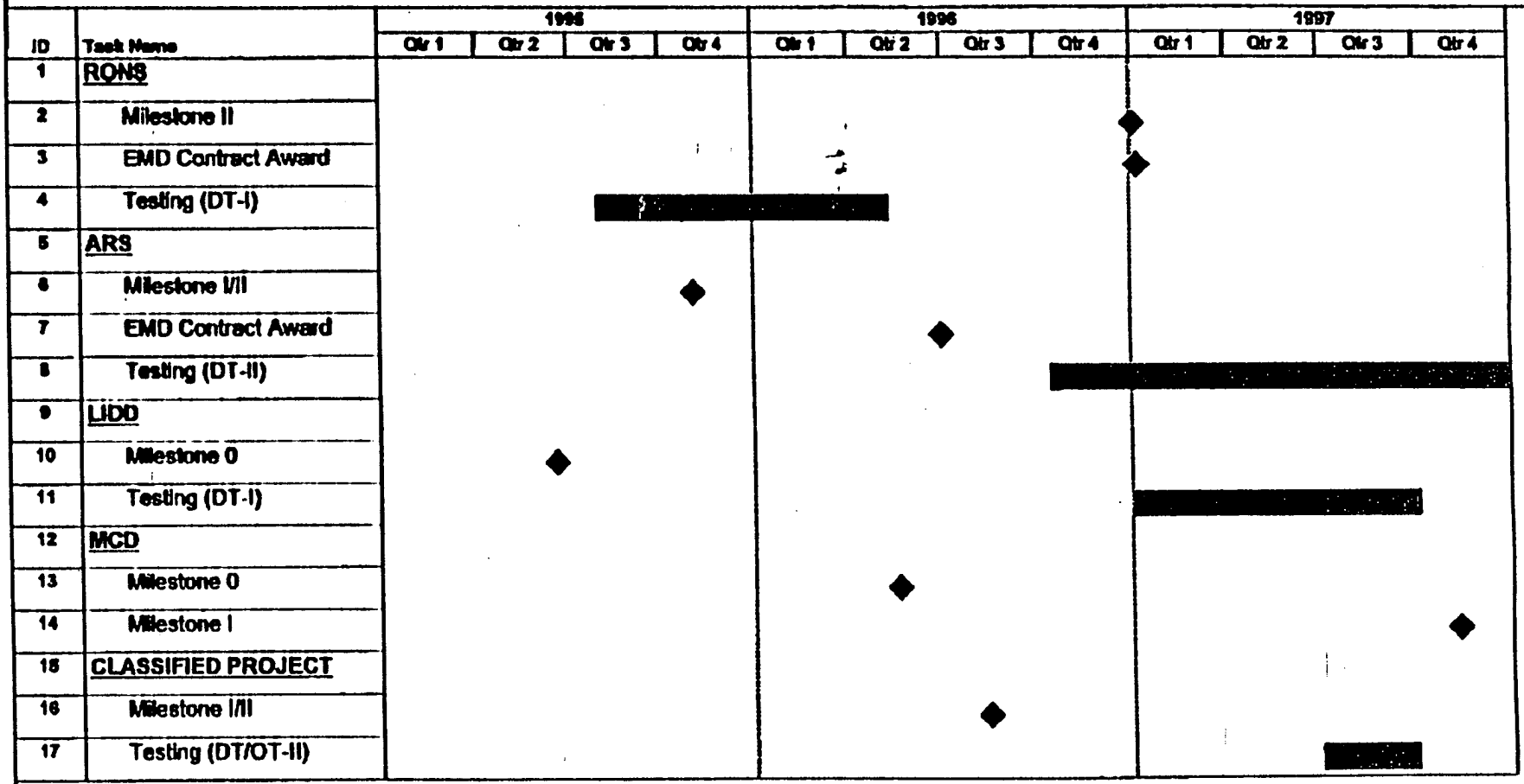
	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
(U) OPN Line 550900 (portion)	0	0	0	0	1,200	2,320	2,100	CONT.	CONT.

(U) RELATED RDT&E:

(U) PE 0602315N (MCM, Mining & Special Warfare Technology) Provides for the development of new technologies which show promise and the transition to advanced development.
(U) PE 0604654N (Joint Service Explosive Ordnance Disposal Development) Provides for the integration of specialized tools and equipment into specified procedures required for individual weapons and ordnance items.

D. (U) SCHEDULE PROFILE: See Attached.

RDT&E MILESTONE CHARTS
P.E.: 0603654N/Q0377



ID	Task Name
1	RONS
2	Milestone II
3	EMD Contract Award
4	Testing (DT-I)
5	ARS
6	Milestone I/II
7	EMD Contract Award
8	Testing (DT-II)
9	LIDD
10	Milestone 0
11	Testing (DT-I)
12	MCD
13	Milestone 0
14	Milestone I
15	CLASSIFIED PROJECT
16	Milestone I/II
17	Testing (DT/OT-II)

JOINT SERVICE
EXPLOSIVE ORDNANCE DISPOSA
EQUIPMENT

Task — Summary — Rolled Up Progress
Progress — Rolled Up Task
Milestone — Rolled Up Milestone

Page 1

000409

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603654N
PROGRAM ELEMENT TITLE: Joint Service Explosive Ordnance Disposal Development

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
Q1317 Explosive Ordnance Disposal Diving Systems	2,511	2,418	2,269	2,304	2,669	2,663	2,723	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: Provides for development of diving equipment and explosive charges to support Explosive Ordnance Disposal (EOD) underwater operation. The equipment must have inherently low acoustic and magnetic signatures in order to allow the EOD technician to safely approach, render safe, and dispose of sea mines and other underwater ordnance.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS:

- (U) ($1,109) Continued developing equipment which improves diver capability and endurance.
- (U) ($449) Continued developing a non-magnetic underwater lift system.
- (U) ($725) Continued developing a non-magnetic acoustic firing device.
- (U) ($228) Conducted Operational Evaluation (OPEVAL) of the MK 98 Neutralization Charge.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603654N PROJECT NUMBER: Q1317
PROGRAM ELEMENT TITLE: Joint Service Explosive Ordnance Disposal Development PROJECT TITLE: Explosive Ordnance Disposal Diving Systems

2. (U) FY 1996 PLAN:

- (U) ($1,376) Continue developing equipment which improves diver capability and endurance.
- (U) ($504) Continue developing a non-magnetic underwater lift system.
- (U) ($515) Continue developing a non-magnetic acoustic firing device.
- (U) ($23) Portion of extramural program reserved for Small Business Innovative Research assessment in accordance with 15 U.S.C.638.

3. (U) FY 1997 PLAN:

- (U) ($1,704) Continue developing equipment which improves diver capability and endurance.
- (U) ($565) Continue developing a non-magnetic acoustic firing device.

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996 President's Budget:	2,511	2,495	2,367
(U) Adjustments from PRESBUDG:	0	-77	-98
(U) FY 1997 PRESBUDG Submit:	2,511	2,418	2,269

000411

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603654N
PROGRAM ELEMENT TITLE: Joint Service Explosive Ordnance Disposal Development

PROJECT NUMBER: Q1317
PROJECT TITLE: Explosive Ordnance Disposal Diving Systems

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 96 - Congressional undistributed general and inflation reductions. FY97 - Revised inflation estimates and other minor pricing adjustments -$98.

(U) Schedule: Delayed Milestone 0 for Underwater equipment to detect objects in water column one year. Technology will not be ready to transition from 6.3 effort in FY 97.
MK 98 Neutralization Charge Milestone III slipped 3 months due to the delay in production of the EDMs to support operational test.

(U) Technical: Not applicable.

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

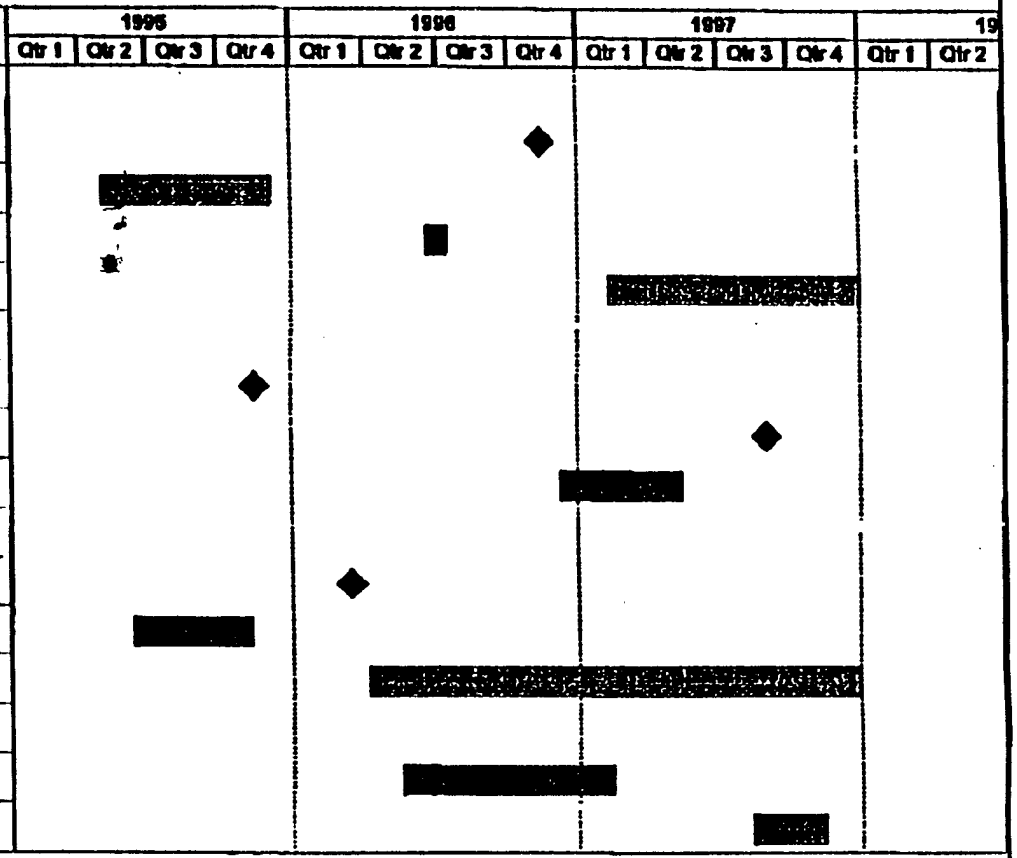
	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
(U) OPN Line 114000 (portion)	2,052	1,117	0	2,753	4,123	3,937	2,236	CONT.	CONT.

(U) RELATED RDT&E: Not applicable.

D. (U) SCHEDULE PROFILE: See Attached.

RDT&E MILESTONE CHART
P.E.: 0603654N/Q1317

ID	Task Name
1	**LIFT SYSTEM**
2	Milestone III
3	Testing (DT-II)
4	Testing (OT-II)
5	Production
6	**ACOUSTIC FIRING DEVICE**
7	Milestone 0
8	Milestone I/II
9	Testing (DT-I)
10	**MK 98 NEUTRALIZATION CHARGE**
11	Milestone III
12	Testing (DT-II)
13	Production
14	**IMPROVING DIVER CAPABILITY**
15	Developmental Testing
16	Operational Testing



EXPLOSIVE ORDNANCE DISPOSA
DIVING SYSTEMS

Task
Progress
Milestone
Summary
Rolled Up Task
Rolled Up Milestone
Rolled Up Progress

Page 1

000413

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603711N
PROGRAM ELEMENT TITLE: Fleet Tactical Development

(U) COST: (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
R0138 Tactical Development Support	4,573	4,122	3,398	3,418	4,175	4,175	4,275	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This program element provides for the development of capabilities to support the evaluation of existing tactics, techniques, and procedures by pulling together information from various Fleet systems/sources and generating consolidated analysis products that provide an integrated Blue Force/Operating Force (OPFOR) tactical picture. This program element funds the development of automated tools to capture various data components, development of tools to analyze and display this data, training for battle groups (BGs) to utilize the data collection and assessment tools, and analytical support for Fleet and BG commanders to compile, analyze, and present post exercise/operation feedback reports and lessons learned.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under DEMONSTRATION & VALIDATION because it develops and integrates hardware for experimental test related to specific ship or aircraft applications.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS:
   - (U) ($2,483) Development: Began development of a real-time data acquisition front end processor for Shipboard Tactical Information Management System (STIMS). Enhanced event/engagement summary products and provided new data visualization capabilities including distributed debriefing capability, link net cycle time, and identification versus defense zone penetration products. Responded to Fleet requests to enhance the STIMS user interface and simplify processes to support use of STIMS by Fleet personnel while forward deployed. Incorporated Global Positioning System ground truth track data for OPFOR units into STIMS assessment capability in near real-time. Investigated acquisition of data from existing and emerging tactical and command and control systems.
   - (U) ($2,090) Evaluation: Provided evaluation support (assessment tool requirements determination and validation, evaluation of assessment tool suitability, data analysis and presentation, and support to Fleet

determination/documentation of lessons learned) for Intermediate and Advanced Phase Training (ITA, COMPUTEX, JTFEX) for seven CV/CVN Battle Group exercises. Also included support for two Modeling/Simulation (Battle Force Tactical Training) exercises. Provided evaluation support and STIMS training to forward deployed Battle Group staffs for seven CV/CVN Battle Groups. Provided reconstruction and evaluation support for three CINCLANTFLT/CINCPACFLT operations (Tandem Thrust, Team Spirit, and Ocean Venture) and CINCUSNAVEUR Combined and bi-lateral exercises (Display Determination, Distant Thunder, Dragon Hammer), and Bosnia/Adriatic operations.

2. (U) FY 1996 PLAN:

- (U) ($2,110) Development: Research requirements for Quantitative Measures products to support COMSECONDFLT Senior Officer Observer Team and initiatives. Complete and test real-time data acquisition front end processor for STIMS. Develop LINK-11 track segment correlation capability to create a single composite track for each track number from reports by multiple participating units. Develop a sonobuoy/mine field generator to enable rapid visualization of fields reported by message. Research modeling and simulation messages as a source of data for assessment. Enhance data replay with replay speed change and time jump scripts. Enhance ability to rapidly interpret tactical situation plots by use of unit class silhouettes. Select tracks for display based on the occurrence of user specified tactical actions. Investigate acquisition of data from existing and emerging tactical and command and control systems.
- (U) ($1,918) Evaluation: Provide evaluation support (assessment tool requirements determination and validation, evaluation of assessment tool suitability, data analysis and presentation, and support to Fleet determination/documentation of lessons learned) for Intermediate and Advanced Phase Training (ITA, COMPUTEX, JTFEX) for seven CV/CVN Battle Group exercises. Provide evaluation support and STIMS training to forward deployed Battle Group staffs for seven CV/CVN Battle Groups. Provide reconstruction and evaluation support for five CINCLANTFLT/CINCPACFLT operations (RIMPAC, Tandem Thrust, Team Spirit, Solid Stance, and Ocean Venture) and CINCUSNAVEUR Combined and bi-lateral exercises (Display Determination, Distant Thunder, Dragon Hammer, Dynamic Guard, and real world operations).
- (U) ($94) Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15 U.S.C. 638.

3. (U) FY 1997 PLAN:

- (U) ($1,784) Development: Continue research and development of Quantitative Measures products to support COMSECONDFLT Senior Officer Observer Team initiatives and related CINCLANTFLT Government Performance Results Act initiatives. Provide on-screen track generation capability integrated with navigation spreadsheet. Enhance

event/engagement summaries and data visualization capabilities. Investigate acquisition of data from existing and emerging tactical and command and control systems.

- (U) ($1,614) Evaluation: Provide evaluation support (assessment tool requirements determination and validation, evaluation of assessment tool suitability, data analysis and presentation, and support to Fleet determination/documentation of lessons learned) for Intermediate and Advanced Phase Training (ITA, COMPUTEX, JTFEX) for five CV/CVN Battle Group exercises. Provide evaluation support and STIMS training to forward deployed Battle Group staffs for five CV/CVN Battle Groups. Provide reconstruction and evaluation support for three CINCLANTFLT/CINCPACFLT operations (Tandem Thrust, Team Spirit, and Ocean Venture) and CINCUSNAVEUR Combined and bilateral exercised (Display Determination, Distant Thunder, Dragon Hammer, Dynamic Guard, and real world operations).

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996 President's Budget:	4,573	4,268	3,505
(U) Adjustments from FY 1996 PRESBUDG:	0	-146	-107
(U) FY 1997 PRESBUDG Submit:	4,573	4,122	3,398

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1996 decrease is due to a reduction to program requirements (-14); Congressional undistributed general and inflation reductions (-80); and revised DOD inflation rates and other minor pricing adjustments (-52). FY 1997 funding reduction is due to a decrease in program requirements (-5); and revised DOD inflation estimates (-102).

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603711N PROJECT NUMBER: R0138
PROGRAM ELEMENT TITLE: Fleet Tactical Development PROJECT TITLE: Tactical Development Support

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

(U) RELATED RDT&E:
(U) PE 0605155N (Fleet Tactical Development and Evaluation)

D. (U) SCHEDULE PROFILE:

	FY 1995	FY 1996	FY 1997	TO COMPLETE
Development	Q2 Assessment Tools Software Update Release	Q2 Assessment Tools Software Update Release	Q2 Assessment Tools Software Update Release	CONT.
	Q4 Assessment Tools Software Update Release	Q4 Assessment Tools Software Update Release	Q4 Assessment Tools Software Update Release	CONT. CONT.
Evaluation	As scheduled by Fleet	As scheduled by Fleet	As scheduled by Fleet	CONT.

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603711N PROJECT NUMBER: R0138
PROGRAM ELEMENT TITLE: Fleet Tactical Development PROJECT TITLE: Tactical Development Support

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

Project Cost Categories	FY 1995	FY 1996	FY 1997
a. Development	2,483	2,110	1,784
b. Evaluation	2,090	1,918	1,614
c. SBIR	0	94	0
Total	4,573	4,122	3,398

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

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FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603713N
PROGRAM ELEMENT TITLE: Ocean Engineering Development

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
M0099 Deep Submergence Biomedical Development	5,622	4,982	3,883	4,858	5,590	5,584	5,719	CONT.	CONT.
S0394 Shallow Depth Diving Equipment	8,425	0	4,723	8,692	5,467	3,557	2,179	CONT.	CONT.
TOTAL	14,047	4,982	8,606	13,550	11,057	9,141	7,898	CONT.	CONT.

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: Developments in this program will enable the U.S. Navy to overcome deficiencies which constrain underwater operations in the areas of search, location, rescue, recovery, salvage, construction, and protection of offshore assets. This program develops medical technology, diver life support equipment, and the vehicles, systems, and tools to permit manned underwater operations.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under DEMONSTRATION & VALIDATION because it develops and integrates hardware for experimental test related to specific ship or aircraft applications.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603713N PROGRAM ELEMENT TITLE: Ocean Engineering Development PROJECT NUMBER: M0099 PROJECT TITLE: Deep Submergence Biomedical Development

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
M0099 Deep Submergence Biomedical Development	5,622	4,982	3,883	4,858	5,590	5,584	5,719	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: Develops biomedical technology to increase diver safety and effectiveness; supports deeper, longer, safer, more flexible dives. Requirements: NAPDD #007-02 Rev. 1, Deep Submergence Biomedical Development, 30 Jan 92.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS:

- (U) ($2,635) Assessed oxygen as a contributor to decompression risk. Provide accurate prediction of risk in diving strategies to decrease decompression time (100% breathing in water, surface decompression, multiple inert gas diving). Extend disabled submarine crew survival time.
- (U) ($1,376) Developed psychomotor tests to measure performance mission-specific scenarios.
- (U) ($1,611) Delivered diver hearing conservation program, develop a system to monitor health status of Navy divers, monitor air quality testing of divers' air, improve human performance during specific diving scenarios, develop recommendations on return to diving following decompression sickness injury, study analysis and control of contaminants in closed spaces.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603713N PROJECT NUMBER: M0099
PROGRAM ELEMENT TITLE: Ocean Engineering Development PROJECT TITLE: Deep Submergence Biomedical Development

2. (U) FY 1996 PLAN:

- (U) ($3,109) Develop strategies to accelerate decompression and manage recompression risk. Develop methods to detect susceptibility to central nervous system (CNS) decompression sickness and CNS oxygen toxicity, minimize decompression and oxygen toxicity for shallow water repetitive level diving, identify consequences of subclinical CNS decompression sickness, identify methods to prevent CNS oxygen toxicity, extend disabled submarine crew survival time.

- (U) ($1,164) Identify parameters that affect work performance in mission specific scenarios, characterize physiological parameters of underwater breathing apparatus.

- (U) ($682) Conduct longitudinal monitoring of health status of divers, study effects of diver hearing conservation program.

- (U) ($27) Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15 U.S.C. 638.

3. (U) FY 1997 PLAN:

- (U) ($2,369) Test strategies to accelerate decompression and manage decompression risk. extend capability during shallow water repetitive level diving, identify platform specific diving requirements, improve HeO2 "bounce dive" capability, define tables of pulmonary and CNS oxygen toxicity and identify methods to prevent CNS oxygen toxicity, extend disabled submarine crew survival time.

- (U) ($807) Develop strategies to improve performance in mission specific scenarios, identify response to changes in diving conditions (e.g., water temperature, visibility, current). deliver recommendations for use of physiological parameters in design of underwater breathing apparatus

- (U) ($707) Identify the long term effects of repeated exposure to high partial pressures of oxygen, develop improvements for the diver hearing conservation program.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603713N PROJECT NUMBER: M0099
PROGRAM ELEMENT TITLE: Ocean Engineering Development PROJECT TITLE: Deep Submergence Biomedical Development

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996 President's Budget:	5,722	5,166	5,267
(U) Adjustments from PRESBUDG:	-100	-184	-1,384
(U) FY 1997 PRESBUDG Submit:	5,622	4,982	3,883

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: The decrease in FY 95 results from a program adjustment (actual update). The FY 96 decrease is for Congressional Undistributed Reductions. The FY 97 decrease reflects a restructuring of the program and inflation savings.

(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 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603713N PROJECT NUMBER: S0394
PROGRAM ELEMENT TITLE: Ocean Engineering Development PROJECT TITLE: Shallow Depth Diving Equip

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
S0394 Shallow Depth Diving Equipment	8,425	0	4,723	8,692	5,467	3,557	2,179	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project is to develop systems to support conventional diver operations from surface platforms to depths of 300 feet. Diver operations include ship husbandry, salvage/recovery, and submarine rescue operations to support national, as well as, Navy needs around the world. Modern certifiable diving systems which ensure diver safety and allow maximum work efficiency will replace currently antiquated systems. All efforts are currently focused on the following submarine rescue systems:

(U) Submarine Rescue Diving and Recompression System (SRDRS) is to provide a new rapidly-deployed emergency submarine rescue system. SRDRS will fill the gap created by the decommissioning of USS PIGEON (ASR 21) and USS ORTOLAN (ASR 22). SRDRS is to include an air transportable rapid assessment sub-system and a recompression chamber sub-system. The SRDRS will provide a global rapid response capability to support submarine rescue missions.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603713N PROJECT NUMBER: S0394
PROGRAM ELEMENT TITLE: Ocean Engineering Development PROJECT TITLE: Shallow Depth Diving Equip

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS:

- (U) ($8,425) Submarine Rescue Diving and Recompression System: Completed system design of the rapid assessment sub-system, the recompression sub-system, and all sub-system components; completed testing of the gas reclaimer; completed evaluation and testing atmospheric diving suit.

2. (U) FY 1996 PLAN:

- (U) Not Applicable.

3. (U) FY 1997 PLAN:

- (U) ($4,723) Submarine Rescue Diving and Recompression System: Based on results of the FY 1995 testing and evaluation, complete detailed design and award contract for manufacture of prototype rapid assessment sub-system, begin detailed design of recompression sub-system.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603713N PROGRAM ELEMENT TITLE: Ocean Engineering Development PROJECT NUMBER: S0394 PROJECT TITLE: Shallow Depth Diving Equip

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996 President's Budget:	8,025	0	0
(U) Adjustments from PRESBUDG:	+400	0	+4,723
(U) FY 1997 PRESBUDG Submit:	8,425	0	4,723

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: The increase in FY 95 results from a Below Threshold Reprogramming to support PR 97 adjustment. Funding in FY 1997 was added for the Submarine Rescue Diving and Recompression System.

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

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

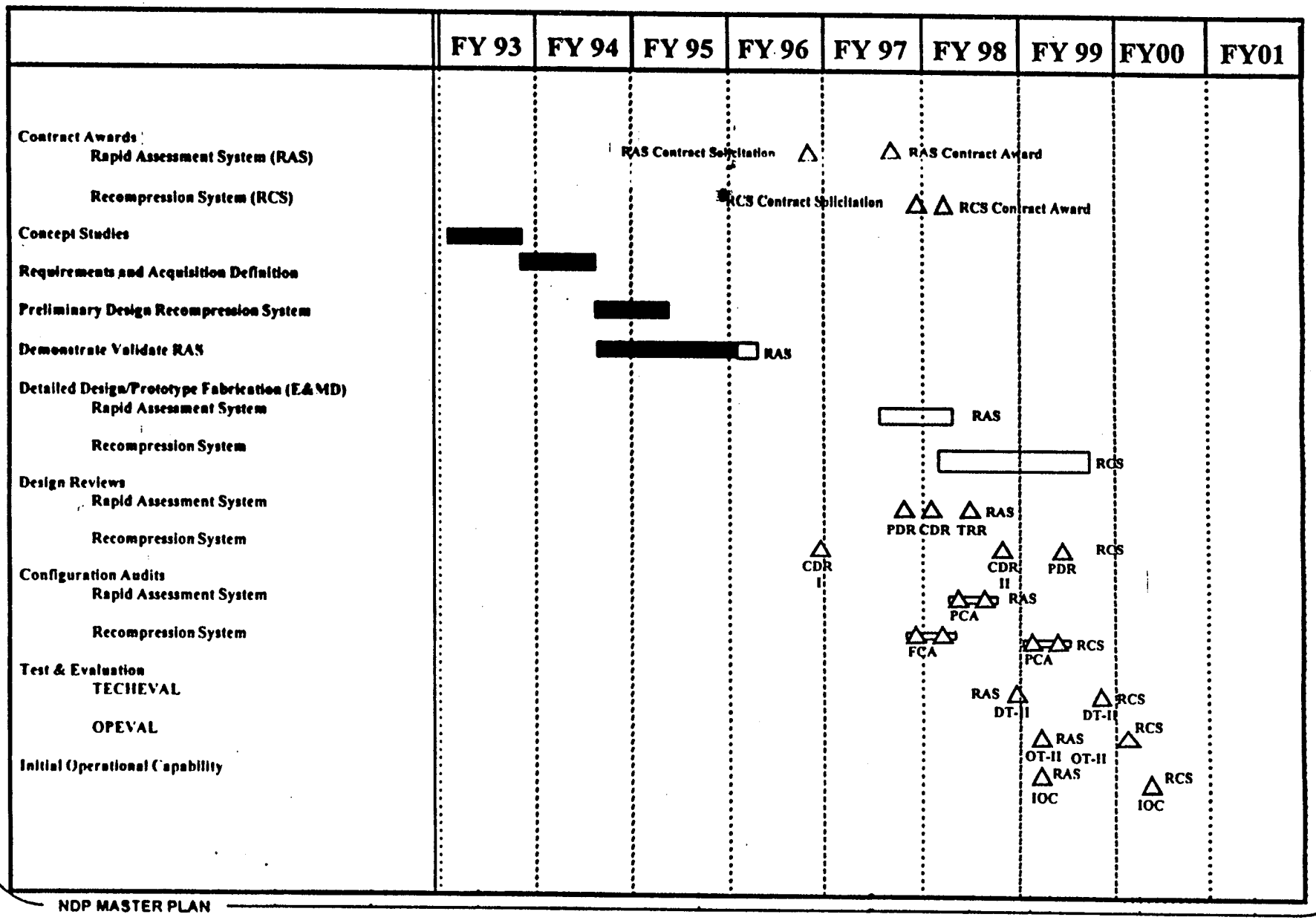
(U) RELATED RDT&E: Not Applicable.

D. (U) SCHEDULE PROFILE: See attached.

PROGRAM ELEMENT: 0603713N
PROJECT: S0394

Submarine Rescue Diving and Recompression System

Schedule



FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603721N
PROGRAM ELEMENT TITLE: Environmental Protection

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
S0400	Ordnance Reclamation								
	0	1,097	0	0	0	0	0	0	26,703
S0401	Shipboard Waste Management								
	40,630	55,457	40,484	43,573	50,047	64,154	48,563	CONT.	CONT.
T2042	Plastic Substitution								
	144	0	0	0	0	0	0	0	1,056
W2210	Aviation Pollution Prevention								
	0	1,756	1,477	2,058	2,500	2,099	1,892	CONT.	CONT.
Y0817	Pollution Abatement Ashore								
	8,201	5,553	6,440	7,310	7,948	8,079	8,230	CONT.	CONT.
TOTAL	48,975	63,863	48,401	52,941	60,495	74,332	58,685	CONT.	CONT.

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This program develops processes, prototype hardware, systems and operational procedures that will allow the Navy to operate in the U.S., foreign and international waters, air, space, and land areas while complying with U.S. statutes and international agreements. The program also includes efforts to improve the Navy's response to salvage-related pollution incidents. Projects support the Navy's requirement to meet environmental standards outlined by Environmental Protection Agency Executive Order 12088 of October 1978, The Act to Prevent Pollution from Ships, 1993 Amendment and DoD Directive 6050.4 of 16 March 1982, DoD Directive 4210.15 of 27 July 1989, DoD Directive 6050.15 of 14 June 1985, and DoD Directive 6050.9 of 13 February 1989. Project S0401 includes RDT&E efforts that allow the Navy to be in compliance with existing and anticipated laws with regard to four major areas: 1) Ozone Depletiing Substances, 2) Solid Waste, 3) Liquid Waste, and 4) other ship wastes.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under DEMONSTRATION & VALIDATION because it develops and integrates hardware for experimental test related to specific ship or aircraft applications.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603721N
PROGRAM ELEMENT TITLE: Environmental Protection

(U) COST (Dollars in Thousands)

PROJECT NUMBER TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
S0401 Shipboard Waste Management	40,630	55,457	40,484	43,573	50,047	64,15[illegible]	48,563	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: Project develops equipments and procedures for managing shipboard waste. Emphasis is on developing shipboard systems to enable compliance with national, state, and international regulations and on achieving an affordable pollution-free profile for future ships and submarines. This program also develops conservation technologies and ozone-safe replacement chemical technologies for Navy solvents and shipboard refrigeration and firefighting systems.

1. (U) FY 1995 ACCOMPLISHMENTS:

- (U) ($23,594) Ozone Depleting Substances - Completed development of backfit modifications for shipboard CFC-12 refrigeration systems. Selected HFC-236fa as the non-chlorofluorocarbon alternative refrigerant to CFC-114 for fleet implementation and continued development of backfit modifications for surface ship CFC-114 air conditioning systems. Completed fabrication of and initiated manufacturer's qualification of future fleet non-chlorofluorocarbon 125-ton twin screw air conditioning plant prototype. Completed design and began prototype fabrication of future fleet non-chlorofluorocarbon 200-ton centrifugal air conditioning plant and 1.5-ton refrigeration plant. Continued investigation of substitute substances for Halon fire fighting systems on aircraft and ships. Continued development of alternative firefighting agent delivery systems. Completed development of alternative (non-ozone depleting) solvents and processes for all solvent systems with the exception of oxygen systems cleaning applications.

- (U) ($7,847) Solid Wastes - Continued studies in support of Report to Congress to comply with special area provisions of MARPOL, Annex V. Completed Operational Evaluations and obtained Approval for Full Rate Production (AFRP) for the Plastics Processor, Small Pulper, Large Pulper and Solid Waste Shredder. Initiated investigation of Plasma Arc (PA) technology for solid waste. No funding was budgeted for development of a shipboard zero discharge solid waste treatment system because no feasible system has been identified to date.

- (U) ($7,431) Liquid Waste Streams - Performed shipboard laboratory evaluations on over-arching liquid waste treatment concepts directed at future shipboard uniform discharge standards. Initiated evaluation of DD963 vortex incinerators to improve reliability and determined ability to handle other waste streams including concentrated oily wastes and graywater wastes. Continued test and evaluation of breadboard Graywater Treatment System (GWTS). Initiated shipboard evaluation of breadboard secondary Oily Waste Polishing Systems (OWPS). Continued investigations of shipboard compensated fuel ballast systems.

- (U) ($1,758) Other Major Ship Wastes - Continued shipboard Hazardous Waste substitution and elimination task. Continued developments of Recovered Oil Logistic System, Oil Spill Contingency Planning Program and In-Situ Oil Burning System (ISOBS).

2. (U) FY 1996 PLAN:

- (U) ($18,967) Ozone Depleting Substances - Complete development of backfit modification kits for two surface ship 200-ton CFC-114 air conditioning plant designs. Complete development of backfit modification kits for 300-ton surface ship CFC-114 air conditioning plant designs. Continue development of backfit modifications for other surface ship CFC-114 air conditioning systems. Continue with qualification testing of future fleet non-chlorofluorocarbon 125-ton twin screw air conditioning plant prototype. Complete prototype fabrication and begin manufacturer's qualification of a future fleet non-chlorofluorocarbon 200-ton centrifugal air conditioning plant and 1.5-ton refrigeration plant. Complete development of alternative fire fighting agent delivery systems for new ship construction. Evaluate promising alternative non-ozone depleting firefighting technologies from science and technology programs. Complete development of alternative solvents and processes for oxygen systems cleaning applications.

- (U) ($21,400) Integrated Liquid Wastes - Continue development of shipboard over-arching liquid waste treatment system including the following: complete shipboard test and evaluation of a breadboard secondary oily waste polishing system and initiate and complete development of advanced development model. Evaluate alternative oily waste polishing system (OWPS). Initiate shipboard test and evaluation of breadboard graywater treatment system and upgraded shipboard vortex incinerator system modified to process graywater and oily waste concentrate in addition to sewage. Initiate development of advanced development model graywater treatment system. Continue evaluation of low flow water minimization appliances, devices and marine sanitation devices. Initiate development of an advanced Oil Content Monitor (OCM). Design an Oil Water Separator (OWS) for shipboard compensated fuel ballast systems. Initiate development of improved bilge detergents.

- (U) ($7,000) Solid Wastes - Perform studies supporting FY 1996 Report to Congress on plan to comply with special area provisions of the International Convention for the Prevention of Pollution from Ships (MARPOL), Annex V, and the associated Environmental Impact Statement for Navy Solid Waste Management Plan. Continue test and evaluation of prototype solid waste processing equipment for surface ships.

- (U) ($7,587) Other Major Ship Wastes - Continue shipboard Hazardous Waste substitution and elimination program. Initiate R&E of shipboard pollution prevention equipment (PPE) to identify their high potential for Fleet cost reduction. Initiate investigation, test and evaluation of non-asbestos substitute gaskets, packing and brake/clutch faces used in shipboard machinery. Initiate laboratory testing on compliant commercial paints to ensure that environmental regulatory limits for Volatile Organic Compound (VOC) content, Hazardous Air Pollutants (HAP) as well as heavy metal and toxic contaminants are met. Continue development of Recovered Oil Logistic System and Oil-Spill Contingency Planning Program (OSCPS). Complete development of In-Situ Oil Burning System(ISOBS).

- (U) ($503) Portion of extramural program reserved for Small Business Innovative Research assessment in accordance with 15 U.S.C. 638.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603721N PROGRAM ELEMENT TITLE: Environmental Protection PROJECT NUMBER: S0401 PROJECT TITLE: Shipboard Waste Management

3. (U) FY 1997 PLAN:

- (U) ($12,534) Ozone Depleting Substances - Complete qualification of backfit modification kits for two surface ship 200-ton CFC-114 air conditioning plant designs. Complete qualification of backfit modification kits for 300-ton surface ship CFC-114 air conditioning plant designs. Complete development of the backfit modification kits for the surface ship 125-ton CFC-114 air conditioning plant design. Continue development of backfit modifications for other surface ship air conditioning systems. Begin efforts to perform one-year at-sea ship test of backfit modification on shipboard 200-ton CFC-114 plants. Complete qualification testing and initiate laboratory evaluation of future fleet non-chlorofluorocarbon 125-ton twin screw air conditioning plant prototype. Complete manufacturer's qualification of future fleet non-chlorofluorocarbon 200-ton centrifugal air conditioning plant and 1.5-ton refrigeration plant; begin laboratory evaluations of prototype hardware. Evaluate promising alternative non-ozone depleting substances firefighting technologies from science and technology community.

- (U) ($15,140) Integrated Liquid Wastes - Continue development of shipboard over-arching liquid waste treatment system including the following: Continue development of secondary oily waste polishing system. Continue development of improved bilge cleaning detergents and advanced oil content monitor. Complete shipboard test and evaluation of breadboard graywater treatment system. Continue development of an advanced development model graywater treatment system and continue testing upgraded vortex incinerator system. Continue design of oil water separator for shipboard compensated fuel ballast systems and initiate fabrication and ship installation. Initiate testing of Non-Seeping Grease Seal (NSGS) on submarine dive and steering gear.

- (U) ($8,510) Solid Wastes - Complete effort supporting Report to Congress on plan to comply with special area provisions of the International Convention for the Prevention of Pollution from Ships (MARPOL), Annex V. Initiate development of a plastic processor system for submarine application. Initiate investigation of technologies for the management of paper, cardboard and food wastes and metal and glass wastes for submarines. Complete support for Environmental Impact Statement (EIS) for Navy Solid Waste Management Plan. Complete test and evaluation of prototype solid waste processing equipment.

- (U) ($4,300) Other Major Ship Wastes - Continue shipboard Hazardous Waste substitution and elimination task. Continue T&E of pollution prevention equipment aboard ship. Continue investigation of non-asbestos substitutes and initiate preparation of a final report and substitute specifications. Continue quality assurance testing on reformulated commercial paints. Complete developments of Oil Spill Logistic System and Oil Spill Contingency Planning System (OSCPS). Initiate development of Oil Skimmer Efficiency Improvement Program (OSEIP), Light Oil Recovery Modification System and Oil Skimmer Tracking System.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603721N
PROGRAM ELEMENT TITLE: Environmental Protection

PROJECT NUMBER: S0401
PROJECT TITLE: Shipboard Waste Management

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996 President's Budget:	40,883	57,264	46,309
(U) Adjustments from PRESBUDG:	-253	-1,807	-5,825
(U) FY 1997 PRESBUDG Submit:	40,630	55,457	40,484

(U) CHANGE SUMMARY EXPLANATION:

1. (U) Funding: The $253K reduction in FY 1995 reflects a decrease in program requirements. The FY 1996 decrease of $1807K was a result of Congressional undistributed general and inflation reductions ($1089); and revised DOD inflation rates and other minor pricing adjustments ($718). FY 1997 increase of $2807K is for the development of the capability to convert submarine CFC-114 air conditioning plants to operate with a non-chlorofluorocarbon refrigerant, to initiate investigations for submarine solid waste handling systems and submarine solid waste minimization. This increase is offset by other program requirements ($6398); and revised DOD inflation estimates and other minor pricing adjustments ($2234).

2. (U) Schedule Changes: Not applicable.

3. (U) Technical: Not applicable.

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

(U) RELATED RDT&E: Not Applicable.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603721N
PROGRAM ELEMENT TITLE: Environmental Protection

PROJECT NUMBER: S0401
PROJECT TITLE: Shipboard Waste Management

D. (U) SCHEDULE PROFILE:

	FY 1995	FY 1996	FY 1997	TO COMPLETE
Program Milestones	1Q MS 0 GWTS 1Q MS 0 OWPS 2Q MS III SWS 2Q MS III PP 2Q MS III LP 2Q MS III SP	3Q R-12 Mod IOC 3Q MS I GWTS	1Q SW Report to Congress 1Q MS 0 Sub PP	4Q Comp Div of OWPS
Engineering Milestones	4Q Comp Solv Wk 3Q Comp CFC-12 Refer Dev't 1Q Select CFC-114 Replacement 1Q Investigate PA Technology 4Q Comp design of Fleet 200 ton AC & 1.5-ton Refer Plant	4Q Comp O_2 Solv Wk 4Q Comp Dev't 200-ton CFC-114 AC plants* 4Q Comp Dev't 300-ton CFC-114 AC plants* 1Q Initiate T&E of Compliant Paints 1Q Initiate T&E of Non-Asbestos Sub'ts 1Q Initiate Dev't of Advanced OCM 1Q Complete Dev't of ISOBS 3Q Initiate T&E of PPE 4Q Complete Dev't of Non-ODS Firefighting Agents New Ship Construction	4Q Comp Qual'n 125-ton non-CFC AC plants* 4Q Comp Qual'n 200-ton CFC-114 AC plants* 4Q Comp Qual'n 300-ton CFC-114 AC plants* 4Q Comp Qual for Future Fleet 200-ton AC & 1.5-ton Refer Plant* 2Q Complete support EIS for Navy SW plan 2Q Complete T&E of prototype SW equip 1Q Initiate T&E of NSGS 1Q Initiate plastic processor for submarines	4Q Comp Tests of Breadboard GWTS 4Q Comp Quality Tests Reformulated Paints 4Q Comp Dev of ISOBS 4Q Comp Dev of ISOBS
T&E Milestones	1Q Comp OPEVAL PP 1Q Comp OPEVAL SP 1Q Comp OPEVAL SWS			
Contract Milestones				

* For surface ships only. Includes AC mod-kits.

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603721N
PROGRAM ELEMENT TITLE: Environmental Protection

PROJECT NUMBER: S0401
PROJECT TITLE: Shipboard Waste Management

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

Project Cost Categories	FY 1995	FY 1996	FY 1997
a. Ozone Depleting Substances	23,594	18,967	12,534
b. Solid Wastes	7,847	7,000	8,510
c. Integrated Liquid Wastes	7,431	21,400	15,140
d. Other Major Shipboard Wastes	1,758	7,587	4,300
e. SBIR	--	503	--
Total	40,630	55,457	40,484

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603721N PROJECT NUMBER: S0401
PROGRAM ELEMENT TITLE: Environmental Protection PROJECT TITLE: Shipboard Waste Management

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

PERFORMING ORGANIZATIONS

Contractor/Government Performing Activity	Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1994 Budget	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Product Development:										
Westinghouse, Machinery Technology Division										
Pittsburg, PA	CC/CPFF	8/86	N/A	14,610	9,430	5,150	30	0	0	14,610
Geo-Centers, Inc										
Boston, MA	C/CPFF	Various	Various	N/A	0	0	7,000	3,000	Cont.	Cont.
York International Corporation										
York, PA	SS/CPFF	12/92	10,000	10,000	1,200	510	2,500	3,000	2,790	10,000
Northern Research and Engineering Corporation, Inc										
Pittsburg, PA	C/CPFF	3/94	4,200	4,200	500	700	1,000	1,000	1,000	4,200
Misc. Contracts	WR	Various	Various	N/A	9,300	4,200	8,000	6,500	Cont.	Cont.
Support and Management:	Various:		N/A	70	70	0	0	0	Cont.	Cont.
Test and Evaluation:										
NAVSURFWARCEN DET										
Annapolis, MD	WR	Various	N/A	N/A	19,568	12,575	21,897	16,669	Cont.	Cont.
Naval Research Laboratory										
Washington, DC	WR	Various	N/A	N/A	5,060	3,745	4,570	1,915	Cont.	Cont.
NAVAIRWARCENACDIV										
Warminster, PA	WR	Various	N/A	N/A	3,080	935	0	0	Cont.	Cont.
NNSY										
Portsmouth, VA	WR	Various	N/A	N/A	3,658	300	800	200	Cont.	Cont.
NAVAIRWARCENACDIV										
Lakehurst, PA	WR	Various	N/A	N/A	3,400	185	300	300	Cont.	Cont.
NCCOSC	WR	Various	N/A	N/A	950	1,100	500	500	Cont.	Cont.
Wright Patterson AFB										
Fairborn, OH	MPPR	Various	N/A	N/A	2,550	1,500	0	0	Cont.	Cont.
Misc Gov't Labs	WR	Various	N/A	N/A	2,520	155	60	0	Cont.	Cont.
York International Corporation										
York, PA	C/CPFF	Various	25,000	25,000	6,100	4,875	2,300	400	11,325	25,000
Geo-Centers Inc										
Boston, MA	C/CPFF	Various	Various	Various	1,675	3,200	2,000	2,000	Cont.	Cont.
Misc Contracts	C/CPFF	Various	N/A	Various	740	1,500	4,500	5,000	Cont.	Cont.

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603721N
PROGRAM ELEMENT TITLE: Environmental Protection

PROJECT NUMBER: S0401
PROJECT TITLE: Shipboard Waste Management

	Total FY 1994 Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Subtotal Product Development	20,430	10,560	18,530	13,500	Cont.	Cont.
Subtotal Support and Management	70	0	0	0	0	0
Subtotal Test and Evaluation	49,301	30,070	36,927	26,984	Cont.	Cont.
Total Project	69,801	40,630	55,457	40,484	Cont.	Cont.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603721N
PROGRAM ELEMENT TITLE: Environmental Protection

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
W2210 Aviation Pollution Prevention	0	1,756	1,477	2,058	2,500	2,699	1,892	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: Development and implementation of technologies which will lead to environmentally safe naval aviation operations and support; compliance with international, federal, state, and local regulations and policies; reduction of increasing compliance costs and personal liability; and enhancement of naval aviation mission effectiveness. Naval aviation pollution prevention efforts were previously supported by Project Y0817, Pollution Abatement Ashore. This project will support that part of project Y0817 that addressed aviation pollution prevention technologies as well as additional operational and shipboard aviation requirements previously unsupported.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS: Not applicable.

2. (U) FY 1996 PLAN:

- (U) ($1,445) Develop and test: Alternatives for cadmium, chromium, and cyanide plating; nonchromate aluminum pretreatment; non-hazardous chemical paint stripping processes; compliant solvents and cleaners; blast media treatment processes; molten salt bath plating process; zinc-nickel and tin-zinc alternates to cadmium plating; and nonchromated sealants.
- (U) ($161) Optimize low volatility diluents and non-toxic corrosion control pigments.
- (U) ($150) Demonstrate performance of water-borne topcoat.

3. (U) FY 1997 PLAN:

- (U) ($1,217) Continue to develop and test: Alternatives for cadmium, chromium,and cyanide plating nonchromate aluminum pretreatment; non-hazardous chemical paint stripping processes; compliant solvents and cleaners; blast media treatment processes; molten salt bath plating process; zinc-nickel and tin-zinc alternates to cadmium plating; and nonchromated sealants.
- (U) ($121) Continue to optimize low volatility diluents and non-toxic corrosion control pigments.
- (U) ($139) Continue to demonstrate performance of water-borne topcoat. Develop non-hazardous shipboard aviation materials and processes.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603721N PROGRAM ELEMENT TITLE: Environmental Protection PROJECT NUMBER: W2210 PROJECT TITLE: Aviation Pollution Prevention

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996 President's Budget:	0	1,821	2,164
(U) Adjustments from PRESBUDG:	0	-65	-687
(U) FY 1997 PRESBUDG Submit:	0	1,756	1,477

(U) CHANGE SUMMARY EXPLANATION:

1. (U) Funding: The reduction of $65K in FY96 was for Congressional undistributed general and inflation reductions ($34K); and revised DOD inflation rates and other minor pricing adjustments ($31K). Reductions in FY 1997 were reduced program requirements ($21K); and other revised DOD inflation estimates and other minor pricing adjustments ($666K).

2. (U) Schedule Changes: Not applicable.

3. (U) Technical: Not applicable.

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

(U) RELATED RDT&E:

(U) PE 0602233N (Readiness/Training/Environmental Quality)

(U) PE 0603716D (Strategic Environmental R&D Program)

D. (U) SCHEDULE PROFILE: Not applicable.

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603721N PROJECT NUMBER: W2210
PROGRAM ELEMENT TITLE: Environmental Protection PROJECT TITLE: Aviation Pollution Prevention

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

Project Cost Categories	FY 1995	FY 1996	FY 1997
a. Development Test & Evaluation	0	1,357	1,032
b. Operational Test & Evaluation	0	387	433
c. Travel	0	12	12
Total	0	1,756	1,477

(U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION ($ in thousands) Not applicable.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603721N PROJECT NUMBER: Y0817
PROGRAM ELEMENT TITLE: Environmental Protection PROJECT TITLE: Pollution Abatement Ashore

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
Y0817 Pollution Abatement Ashore	8,201	5,553	6,440	7,310	7,948	8,079	8,230	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project develops and validates non-shipboard technologies to comply with environmental laws and policies applicable to Naval shore, harbor, and coastal operations in order to reduce cost, regulatory oversight, and personal liability while preserving or enhancing accomplishment of the underlying military mission.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS:

- (U) ($2,042) Aircraft Maintenance - Demonstrated a non-Cr aluminum pretreatment. Optimized low volatile organic compound (VOC) diluents. Developed non-Cr sealants. Prepared specifications for low VOC cleaners. Developed Non-Cr bonding process. Tested alternate plating and stripping chemicals and processes. Issued non-Cr primer specification.

- (U) ($1,560) Facilities Operation - Transitioned epoxy pipe lining process via site demonstration. Terminated OBA canister treatment project when a lower cost commercial alternative was identified. Transitioned engine modification technology for diesel engine emissions. Completed transition of QWIKLITE rapid marine bioassay technique. Transitioned reduced solid precipitation technology. Continued development and validation of a) sensors to detect presence and source of toxic substances and b) simulation models to extrapolate origin and forecast fate of those substances. Both are needed to focus Navy resources on minimizing the most damaging releases and identify the non-Navy sources of toxic wastes found in Navy harbors.

- (U) ($1,068) Material Management - Improved/modified field installation and conduct tests of bulk fuel leak detection system. Transitioned alternate disposal criteria for first group of expired shelf-life items.

- (U) ($2,053) Ordnance Management - Successfully tested explosive mixtures in boiler fuel. Completed development testing of prototype rocket motor exhaust scrubber. Evaluated alternative pyrotechnic dye destruction technologies. Assisted field installation/production use of supercritical fluid extraction to recover propellant ingredients. Installed ultraviolet destruction unit for explosives in air.

- (U) ($1,478) Ship Repair: Validated ketone replacement paint system. Tested prototype equipment for interior space paint removal. Negotiated contract and construct abrasive recycling facility. Completed validation and transition sodium nitrite treatment.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603721N PROJECT NUMBER: Y0817
PROGRAM ELEMENT TITLE: Environmental Protection PROJECT TITLE: Pollution Abatement Ashore

2. (U) FY 1996 PLAN:

- (U) ($3,598) Compliance - Begin: a) effort to accelerate validation of emerging lower-cost hazardous waste disposal technology to reduce Navy disposal costs by 50% by gathering technical, economic, and regulatory performance data for characteristic Navy wastes from a range of ongoing and planned demonstrations by other agencies and industry; b) validation of additional sound propagation algorithms for Navy -unique scenarios needed to adapt existing Tri-Service noise models for Navy use in assessing and reducing the noise impacts of Navy operations in coastal areas on nearby communities; and c) evaluation of technologies to reduce the cost of removal and disposal of materials contaminated with polychlorinatedbiphenyls (PCBs) from deactivated Navy submarines. Complete validation of: a) Controlled Air Incinerator for the destruction of colored smokes and dyes in Navy pyrotechnics; b) Ultraviolet (UV) oxidation technologies for destruction of nitrate esters in water waste streams from explosive manufacturing processes; c) new low Volitile Organic Compound (VOC) lining systems for use in concrete and steel POL tanks; d) systems to reduce Nitrous Oxide emissions from diesel-generators in the Navy's Mobile Utilities Support Equipment (MUSE) inventory; and e) a treatment system for sodium nitrite wastewater from marine steam boiler maintenance operations.

- (U) ($1,955) Pollution Prevention - Begin development of: a) system to control and dispose of Aqueous Film Forming Foam (AFFF) wastes generated by the testing of firefighting equipment; and b) ceramic crossflow ultrafiltration (CCF) system to recycle contaminated aqueous degreasers. Complete validation of: a) process for disposing of explosive wastes by using as an industrial boiler fuel supplement; b) process for producing propellants without solvents having VOC/toxic air emissions; and c) process for validating longer shelf lives for selected Navy hazardous materials.

3. (U) FY 1997 PLAN:

- (U) ($4,211) Compliance - Begin: a) effort to quantify hexavalent chromium emissions from shipyard metal fabrication operations and, where required, identify cost-effective non-hazardous alternatives; and b) development of a Confined Burn Facility that will provide an environmentally compliant alternative to Open Burn/Open Detonation (OB/OD) disposal of ordnance. Complete validation of: a) leak detection system for the 12 million gallon capacity underground fuel storage tanks at the Fleet and Industrial Supply Center (FISC) Red Hill facility; b) alternative affordable capping methods for coastal landfills in high precipitation areas where contaminated leachate production is a problem; and c) DOD noise model enhancements for Navy-unique operational scenarios.

- (U) ($2,229) Pollution Prevention - Complete validation of: a) instrumented buoy system to detect pierside oil spills; b) leak detection and locating (LDL) systems for underground high capacity fuel distribution pipelines; and c) Aqueous Film Forming Foam (AFFF) control and disposal system for wastes generated by firefighting equipment testing.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603721N
PROGRAM ELEMENT TITLE: Environmental Protection

PROJECT NUMBER: Y0817
PROJECT TITLE: Pollution Abatement Ashore

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996 President's Budget:	8,212	5,731	5,437
(U) Adjustments from PRESBUDG:	-11	-178	+1003
(U) FY 1997 PRESBUDG Submit:	8,201	5,553	6,440

(U) CHANGE SUMMARY EXPLANATION:

1. (U) Funding: FY95 decrease of $11K reflects a reduction in program requirements. Decrease in FY96 was a result of Congressional undistributed general and inflation reductions ($108K); and revised DOD inflation rates and other minor pricing adjustments ($70K). Additional funding of $1,830K were provided to this project starting in FY97 from the termination of Project S0400, Ordnance Reclamation. This will consolidate oversight and execution management of the demonstration and validation of ordnance-related environmental protection technologies. This increase is offset by revised DOD inflation estimates and other minor pricing adjustments ($827).

2. (U) Schedule Changes: Not applicable.

3. (U) Technical: Not applicable.

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

(U) RELATED RDT&E: Not applicable.

D. (U) SCHEDULE PROFILE: Not applicable.

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FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603724N
PROGRAM ELEMENT TITLE: Navy Energy Program (ADV)

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
R0829 Energy Conservation (ADV)	2,773	1,917	1,800	1,756	2,095	2,106	2,073	CONT.	CONT.
R0838 Mobility Fuels (ADV)	3,755	0	1,280	1,612	1,698	1,684	1,674	CONT.	CONT.
TOTAL	6,528	1,917	3,080	3,368	3,793	3,790	3,747	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This program supports projects to evaluate, adapt, and develop energy related technologies for ship, aircraft, and land-based operations to: (a) increase fuel-related weapons systems capabilities such as range and time on station; (b) conserve energy and reduce energy costs; (c) reduce Navy shore facilities dependence on petroleum fuels and apply energy technologies that improve environmental compliance; (d) relax unnecessarily restrictive fuel specification requirements to reduce cost and increase availability worldwide; (e) provide guidance to fleet operators for the safe use of commercial grade or off-specification fuels when military specification fuels are unavailable or in short supply; and (f) make needed periodic changes to fuel specifications to ensure fuel quality and avoid fleet operating problems. Through 1985, the Navy Energy R&D Program, of which this program element is a part, had produced energy cost avoidance estimated at $127M per year (compared to 1975 consumption rates). As currently funded, savings of $140M per year by 1995 and $165M per year by FY 2000 are projected compared to 1985 costs.

(U) This program, and the companion PE 0604710N, Navy Energy Program (ENG), support the achievement of Executive Department, DOD, and Navy Energy Management Goals.

(U) Joint Mission Areas/Support Areas (JMA/SA): This program directly supports the Readiness, Support, and Infrastructure SA. It also supports the following JMA's: Forward Presence, Joint Surveillance, Strategic Sealift, and Joint Strike.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under DEMONSTRATION & VALIDATION because it develops and integrates hardware for experimental tests related to specific ship or aircraft applications.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603724N
PROGRAM ELEMENT TITLE: Navy Energy Program (ADV)

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
R0829 Energy Conservation (ADV)	2,773	1,917	1,800	1,756	2,095	2,106	2,073	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project improves the energy efficiency of Navy ships, aircraft, and shore facilities and thereby contributes to reduced operating costs and improved fleet sustainability and performance. Major efforts include work to increase the efficiency of aircraft engines; develop improved hull coatings and auxiliary equipment for ships; and develop renewable/alternative energy resources, energy conservation technologies, and energy use management strategies for Navy shore facilities.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS:
   - (U) ($1,100) Aircraft: Initiated F414 advanced control modes demonstration (formerly Integrated Flight and Propulsion Control (IFPC)) via selection of control modes, software development and rig tests. Transitioned J52 CIP turbine seal mod to NAVAIR J52 CIP program. Integrate Flight Performance Advisory System, developed in category 6.5, into IFPC program. $262K will be forward financed to FY 1996 to continue funding this effort.
   - (U) ($1,240) Ships: Qualified the ozone-safe refrigerant HFC 236fa for retrofit of fleet air conditioning plants currently using R-114 (DD-963, CG-47, DDG-51, LHD-1, CV/CVN). Patch tested promising Easy Release (silicone) and advanced ablative copper (with organic cobiocide for biofilm control) hull coatings. Continued to adapt hull cleaning process to needs of advanced anti-fouling (AF) coatings. Evaluated stern flap for CG-47/DD-963 and reduced tip clearance propellers to increase propulsion efficiency.
   - (U) ($433) Facilities: Evaluated photovoltaic (PV) integrated roof systems for distributed load center grid support applications. Evaluated utility demand control system peak shaving technology for Navy applications.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603724N PROJECT NUMBER: R0829
PROGRAM ELEMENT TITLE: Navy Energy Program (ADV) PROJECT TITLE: Energy Conservation (ADV)

2. (U) FY 1996 PLAN:
- (U) ($592) Aircraft: Continue advanced control modes demonstrations for F414 engine and F/A-18 E/F airframe. Demonstrate inlet distortion model and advanced control logic effects on full authority digital engine control (FADEC) operation and resulting engine responses. Develop energy efficiency retrofit package for F/A-18 C/D. Initiate design of new high pressure turbine (HPT) for F414 growth engine.
- (U) ($831) Ships: Evaluate bow bulbs for DDG-51 and DD-963/CG-47 hulls to reduce powering requirements. Develop hull cleaning procedures for "easy release" silicone AF coatings Monitor self cleaning performance of "easy release" coatings and biofilm formation resistance of ablative copper coatings "boosted" with organic cobiocides. Validate impeller optimization software for design of high efficiency new construction airconditioning plants which will use ozone-safe HFC-134a refrigerant.
- (U) ($494) Facilities: Complete development of clean steam and metered/conditioned electrical power for pierside support of ships.

3. (U) FY 1997 PLAN:
- (U) ($700) Aircraft: Complete advanced control modes demonstrations and transition technology to F414 engine and F/A-18 E/F airframe development programs. Develop/integrate components of F/A-18 C/D energy efficiency package: FADEC with inlet distortion model; extend flap/aileron scheduled droop to interdiction mission; enhance fidelity of flight path optimization systems. Complete design of increaseed airflow/efficiency HPT for F414 growth engine.
- (U) ($1,100) Ships: Monitor development of robotic hull cleaning device in category 6.3 (will allow selective spot cleaning for slime and/or hard fouling). Continue screening tests of advanced AF materials/coating systems. Monitor fuel cell power generation science and technology development to ensure attention to fuel issues (reformation of F76 diesel fuel and desulfurization) and marinization requirements. Design high efficiency airconditioning plant for new construction. Complete model tests of improved bow bulb/stern modifications package for TAO-187 and demonstrate reduced powering requirements.

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996 President's Budget:	2,773	1,976	2,019
(U) Adjustments from FY 1996 PRESBUDG:	0	-59	-219
(U) FY 1997 PRESBUDG Submit:	2,773	1,917	1,800

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603724N PROJECT NUMBER: R0829
PROGRAM ELEMENT TITLE: Navy Energy Program (ADV) PROJECT TITLE: Energy Conservation (ADV)

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1996 adjustment is due to the following: Congressional undistributed general and inflation reductions (-37); and revised DOD inflation rates and other minor pricing adjustments (-22). FY 1997 adjustment is due to revised DOD inflation estimates and other minor pricing adjustments (-219).

(U) Schedule: Facilities energy conservation thrust area discontinued in FY 1997 because of fueling constraints.

(U) Technical: Not applicable.

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

(U) RELATED RDT&E:
(U) PE 0601153N (Defense Research Sciences)
(U) PE 0602121N (Surface Ship and Submarine HM&E Technology)
(U) PE 0602122N (Aircraft Technology)
(U) PE 0602234N (Materials, Electronics, and Computer Technology)
(U) PE 0603217N (Air Systems and Weapons Advanced Technology)
(U) PE 0603712N (Environmental Quality and Logistics Advanced Technology)
(U) PE 0604710N (Navy Energy Program (ENG))

D. (U) SCHEDULE PROFILE: Not applicable.

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603724N PROGRAM ELEMENT TITLE: Navy Energy Program (ADV) PROJECT NUMBER: R0829 PROJECT TITLE: Energy Conservation (ADV)

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

Project Cost Categories	FY 1995	FY 1996	FY 1997
a. System Development and Integration	2,773	1,917	1,800
Total	2,773	1,917	1,800

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

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603724N
PROGRAM ELEMENT TITLE: Navy Energy Program (ADV)

(U) COST: (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
R0838 Mobility Fuels (ADV)	3,755	0	1,280	1,612	1,698	1,684	1,674	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project provides data through engine and fuel system tests which relate the effects of changes in Navy fuel procurement specification properties to the performance and reliability of Naval ship and aircraft engines and fuel systems. This information is required to: (a) determine the extent to which unnecessarily restrictive specification features can be relaxed to reduce cost and increase availability worldwide. (Compared to current fuel costs, savings of over $20M per year, excluding transportation cost savings, are projected to be achievable); (b) provide guidance to fleet operators for the safe use of off-specification or commercial grade fuels when military specification fuels are unavailable or in short supply; and (c) make needed periodic changes to fuel specifications to ensure fuel quality and avoid fleet operating problems while accommodating evolutionary changes in the fuel supply industry. Recent problems with fuel quality have adversely affected ship and aircraft system performance and reliability and resulted in degradation of fuel in storage. The resulting readiness impacts, additional maintenance costs, and the cost of lost equipment, although difficult to quantify, are many times the cost of this project. Over the next decade, the potential for fuel quality related problems will increase because of changing industry practices required to comply with new environmental regulations. This project represents the only investment designed to maintain the Navy's ability to operate as a "smart" customer for fuels that costs over $2B per year to procure, transport, store and consume and are essential to fleet operations.

1. (U) FY 1995 ACCOMPLISHMENTS:
   - (U) ($937) Ships: Initiated program to determine effects of Environmental Protection Agency mandated fuel dyes on Navy engine system reliability. Initiated Allison 501 gas turbine engine ignition, flame stability and thermal performance tests with broadened specification fuels (BSFs). Procured lubricity test equipment and modified test procedure to allow effects of sea water contamination to be determined. Surveyed shipboard equipment inventory to identify most fuel lubricity sensitive systems. Initiated effort to support removal of gasoline from Navy ships.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603724N PROJECT NUMBER: R0838
PROGRAM ELEMENT TITLE: Navy Energy Program (ADV) PROJECT TITLE: Mobility Fuels (ADV)

- (U) ($720) Aircraft: Assessed impact of +100 thermal stability additives on Navy systems. Assessed impact of copper contaminated fuel on F/A-18E/F engine maintenance requirements. Evaluated effectiveness of an additional ten candidate non-toxic, environmentally benign fuel system icing inhibitors. Initiated development of improved fuel/water separation technology required to allow use of +100 additives. Initiated development of a "filter" to remove dissolved copper from jet fuel.
- (U) ($2,098) These funds are being forward financed to FY 1996 to continue funding the following efforts:
  - (U) Ships: Conduct preliminary atmospheric burner rig tests for gas turbine engine (GTE) corrosion scaling factor development. Initiate new worldwide survey of commercial marine gas oils. Complete Allison 501-K17/K34 GTE ignition, flame stabilization, and thermal performance evaluations on BSF matrix. Initiate bench-scale experiments to determine fuel lubricity characteristics of low sulfur, low aromatic F-76.
  - (U) Aircraft: Determine benefits of +100 additives for Navy engines/components with high nozzle coking and deposit forming tendencies (e.g. E-2C). Perform full scale tests of candidate non-toxic, environmentally benign fuel system icing inhibitors. Bench test jet fuel copper contamination "filter". Continue development of fuel/water separation technology for +100 additives.

2. (U) FY 1996 PLAN: Not applicable.

3. (U) FY 1997 PLAN:
- (U) ($680) Ships: Continue sample collection and characterization of commercial marine gas oils from sources worldwide. Complete atmospheric tests for GTE corrosion scaling factor development. Complete bench-scale fuel lubricity experiments.
- (U) ($600) Aircraft: Perform full scale testing of +100 additive compatible fuel/water separation technology. Fleet test +100 additive technology at an air station. Fleet test fuel copper contamination removing "filter".

B. (U) PROGRAM CHANGE SUMMARY

	FY 1995	FY 1996	FY 1997
(U) FY 1996 President's Budget:	6,255	0	0
(U) Adjustments from FY 1996 PRESBUDG:	-2,500	0	+1,280
(U) FY 1997 PRESBUDG Submit:	3,755	0	1,280

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603724N PROJECT NUMBER: R0838
PROGRAM ELEMENT TITLE: Navy Energy Program (ADV) PROJECT TITLE: Mobility Fuels (ADV)

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1995 funding reduction reflects a decrease to program requirements. FY 1997 funding was restored to previously budgeted levels due to assessed importance of program (+1,600). Additional adjustments to FY 1997 are due to the following: revised DOD inflation estimates and other minor pricing adjustments (-320).

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

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

(U) RELATED RDT&E:
(U) PE 0601152N (In-House Lab Independent Research)
(U) PE 0602234N (Materials, Electronics, and Computer Technology)

D. (U) SCHEDULE PROFILE: Not applicable.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603724N PROGRAM ELEMENT TITLE: Navy Energy Program (ADV) PROJECT NUMBER: R0838 PROJECT TITLE: Mobility Fuels (ADV)

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

Project Cost Categories	FY 1995	FY 1996	FY 1997
a. Reliability, Maintainability, and Availability	3,755	0	1,280
Total	3,755	0	1,280

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 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Product Development:										
Miscellaneous					115,445	3,755	0	1,280	CONT.	CONT.

Support and Management: Not applicable.

Test and Evaluation: Not applicable.

GOVERNMENT FURNISHED PROPERTY: Not applicable.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603724N PROJECT NUMBER: R0838
PROGRAM ELEMENT TITLE: Navy Energy Program (ADV) PROJECT TITLE: Mobility Fuels (ADV)

	Total FY 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Subtotal Product Development	115,445	3,755	0	1,280	CONT.	CONT.
Subtotal Support and Management	0	0	0	0	0	0
Subtotal Test and Evaluation	0	0	0	0	0	0
Total Project	115,445	3,755	0	1,280	CONT.	CONT.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603725N
PROGRAM ELEMENT TITLE: Facilities Improvement

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
Y0995 Navy Facilities Systems	2,493	1,748	2,239	1,861	902	929	958	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project provides for advanced development to reduce the cost of the Navy shore infrastructure through full scale test validations of new concepts and advancing technologies. It focuses on Navy needs where private facilities R&D is lacking, and transfers Navy Exploratory Development and Advanced Technology facilities research, and applies university research to Navy requirements. Current thrusts are: (a) A High Performance (HP) Magazine to increase ammunition storage efficiency thereby enabling better land use and new options for base consolidations and reduced munitions storage operating costs; (b) Specialized techniques to enable Naval Construction Force Underwater Construction Teams to rapidly assess the load-carrying capacity of waterfront structures under contingency scenarios; and (c) Participation in the Joint Test Program to evaluate the survivability of facilities.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under DEMONSTRATION & VALIDATION because it completes development of technologies and verifies their application to specific ship, aircraft, or facility requirements.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS:

- (U) ($2,293) Completed design of HP Magazine prototype for full scale explosive testing to certify explosives safety performance. Developed test plans to evaluate the hazard mitigation effectiveness of prototype pit cover cross sections.
- (U) ($80) Completed validation of rapid load assessment techniques, developed by Exploratory Development research, to evaluate the capability of piers to support military operational loads.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603725N PROJECT NUMBER: Y0995
PROGRAM ELEMENT TITLE: Facilities Improvement PROJECT TITLE: Navy Facilities Systems

(U) FY 1995 ACCOMPLISHMENTS (CONTINUED):

- (U) ($120) Completed testing on effectiveness of CCD techniques; evaluated and reported on most effective use of CCD to protect targets and train aircrews.

2. (U) FY 1996 PLAN:

- (U) ($1,748) Construction and quality assurance of the HP Magazine prototype. Conduct pit cover explosives safety tests. Develop test plans for FY 1997 operational and certification tests of HP Magazine prototype.

3. (U) FY 1997 PLAN:

- (U) ($956) Complete construction and quality assurance of the HP Magazine prototype. Conduct operational and certification tests. Compile and analyze test data, and complete technical documentation required to obtain DOD Explosive Safety Board approval. Apply for DOD Explosive Safety Board approval.

- (U) ($1,283) Begin demonstration and validation of advanced technologies to reduce the life-cycle costs of Navy waterfront facilities. Thrust areas include: a) early flaw detection; b) more durable repairs; and c) alternative upgrade concepts.

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996 President's Budget:	2,493	1,803	893
(U) Adjustments from PRESBUDG:		-55	-354 +1700
(U) FY 1997 President's BUDGET Submit:	2,493	1,748	2,239

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603725N PROJECT NUMBER: Y0995
PROGRAM ELEMENT TITLE: Facilities Improvement PROJECT TITLE: Navy Facilities Systems

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY96 funding changes reflect Congressional undistributed general and inflation reductions (-34); and revised DOD inflation rates and other minor pricing reductions (-21). FY97 Funding changes from the President's Budget reflect additional funding to complete validation of the HP Magazine and to begin demonstration and validation of waterfront facilities technologies, transitioning from the Navy's Exploratory Development and Advanced Technology Demonstration programs, that will reduce the life-cycle costs of the Navy's waterfront infrastructure (+1700K). This increase is offset by revised DOD inflation estimates and other minor pricing adjustment (-354).

(U) Schedule: Not applicable

(U) Technical: Not applicable

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

(U) RELATED RDT&E:

(U) PE0602233N (Mission Support Technology)

(U) PE0602234N (Materials, Electronics and Computer Technology)

(U) PE0603792N (Environmental Quality and Logistics Advanced Technology)

D. (U) SCHEDULE PROFILE: Not applicable.

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603725N PROJECT NUMBER: Y0995
PROGRAM ELEMENT TITLE: Facilities Improvement PROJECT TITLE: Navy Facilities Systems

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

Project Cost Categories	FY 1995	FY 1996	FY 1997
a. Systems Engineering	886	0	506
b. Prototype Development	0	0	507
c. Prototype Fabrication	1887	1591	0
d. Test and Evaluation	418	0	1120
e. Technical Documentation	103	157	106
Total	2493	1748	2239

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

PERFORMING ORGANIZATIONS
NFESC, Port Hueneme, CA

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1993 & Prior	FY 1994 Budget	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Product Development					58,074						
NFESC	WX		N/A	N/A		1,168	1,003	427	2,239	CONT.	CONT.
NAWC China Lake	WX		N/A	N/A		200	140	160	0		
Const. Contractor	FP		N/A	N/A		0	1,350	1,161	0		
Support and Management											
Test and Evaluation											

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4
PROGRAM ELEMENT: 0603725N
PROGRAM ELEMENT TITLE: Facilities Improvement
PROJECT NUMBER: Y0995
PROJECT TITLE: Navy Facilities Systems

GOVERNMENT FURNISHED PROPERTY: Not applicable

	Total FY 1993 & Prior	FY 1994 Budget	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Subtotal Product Development	58,074	1,368	2,493	1,748	2,239	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 Project	58,074	1,368	2,493	1,748	2,239		

FY 1997 RDT&E BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603755N
PROGRAM ELEMENT TITLE: Ship Self Defense

(U) COST: (Dollars in Thousands)

PROJECT ACTUAL TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
U0172 CIWS (PHALANX)	3,425	0	0	0	0	0	0	0	6,425
U2039 COOP ENGAGEMENT CAPABILITY (CEC)	153,754	256,840	164,503	151,088	88,722	46,604	49,279	CONT.	CONT.
U2133 QUICK REACTION COMBAT CAPABILITY (QRCC)	18,378	4,383	2,077	4,284	4,587	4,576	4,686	CONT.	CONT.
U2136 LINK IRON	39,562	47,052	42,111	39,486	45,825	45,888	47,050	CONT.	CONT.
U2184 ANTI-AIR WARFARE COORDINATION TECHNOLOGY (FACT)	12,015	8,171	7,795	7,705	7,964	7,957	8,158	CONT.	CONT.
U2236 SMALL CALIBER GUN TEST	2,500	0	0	0	0	0	0	0	2,500
TOTAL	229,634	316,446	216,486	202,563	147,098	105,025	109,173	CONT.	CONT.

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This program incorporates efforts dedicated to the enhancement of ship self defense against Anti-Air Warfare (AAW) threats. Its primary focus is on the development of technologies, systems, and procedures necessary to defeat the evolving Anti-Ship Cruise Missile (ASCM) threat. These projects focus on ship defense improvements through the development of advanced concepts and capabilities which will enhance both defense in depth of ships in a force and self defense of individual ships in a littoral war fighting environment. Cooperative Engagement Capability (CEC), Project U2039, develops concepts for coordinating all Battle Force sensors into a single, real-time, composite track picture having fire control quality. Quick Reaction Combat Capability (QRCC), Project U2133, provides advanced concepts and technology developments for the multi-sensor integration of ship detection equipment, integration and coordination of ship self defense weapons, and coordination of hardkill and softkill assets to improve individual ship self defense capabilities against the ASCM threat. Force Anti-Air Warfare Coordination Technology (FACT), Project U2184, demonstrates Force Anti-Air Warfare (AAW) concepts and capabilities which will enhance the AAW war fighting ability of ships and aircraft and enable the coupling of the Force into a single, distributed AAW weapon system through more effective use of tactical data, and force sensors and weapons. A description of Project U2136, LINK IRON, is not included due to a higher level of classification.

FY 1997 RDT&E BUDGET ITEM JUSTIFICATION SHEET

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603755N
PROGRAM ELEMENT TITLE: Ship Self Defense

(U) JUSTIFICATION FOR BUDGET ACTIVITY: These projects are funded under Demonstration and Validation because they develop and integrate hardware and software for experimental demonstrations and tests related to specific ship or aircraft applications.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603755N
PROGRAM ELEMENT TITLE: Ship Self Defense

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
U2039 Cooperative Engagement Capability (CEC)	153,754	256,840	164,503	151,088	88,722	46,604	49,279	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: Cooperative Engagement Capability (CEC) significantly improves Battle Force Anti-Air Warfare (AAW) capability by coordinating all Battle Force AAW sensors into a single, real-time, composite track picture having fire control quality. CEC distributes sensor data from each ship and aircraft, or cooperating unit (CU), to all other CUs in the battle force through a real-time, line of sight, high data rate sensor and engagement data distribution network. CEC is highly resistant to jamming and provides accurate gridlocking between CUs. Each CU independently employs high capacity, parallel processing and advanced algorithms to combine all distributed sensor data into a fire control quality track picture which is the same for all CUs. CEC data is presented as a superset of the best AAW sensor capabilities from each CU, all of which are integrated into a single input to each CU's combat weapons system. CEC will significantly improve our Battle Force defense in depth, including both local area and ship defense capabilities against current and future AAW threats. CEC is designed to enhance the AAW warfighting ability of ships and aircraft and to enable coupling of the Force into a single, distributed AAW weapon system and towards more effective use of tactical data and the cooperative use of all the Force sensors and weapons. These capabilities will provide the ship defense flexibility needed to meet the threat brought about by increasing numbers of highly sophisticated weapons held by potentially hostile third world countries.

(U) CEC consists of the Data Distribution System (DDS), the Cooperative Engagement Processor (CEP), and Combat System Modifications. The DDS encodes and distributes ownship sensor and engagement data, is a high capacity, jam resistant, directive system providing a precision gridlocking and high throughput of data. The CEP is a high capacity distributed processor which is able to process force levels of data in a timely manner that allows its output to be considered real-time fire control data. This data is passed to the ship's combat system as fire control quality data for which the ship can cue its onboard sensors or use the data to engage targets without actually tracking them.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603755N
PROGRAM ELEMENT TITLE: Ship Self Defense

PROJECT NUMBER: U2039
PROJECT TITLE: Cooperative Engagement Capability (CEC)

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS:

- (U) ($17,865) Completed analysis of Developmental Testing/Operational Testing (DT/OT) lessons learned to fully support continued developmental efforts in CEC system design and fleet operations and tactics.
- (U) ($73,848) Continued development of shipboard Common Equipment Set (CES) and incorporated results of DT/OT testing into system design and ship integration.
- (U) ($62,041) Continued development of airborne CES for integration with E-2C aircraft.

2. (U) FY 1996 PLAN:

- (U) ($3,050) Complete Initial Operational Capability (IOC) certification for shipboard CEC system.
- (U) ($134,257) Continue development of shipboard CES.
- (U) ($15,568) Continue development of airborne CES for integration with E-2C aircraft.
- (U) ($7,240) Continue assessment of system performance and development of tactical applications during active fleet exercises.
- (U) ($22,435) Develop organic infrastructure for CES Integrated Logistics Support (ILS).
- (U) ($23,000) Initiate engineering studies to integrate CEC with joint service weapon systems.
- (U) ($46,000) Modify Naval Research Laboratory (NRL) and fleet owned P-3 aircraft to provide dedicated airborne support for CEC test program.
- (U) ($5,290) Portion of extramural program reserved for Small Business Innovation Research (SBIR) assessment in accordance with 15 U.S.C. 638.

3. (U) FY 1997 PLAN:

- (U) ($105,247) Continue development of shipboard CES.
- (U) ($44,600) Continue development of airborne CES for integration with E-2C aircraft.
- (U) ($5,156) Conduct Initial Operational Test and Evaluation (IOT&E) of shipboard CES.
- (U) ($9,500) Continue development of organic ILS infrastructure for CES.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603755N PROJECT NUMBER: U2039
PROGRAM ELEMENT TITLE: Ship Self Defense PROJECT TITLE: Cooperative Engagement Capability (CEC)

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996 Presidents's Budget:	148,815	180,049	182,236
(U) Adjustments from PRESBUDG:	+4,939	+76,791	-17,733
(U) FY 1997 PRESBUDG Submit:	153,754	256,840	164,503

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: Changes in FY 1995 due to University Research and Small Business Innovative Research adjustments, and other minor pricing adjustments. Changes in FY 1996 due to Congressional appropriation increase, Congressional undistributed general and inflation reductions, and revised DOD inflation rates and other minor pricing adjustments. Changes in FY 1997 due to program restructure, maintenance of VANDAL target production, adjustments supporting the Mine Warfare Master Plan, revised inflation estimates and other minor pricing adjustments.

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

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

	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
OPN 260600	0	0	0	84,534	86,349	96,581	105,467	455,869	828,800
SCN Various	0	0	9,300	12,600	28,000	37,800	61,100	104,200	253,000
O&M 1D4D	0	2,320	13,562	15,189	20,546	25,625	30,101	CONT.	CONT.
APN 330000	0	0	587	5,756	10,883	18,180	8,412	304,982	348,800
RDT&E 0204152N	0	10,000	9,900	5,100	0	0	0	0	25,000

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603755N
PROGRAM ELEMENT TITLE: Ship Self Defense

PROJECT NUMBER: U2039
PROJECT TITLE: Cooperative Engagement Capability (CEC)

(U) RELATED RDT&E:

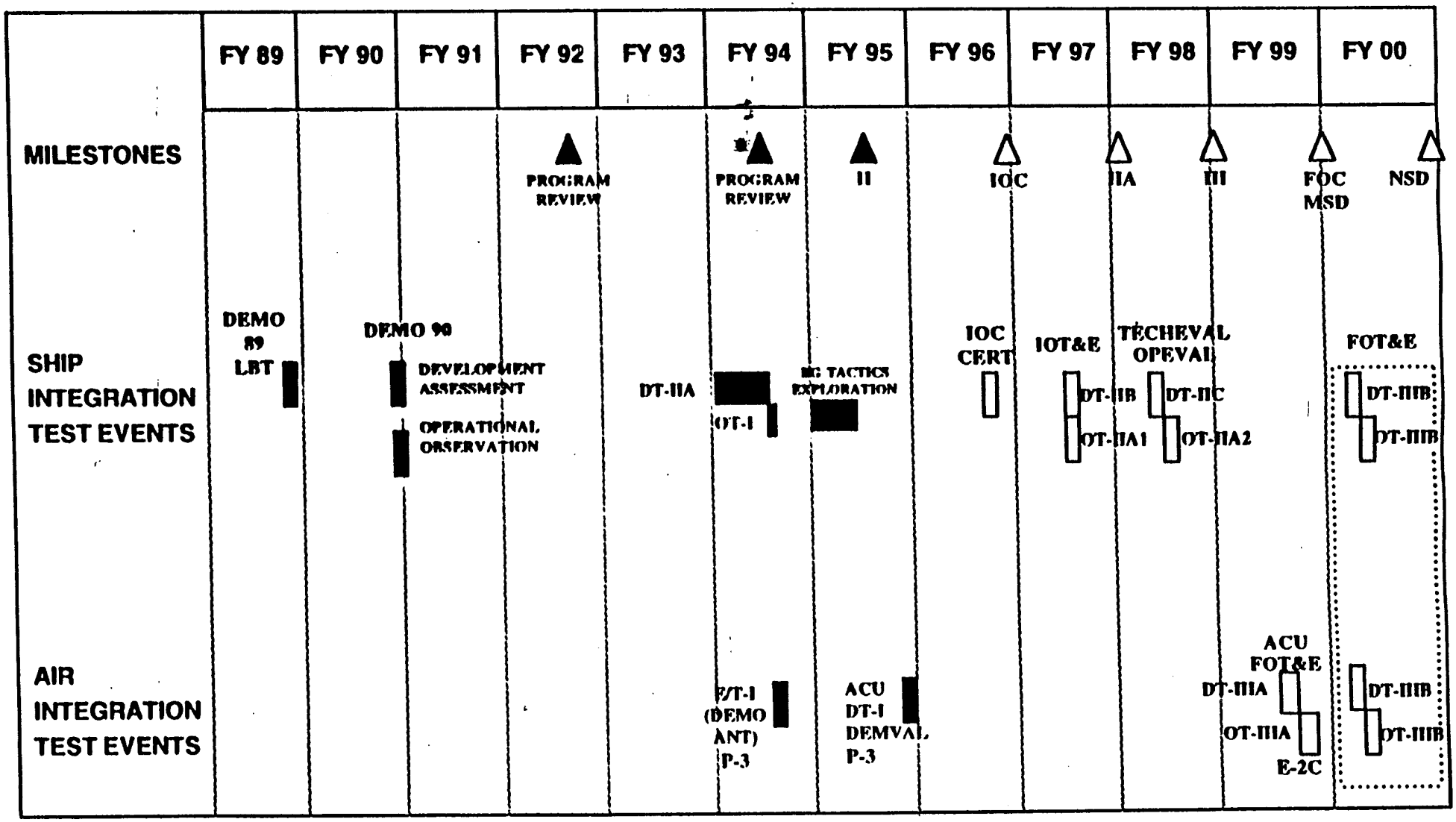
(U) PE 0205604N (Tactical Data Links)
(U) PE 0604307N (AEGIS Combat System Engineering)
(U) PE 0604366N (Standard Missile Improvements)
(U) PE 0604518N (Combat Information Center Conversion)
(U) PE 0204152N (E-2C Improvements)

D. (U) SCHEDULE PROFILE: See attached.

THEATER AIR DEFENSE
TAD
PROGRAM EXECUTIVE OFFICE

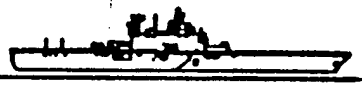
CEC PROGRAM STRUCTURE

CEC



000465

CEC FIELDING SCHEDULE

	SHIP CLASS	RDT&E, N Funded						OPN, APN & SCN Funded										PROCURE TOTALS
		93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	
AREA DEFENSE SHIPS	AEGIS CG-47 	1				2		3	3	3	4	3	2	2	2			22
	AEGIS DDG-51 									1	4	8	12	12	13	7		57
	DDG-993 (NTU) 								2	2								4
SELF DEFENSE SHIPS	CV/CVN 					1		4	2	1	2	2	2		1			14
	AMPHIBIOUS LPD-17 								1		2	2	2	2	2	1		12
	AMPHIBIOUS LHD/LHA 					1		2	1	1	2	1	2	2				11
	AMPHIBIOUS LSD-41 												2	3	3	4		12
	DD-963 												3	3	3	3		12
	E-2C 					2				1	3	1	11	12	11	8		47
	LBTS / TRAINING SITE					4		3	2	1		3						9
	TOTAL BY YEAR (New Units)	1				10		12	11	10	17	20	36	36	35	23		200
	CUMULATIVE TOTAL BY YEAR	7	7	7	7	17	17	12	23	33	50	70	106	142	177	200	200	

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603755N
PROGRAM ELEMENT TITLE: Ship Self Defense

PROJECT NUMBER: U2039
PROJECT TITLE: Cooperative Engagement Capability (CEC)

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

Project Cost Categories	FY 1995	FY 1996	FY 1997
a. Program Management	10,302	16,777	10,400
b. Systems Engineering	22,538	46,900	27,200
c. Equipment Assembly	43,067	35,327	21,775
d. Software Development	22,264	30,100	20,500
e. Integration	36,271	66,896	56,075
f. Installation	1,000	34,511	5,975
g. Test	2,552	9,892	7,220
h. Technical Data	2,749	3,683	2,415
i. ILS	13,011	12,754	12,943
Total	153,754	256,840	164,503

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603755N
PROGRAM ELEMENT TITLE: Ship Self Defense

PROJECT NUMBER: U2039
PROJECT TITLE: Cooperative Engagement Capability (CEC)

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 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Product Development:										
E-Systems St. Petersburg, FL	SS/CPFF	3/95	CONT.	CONT.	79,303	73,155	96,576	56,396	CONT.	CONT.
JHU/APL Laurel, MD	SS/CPFF	1/95	CONT.	CONT.	45,000	26,950	27,500	20,000	CONT.	CONT.
ITT Van Nuys, CA	CPFF	12/94	8,156	8,156	2,250	5,706	200	0	0	8,156
RAYTHEON Tewksbury, MA	CPFF	12/94	2,878	2,878	1,610	1,268	0	0	0	2,878
NAVSURFWARCENDIV Crane, IN	WR	Var	CONT.	CONT.	3,939	1,075	3,743	4,700	CONT.	CONT.
NAVSURFWARCENDIV Dahlgren, VA	WR	Var	CONT.	CONT.	6,956	3,106	8,000	4,000	CONT.	CONT.
NAVSURFWARCENDIV Port Hueneme, CA	WR	Var	CONT.	CONT.	12,429	3,475	5,685	6,000	CONT.	CONT.

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603755N PROGRAM ELEMENT TITLE: Ship Self Defense PROJECT NUMBER: U2039 PROJECT TITLE: Cooperative Engagement Capability (CEC)

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 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Product Development:										
Norfolk Naval Shpyd Norolk, VA	SS/CPFF	Various	CONT.	CONT.	3,200	1,100	3,825	3,700	CONT.	CONT.
Lockheed Aeronautical Sys Co. Marietta, GA	C/FFP	3/96	26,500	26,500	0	0	26,500	0	26,500	26,500
Grumman Aerospace Co. Bethpage, LI, NY	C/CPFF	3/96	7,500	7,500	0	0	7,500	0	0	7,500
Loral Corp. Eagan, MN	C/CPFF	3/96	16,000	16,000	0	0	16,000	0	0	16,000
AWACS SPO, Hanscom AFB, MA	MIPR	3/96	4,000	4,000	0	0	4,000	0	0	4,000
NCCOSC, RDTE DIV San Diego, CA	WR	11/94	CONT.	CONT.	5,167	9,630	5,080	1,330	CONT.	CONT.
DRPM, AEGIS	PD	Various	148,225	148,225	15,035	20,258	32,189	25,977	54,766	148,225
NAVSUP Washington, DC	PD	Various	2,844	2,844	2,542	152	150	0	0	2,844

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603755N PROGRAM ELEMENT TITLE: Ship Self Defense PROJECT NUMBER: U2039 PROJECT TITLE: Cooperative Engagement Capability (CEC)

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

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
NAVAIR PMA-231 Washington, DC	PD	Various	172,613	172,613	5,400	700	7,800	36,600	122,113	172,613
Naval Airship Prog. Washington, DC	PD	Various	10,000	10,000	10,000	0	0	0	0	10,000
Miscellaneous	Various	Various	CONT.	CONT.	696	695	550	240	CONT.	CONT.
UNISYS, Inc. St. Paul, MN	C/CPIF	11/94	CONT.	CONT.	0	3,212	4,800	0	CONT.	CONT.
Support and Management:										
Technautics, Inc. Alexandria, VA	CPFF	4/95	CONT.	CONT.	1,207	1,192	1,532	1,175	CONT.	CONT.
VITRO Silver Spring, MD	SS/CPFF	11/94	2,108	2,108	1,750	175	183	0	0	2,108
Miscellaneous	Various	Various	CONT.	CONT.	1,287	1,177	2,636	585	CONT.	CONT.

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603755N PROGRAM ELEMENT TITLE: Ship Self Defense PROJECT NUMBER: U2039 PROJECT TITLE: Cooperative Engagement Capability (CEC)

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

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Test and Evaluation:										
OPTEVFOR Norfolk, VA	WR	Various	5,832	5,832	1,395	230	220	1,200	2,787	5,832
AFWTF Roosevelt Roads, PR	WR	Various	4,067	4,067	511	0	525	1,300	1,731	4,067
Miscellaneous	Various	Various	6,423	6,423	2,979	498	1,646	1,300	0	6,423

GOVERNMENT FURNISHED PROPERTY: Not applicable.

	Total FY 1994 & Prior	FY 1995 Budget	FY 1996 Budget	Total FY 1997 Budget	To Complete	Total Program
Subtotal Product Development	193,527	150,482	250,098	158,943	CONT.	CONT.
Subtotal Support and Management	4,244	2,544	4,351	1,760	CONT.	CONT.
Subtotal Test and Evaluation	4,885	728	2,391	3,800	4,518	16,322
Total Project	202,656	153,754	256,840	164,503	CONT.	CONT.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603755N
PROGRAM ELEMENT TITLE: Ship Self Defense

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
U2133 Quick Reaction Combat Capability (QRCC)	18,378	4,383	2,077	4,284	4,587	4,576	4,686	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The QRCC project implements an evolutionary acquisition of improved ship self defense capabilities against anti-ship cruise missiles for selected non-AEGIS ships by integrating existing and programmed anti-air warfare stand-alone systems. It provides an automated quick reaction and multi-target engagement capability emphasizing performance in the littoral environment. Integration focuses on coordinating existing sensor information, providing threat identification and evaluation, assessing defensive readiness, and recommending an optimized defensive tactical response to counter single and multiple anti-ship cruise missile attacks. Subsequent modifications and upgrades will optimize the Ship Self Defense System (SSDS) and provide enhanced self defense capabilities while allowing for insertion of advanced technologies during Engineering and Manufacturing Development and Production and Deployment Phases. System design emphasizes use of nondevelopmental items, commercial standards, Next Generation Computer Resources, computer program re-use, and open architecture. QRCC replaces manual control of several different ship self defense systems with a single integrated capability under the computer aided control of ship operators. Improvements to current system performance for short range anti-air ship self defense will implement the SSDS, incorporate multi-sensor integration of existing sensors, improve ship defense local command and control functions by automation of the detect through engagement sequence under the control of flexible embedded doctrine, integrate and coordinate weapon systems, and provide hardkill/softkill integration. The current focus of this project is the development of the SSDS which leverages recent critical experiments, the Rapid Anti-Ship Missile Integrated Defense System (RAIDS) program efforts, and the SSDS demonstration on USS WHIDBEY ISLAND (LSD 41) in June 1993. System architecture centers on a distributed processing concept which uses a fiber optic local area network (LAN), LAN access units, advanced Display System workstations, and software to integrate existing sensors and weapons. The initial effort will focus on the LSD 41 class of ships to integrate existing LSD 41 class sensors, the Rolling Airframe Missile (RAM), Phalanx Close-in Weapon System (CIWS), and Electronic Countermeasures System (AN/SLQ-32). Other ship systems such as ship support, navigation, and Identification Friend or Foe will also be integrated into the system via the LAN. The distributed architecture allows the incremental evolution and implementation of follow-on modification to the SSDS which will integrate other ship self defense elements,

such as the NATO Seasparrow missile system, Target Acquisition System (TAS), and other sensors, as well as the RAM, CIWS, and AN/SLQ-32 installations on other ship classes. Ships with a Combat Direction System (CDS) or the Advanced Combat Direction System (ACDS) will also have those systems integrated with SSDS to optimize the use of offboard track data in ship self defense and transmit SSDS track data to other ships.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS:

- (U) ($2,143) Completed transitioning to E&MD for SSDS MK 1 version for LSD class ship, to include risk reduction studies.
- (U) ($700) Conducted advanced engineering studies to support the integration of SSDS with the Advanced Combat Direction System (ACDS) Block 1 Level 3 LHD variant in order to provide the LHD class with an Integrated Ship Defense (ISD) capability.
- (U) ($11,200) Continued development efforts on the SDTS to include remoting of all combat system signals, data extract capability and completed outfitting in support of planned testing.
- (U) ($4,335) Continued analysis efforts focusing on impact of Littoral Warfare environment on SSDS architecture/elements and required design improvements, to include SSDS MK 1 system adaptation/risk reduction studies for LHD, LHA, and CV/CVN class ships.

2. (U) FY 1996 PLAN:

- (U) ($1,054) Complete ISD adaptation/risk reduction studies for LHD class ships, to include preliminary design.
- (U) ($2,567) Continue analysis efforts focusing on required upgrades to existing elements and identifying new initiatives required to pace the evolving Anti-Ship Cruise Missile (ASCM) threat, including associated upgrades to the operation of the SDTS.
- (U) ($412) Commence ISD adaptation/risk reduction studies for LHA and CV/CVN class ships.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603755N PROJECT NUMBER: U2133
PROGRAM ELEMENT TITLE: Ship Self Defense PROJECT TITLE: Quick Reaction Combat Capability

- (U) ($319) Commence investigations of DOD and non-DOD technology initiatives available to address optimization of hardkill/softkill sensors and weapons.
- (U) ($31) Portion of extramural program reserved for Small Business Innovation Research (SBIR) assessment in accordance with 15 U.S.C. 638.

3. (U) FY 1997 PLAN:
- (U) ($200) Continue ISD adaptation/risk reduction studies for LHA and CVN class ships.
- (U) ($1,877) Continue analysis and requirements efforts to update impact of Littoral Warfare environment and continued ASCM evolution on Ship Self Defense elements, including associated upgrades to the operation of the SDTS.

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996 President's Budget:	18,889	4,689	4,644
(U) Adjustments from PRESBUDG:	-511	-306	-2,567
(U) FY 1997 PRESBUDG Submit:	18,378	4,383	2,077

(U) CHANGE SUMMARY EXPLANATION:
(U) Funding: Changes in FY 1995 due to University Research and Small Business Innovative Research adjustments, and other minor pricing adjustments. Changes in FY 1996 due to Congressional undistributed general and inflation reductions, and revised DOD inflation rates and other minor pricing adjustments. Changes in FY 1997 due to revised inflation estimates, adjustments supporting the Mine Warfare Master Plan, and other minor pricing adjustments.

(U) Schedule: Not applicable.

(U) Technical: Transition for ASDCS ATD. Reflects integration with ACDS.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603755N PROJECT NUMBER: U2133
PROGRAM ELEMENT TITLE: Ship Self Defense PROJECT TITLE: Quick Reaction Combat Capability

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

	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
(U) OPN Line 523400 Pt. Def. Sppt. Eqmt.									
(RAIDS)	573	0	0	0	0	0	0	0	12,677
(SSDS)	0	15,178	21,049	23,474	54,128	57,542	63,072	CONT.	CONT.
(U) O&MN 14D70 Wpn. Maint.									
QRCC	0	0	0	0	2,000	0	0	CONT.	CONT.
(U) SCN 8210									
SSDS MK1	16,430	8,868	0	19,888	0	16,300	16,800	56,000	134,286

(U) RELATED RDT&E:

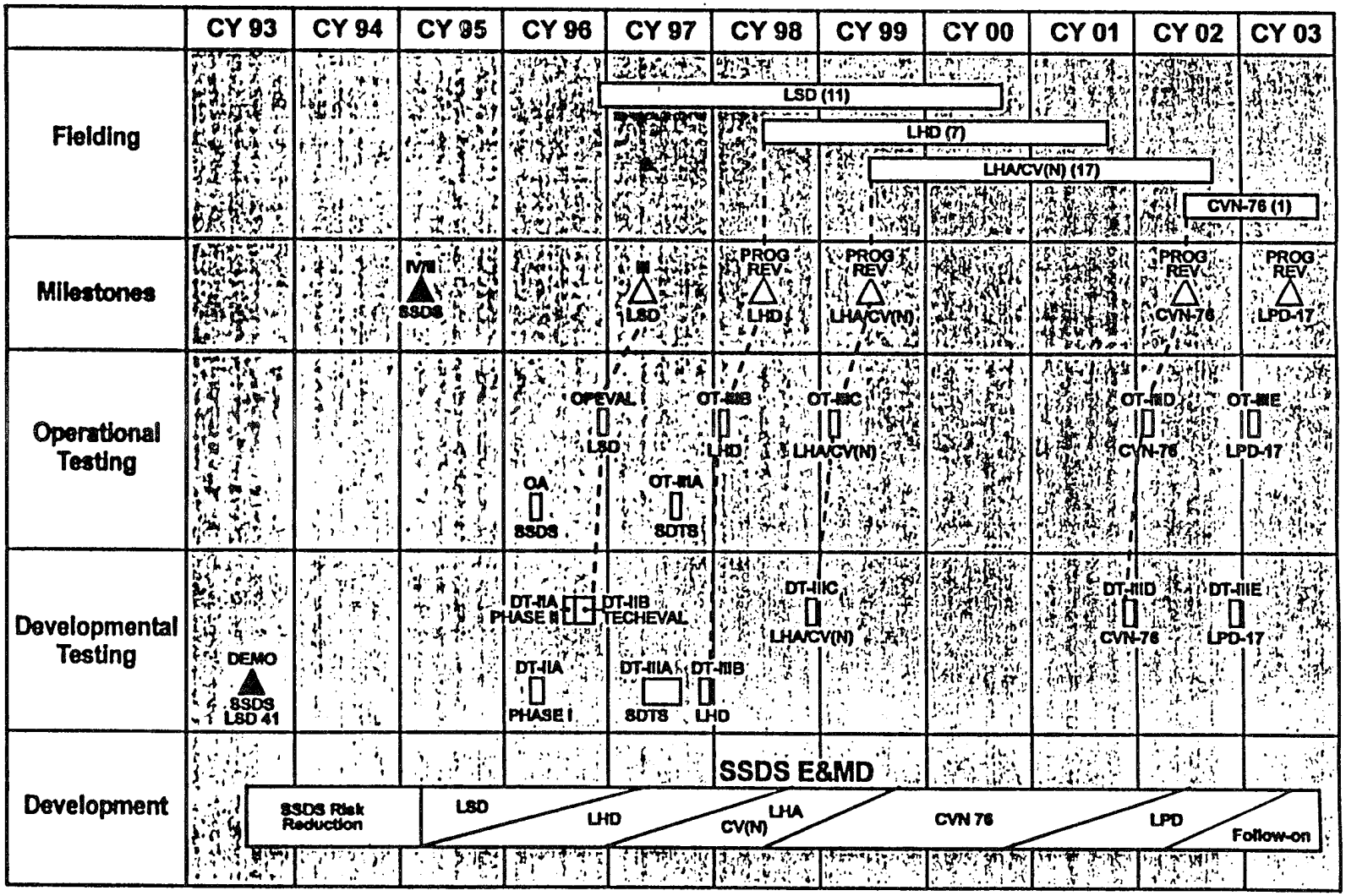
(U) PE 0604755N (SHIP SELF DEFENSE)

D. (U) SCHEDULE PROFILE: See attached.

THEATER AIR DEFENSE TAD PROGRAM EXECUTIVE OFFICE

SSDS PROGRAM STRUCTURE

THEATER AIR DEFENSE



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FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4
PROGRAM ELEMENT TITLE: Ship Self Defense
PROGRAM ELEMENT: 0603755N PROJECT NUMBER: U2133
PROJECT TITLE: Quick Reaction Combat Capability

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

Project Cost Categories	FY 1995	FY 1996	FY 1997
a. Primary Hardware Development	0	0	0
b. Ancillary Hardware Development	0	0	0
c. Software Development	2,489	0	0
d. Systems Engineering	1,038	710	600
e. Training Development	0	0	0
f. Integrated Logistics Support	0	0	0
g. Configuration Management	0	0	0
h. Installation	0	0	0
i. Test & Evaluation	11,365	400	100
j. Government Engineering Support	1,466	1,652	640
k. Program Management Support	1,370	1,371	597
l. Documentation	600	200	100
m. Travel	50	50	40
Total	18,378	4,383	2,077

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603755N PROGRAM ELEMENT TITLE: Ship Self Defense PROJECT NUMBER: U2133 PROJECT TITLE: Quick Reaction Combat Capability

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 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Product Development										
Hughes Tucson, AZ	SS/FP	5/94	17,575	17,575	17,575	0	0	0	0	17,575
NAVSURFWARCENDIV Port Hueneme, CA	WR	Various	6,015	6,015	6,015	0	0	0	0	6,015
NAVSURFWARCENDIV Dahlgren, VA	WR	Various	17,315	17,315	16,315	1,000	0	0	0	17,315
Hughes Tucson, AZ	SS/FP	9/95	1,946	1,946	0	1,946	0	0	0	1,946
Support and Management										
Techmatics Arlington, VA	SS/FP	1/93	3,550	3,550	2,450	700	300	100	0	3,550
JHU/APL Laurel, MD	SS/FP	10/93	CONT.	CONT.	10,815	1,050	1,050	962	CONT.	CONT.
NAVELEXACT St. Inigoes, MD	WR	Various	3,800	3,800	3,800	0	0	0	0	3,800
Miscellaneous various	various	Various	CONT.	CONT.	2,500	2,282	2,233	1,015	CONT.	CONT.

000478

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603755N
PROGRAM ELEMENT TITLE: Ship Self Defense

PROJECT NUMBER: U2133
PROJECT TITLE: Quick Reaction Combat Capability

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Test and Evaluation										
NAVSURFWARCENDIV Port Hueneme, CA	WR	Various	CONT.	CONT.	1,000	11,200	600	0	CONT.	CONT.
NAVSURFWARCENDIV Dahlgren, VA	WR	Various	3,000	3,000	3,000	0	0	0	0	3,000
Miscellaneous various	various	Various	CONT.	CONT.	0	200	200	0	CONT.	CONT.

GOVERNMENT FURNISHED PROPERTY: Not applicable.

	Total FY 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Subtotal Product Development	39,905	2,946	0	0	0	42,851
Subtotal Support and Management	19,565	4,032	3,583	2,077	CONT.	CONT.
Subtotal Test and Evaluation	4,000	11,400	800	0	CONT.	CONT.
Total Project	63,470	18,378	4,383	2,077	CONT.	CONT.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603755N
PROGRAM ELEMENT TITLE: Ship Self Defense

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
U2184 Force Anti-Air Warfare Coordination Technology (FACT)	12,015	8,171	7,795	7,705	7,964	7,957	8,158	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: Force Anti-Air Warfare Coordination Technology (FACT) Program is an advanced development effort designed to demonstrate Force Anti-Air Warfare (AAW) concepts and capabilities which will significantly improve our Force defense in depth, including both local area and self defense capabilities against current and future AAW threats. FACT improvements are designed to enhance the AAW warfighting ability of ships and aircraft and to enable coupling of the Force into a single, distributed AAW weapon system and towards more effective use of tactical data and the cooperative use of all the force sensors and weapons. These capabilities will provide the ship defense flexibility needed to meet the threat brought about by increasing numbers of highly sophisticated weapons held by potentially hostile third world countries. FACT defines requirements and develops prototype systems or modifications to existing systems to test new concepts for the coordination of Force AAW operations. Some examples of prototype systems now in production are AN/SPS-48C Detection Data Convertor, AN/SPS-48E Environmental Control Feature, Shipboard Gridlock System Automatic Correlation (SGS/AC) and Dial-a-Track Link-11 Quality Selection. Other FACT developments nearing production stages are the Automatic Identification System (Auto-ID) and the Multifrequency Link-11 capability; Dual Net Multifrequency Line (DNMFL); Force Threat Evaluation Weapons Assignment (FTEWA); and Precision Electronic Surveillance Measures (ESM) Tracking to Non-Cooperative Detect, Track and ID Targets. Short and long term objectives will be phased in to produce higher degrees of ship defense and battle coordination and effectiveness.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603755N PROGRAM ELEMENT TITLE: Ship Self Defense PROJECT NUMBER: U2184 PROJECT TITLE: Force Anti-Air Warfare Coordination Technology (FACT)

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS:
   - (U) ($8,665) Continued advanced development of FTEWA in support of Combat Air Patrol (CAP) and Surface-to-Air Missile (SAM) integration.
   - (U) ($1,150) Developed and demonstrated Auto-ID with ESM.
   - (U) ($800) Continued RDE development.
   - (U) ($600) Supported Remote Missile Launch (RML) and Forward Pass development.
   - (U) ($400) Conducted experiments to determine feasibility of integrating non-organic data to identify organic Battle Group air tracks in real time.
   - (U) ($400) Supported Link interoperability between Joint and Allied forces, including multiple simultaneous links with emphasis on track identification, and command and control in support of FTEWA.

2. (U) FY 1996 PLAN:
   - (U) ($3,700) Continue advanced development of FTEWA in support of CAP and SAM integration.
   - (U) ($1,500) Develop and demonstrate Auto-ID with ESM.
   - (U) ($873) Support RML and Forward Pass.
   - (U) ($1,000) Continue RDE development.
   - (U) ($608) Support Link-11 interoperability between Joint and Allied Forces, including multiple, simultaneous links with emphasis on track ID, command and control in support of FTEWA.
   - (U) ($305) Continue experiments to determine feasibility of integrating non-organic data to ID organic Battle Group air tracks in real time.
   - (U) ($185) Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15 U.S.C. 638.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603755N PROGRAM ELEMENT TITLE: Ship Self Defense PROJECT NUMBER: U2184 PROJECT TITLE: Force Anti-Air Warfare Coordination Technology (FACT)

3. (U) FY 1997 PLAN:
- (U) ($3,500) Continue advanced development of FTEWA in support of CAP and SAM integration.
- (U) ($1,500) Develop and demonstrate Auto-ID with ESM.
- (U) ($1,000) Continue RDE development.
- (U) ($755) Support RML and Forward Pass.
- (U) ($699) Support Link interoperability between Joint and Allied Forces, including multiple, simultaneous links with emphasis on track ID, command and control in support of FTEWA.
- (U) ($341) Continue experiments to determine feasibility of integrating non-organic data to ID organic Battle Group air tracks in real time.

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996 President's Budget:	6,290	8,298	8,240
(U) Adjustments from PRESBUDG:	+5,725	-127	-445
(U) FY 1997 PRESBUDG Submit:	12,015	8,171	7,795

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: Changes in FY 1995 due to restoration of reductions for University Research and Small Business Innovation Research, and reprogramming action in support of Dual Net Multifrequency Link (DNMFL) and Force Threat Evaluation Weapons Assignment (FTEWA). Changes in FY 1996 due to Congressional appropriation increase, Congressional undistributed general and inflation reductions, revised DOD inflation rates and other minor pricing adjustments. Changes in FY 1997 due to adjustments supporting Mine Warfare Master Plan, revised inflation estimates, and other minor pricing adjustments.

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603755N PROGRAM ELEMENT TITLE: Ship Self Defense PROJECT NUMBER: U2184 PROJECT TITLE: Force Anti-Air Warfare Coordination Technology (FACT)

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

(U) RELATED RDT&E:

(U) PE 0205604N (Tactical Data Links)
(U) PE 0604307N (AEGIS Combat System Engineering)
(U) PE 0604366N (Standard Missile Improvements)
(U) PE 0604518N (Combat Information Center Conversion)

D. (U) SCHEDULE PROFILE: Not applicable.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603785N
PROGRAM ELEMENT TITLE: Combat Systems Oceanographic Performance Assessment (CSOPA)

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
R0120 Advanced Environmental Acoustic Support (AEAS)	9,340	7,501	4,700	4,228	7,379	7,349	7,565	CONT.	CONT.
R2017 Advanced Underwater Acoustic Modeling Project (AUAMP)	2,162	1,573	1,348	1,550	1,989	2,001	2,012	CONT.	CONT.
V0823 Sensor Performance Prediction (SPP)	8,135	6,437	7,602	7,899	10,366	10,321	10,497	CONT.	CONT.
TOTAL	19,637	15,511	13,650	13,677	19,734	19,671	20,074	CONT.	CONT.

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Combat Systems Oceanographic Performance Assessment (CSOPA) Program Element provides oceanographic/atmospheric research and development for expanded knowledge and improved understanding of the environment and its impact on combat systems performance. Its purpose is to assess, predict and enhance the performance of current and proposed undersea surveillance, tactical and mine warfare and weapons systems. This effort is accomplished through at-sea experimentation, numerical model and data base development, development and evaluation of stand-alone and Command, Control, Communications, Computers, and Intelligence (C^4I)-system-embedded prediction/tactical decision aid products, fleet technical support, and system and area technical assessments. Emphasis is placed on shallow water and other complex environments, regional conflict, and crisis response scenarios. The Advanced Environmental Acoustic Support (AEAS) Project conducts oceanographic and acoustic measurements, develops computer prediction products, models and simulations, data bases, and conducts analyses in support of undersea warfare and mine warfare systems. The Advanced Underwater Acoustic Modeling Project (AUAMP) is focused on the development of a family of acoustic system performance prediction products beginning with active system models and data bases in the low-, mid-, and high-frequency regimes and culminating with high fidelity simulation products. The Sensor Performance Prediction Project develops computer-based, on-board capabilities to provide system performance predictions, operating mode selection guidance and tactical decision aids for tactical platforms based on AEAS and AUAMP-developed models and historical data bases using *in situ* measurements and synoptic data. These guidance products are essential to maximize the effective employment of combat systems and weapons in

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603785N
PROGRAM ELEMENT TITLE: Combat Systems Oceanographic Performance Assessment (CSOPA)

highly complex regional conflict littoral warfare areas. The CSOPA Program products are being tailored for, and assimilated into, the Joint Maritime Command Information System to operationally provide accurate system performance predictions and into fleet trainers to provide realistic ocean environments in support of warfare simulations. Direct support to existing fleet systems is provided in the Combatant Data Collection thrust which focuses on *in situ* measurements through operational weapon systems and provides direct, real-time feedback to optimize system performance in tactical situations. The CSOPA Program supports the Joint Mission Areas of Joint Littoral Warfare and Joint Surveillance.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under DEMONSTRATION & VALIDATION because it develops and integrates hardware and software for experimental test related to specific ship or aircraft applications.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603785N
PROGRAM ELEMENT TITLE: Combat Systems Oceanographic Performance Assessment (CSOPA)

(U) COST: (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
R0120 Advanced Environmental Acoustic Support (AEAS)	9,340	7,501	4,700	4,228	7,379	7,349	7,565	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Department of Defense has turned its focus from the global threat of the Soviet Union to the future regional conflict scenarios outlined in the Defense Planning Guidance (DPG). Most of the DPG scenarios require operating naval forces in the earth's littoral waters which are shallow, have highly variable (in space and time) oceanographic conditions and confined maneuvering space. Of key concern to the U.S. Navy is the dual threat posed by very quiet diesel submarines capable of opposing U.S. naval forces and sea mines which will dramatically restrict force mobility and hamper or curtail amphibious operations. To counter these threats, there is an urgent and continuing need for the Navy to fully understand the ocean areas in which they will operate in the future. This project provides the necessary research and development to: a) rapidly and automatically acquire a broad array of meteorological and oceanographic (METOC) data in littoral areas using organic sensors on fleet platforms and use these data to optimize system performance; b) accurately predict the performance of warfighting systems under development or employed in those areas; c) develop new capabilities in environmental acoustic models and data bases to support assessments of regional conflict ocean areas; d) develop a synthetic environment module which will drive future simulations, and e) provide real-time and remote METOC data collection modeling and analysis capabilities.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS:

- (U) ($2,700) Evaluated airborne Combatant Data Collection (CDC) data acquisition techniques and signal processing algorithms. Tested/evaluated surface CDC techniques and algorithms in different shallow water environments.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: PROGRAM ELEMENT: 0603785N PROJECT NUMBER: R0120
PROGRAM ELEMENT TITLE: Combat Systems Oceanographic Performance Assessment (CSOPA) PROJECT TITLE: Advanced Environmental Acoustic Support (AEAS)

- (U) ($2,227) Developed a new Mine Warfare tactical decision aid capability to include airborne Mine Counter Measure (MCM) planning and evaluation, electronic environmental data ingest. Evaluated at-sea. Developed Amphibious Warfare tactical decision aid capability to include effects of surf on assault vehicles.

- (U) ($3,277) Completed the prototype trainer high frequency virtual acoustic ocean SSQ-32 stimulator to be use by the Mine and Undersea Warfare (MUW) community.

- (U) ($1,136) Developed critical environmental factors atlases for subsurface platforms in potential regional conflict areas in shallow water operating areas. Investigated potential sources for existing littoral data, acquired and integrated for use with Expeditionary Warfare systems. Evaluated denied area measurement data acquisition concepts and approaches.

2. (U) FY 1996 PLAN:

- (U) ($2,616) Begin advanced development of Extended Echo Range Sonobuoys and Active Distributed Systems. Begin integration and transition of simulations and modeling capabilities to the Navy trainer and simulation communities (PMA-264, NAWC, PEO-A).

- (U) ($1,607) Begin advanced development of MCM tactics and optimization algorithms for Mine Warfare Tactical Decision Aid Library and interface with meteorological and oceanographic data distribution system. Evaluate MIW Real-Time METOC models, databases during fleet exercises. Begin transition to Joint Mine Countermeasure Information System (JMCIS) segments.

- (U) ($3,142) Begin development and conduct at-sea demonstrations of rapid airborne area oceanographic and acoustic characterization techniques. Transition Airborne rapid response capabilities to the Airborne Oceanography Reinvigoration Project. Develop critical environmental factors atlases for surface, MIW and air platforms for potential regional conflict areas. Acquire and develope METOC databases for unique crisis response areas.

- (U) ($136) Portion of extramural program reserved for Small Business Innovative Research assessment in accordance with 15 U.S.C.638.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: PROGRAM ELEMENT: 0603785N PROJECT NUMBER: R0120
PROGRAM ELEMENT TITLE: Combat Systems Oceanographic Performance Assessment (CSOPA) PROJECT TITLE: Advanced Environmental Acoustic Support (AEAS)

3. (U) FY 1997 PLAN:

- (U) ($2,130) Begin METOC models, databases in support of crisis response. Continue integration of ocean and atmosphere representation, including effects on platforms, weapons and sensor systems into DOD simulation systems for mission rehearsal, training and analysis. Begin high fidelity atmosphere for stimulation/acquisition of advanced radar systems used for theater anti-missile and air defense. Evaluate Navy systems performance in surrogate environment and extrapolate to foreign sites of interest. Develop METOC databases for significant operational area of interest.

- (U) ($2,570) Complete verification and validation of rapid real-time data acquisition capabilities in two littoral environments. Transition rapid area characterization techniques to PMA-546 and fleet squadrons. Begin development of airborne-remote METOC data acquisition, data base and modeling capabilities in direct support of crisis response, regional conflicts and peace-time scenarios.

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996 President's Budget:	9,340	7,743	7,324
(U) Adjustments from 1996 PRESBUDG:	0	-242	-2,624
(U) FY 1997 PRESBUDG Submit:	9,340	7,501	4,700

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1996 reduction is due to Congressional undistributed general and inflation reductions (-147); and revised DOD inflation rates and other minor pricing adjustments (-95K). FY 1997 reduction of (-2,408) is due to zero sum realignment of RDT&E,N. Adjustment due to resource sponsor reprogramming to optimize configuration control for tactical decision aids. Additional reductions are due to revised DOD inflation estimates and other minor pricing adjustments (-216K).

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: PROGRAM ELEMENT: 0603785N PROGRAM ELEMENT TITLE: Combat Systems Oceanographic Performance Assessment (CSOPA) PROJECT NUMBER: R0120 PROJECT TITLE: Advanced Environmental Acoustic Support (AEAS)

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

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

(U) RELATED RDT&E:
(U) PE 0205620N (Surface ASW Combat System Integration) - Transition of surface ship CDC efforts.
(U) PE 0602702E (Tactical Technology) - Advanced Research Projects Agency simulation development program.
(U) PE 0603254N (Anti-Submarine Warfare Systems Development) - Environmental support to the Extended Echo Range sonobuoy.
(U) PE 0603502N (Surface and Shallow Water MCM) - Integration of MEDAL into combat systems.

D. (U) SCHEDULE PROFILE: Not applicable.

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: March 1996

BUDGET ACTIVITY:

PROGRAM ELEMENT: 0603785N
PROGRAM ELEMENT TITLE: Combat Systems Oceanographic Performance Assessment (CSOPA)

PROJECT NUMBER: R0120
PROJECT TITLE: Advanced Environmental Acoustic Support (AEAS)

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

Project Cost Categories	FY 1995	FY 1996	FY 1997
a. Software Development	7,687	6,612	4,113
b. Ancillary Hardware Development	0	250	0
c. Development Support Equipment Acquisition	253	0	0
d. Miscellaneous	1,400	639	587
Total	9,340	7,501	4,700

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: March 1996

BUDGET ACTIVITY:

PROGRAM ELEMENT: 0603785N
PROGRAM ELEMENT TITLE: Combat Systems Oceanographic Performance Assessment (CSOPA)

PROJECT NUMBER: R0120
PROJECT TITLE: Advanced Environmental Acoustic Support (AEAS)

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 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Product Development										
SAIC, McLean					0	0	975	200		
NRL, Wash,DC	WR	11/2/93	Cont.	Cont.	9,940	3,500	2,500	500	CONT.	CONT.
Planning Systems Inc., McLean, VA	C/CPFF	05/3/93	Cont.	Cont.	1,985	1,000	2,390	2,300	CONT.	CONT.
Loral, Manassas and Reston, VA	C/CPFF	12/24/92	6,736	6,736	1,690	1,340	600	0	0	4,410
Miscellaneous					6,584	3,500	1,036	1,700	CONT.	CONT.

Support and Management: Not applicable

Test and Evaluation: Not applicable

GOVERNMENT FURNISHED PROPERTY: Not applicable

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: March 1996

BUDGET ACTIVITY:

PROGRAM ELEMENT: 0603785N
PROGRAM ELEMENT TITLE: Combat Systems Oceanographic Performance Assessment (CSOPA)

PROJECT NUMBER: R0120
PROJECT TITLE: Advanced Environmental Acoustic Support (AEAS)

	*Total FY 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Subtotal Product Development	20,199	9,340	7,501	4,700	CONT.	CONT.
Subtotal Support and Management	0	0	0	0	0	0
Subtotal Test and Evaluation	0	0	0	0	0	0
Total Project	20,199	9,340	7,501	4,700	CONT.	CONT.

*R0120 is a continuing program. Only FY 1993 and FY 1994 dollars are shown.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603785N
PROGRAM ELEMENT TITLE: Combat Systems Oceanographic Performance Assessment (CSOPA)

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
R2017 Advanced Underwater Acoustic Modeling Project (AUAMP)	2,162	1,573	1,348	1,550	1,989	2,001	2,012	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: As Navy sonar systems become more sophisticated and their use in shallow water is increasing, there is an urgent and continuing need to understand underwater sound boundary interactions and propagation through the oceanic medium. The shallower waters of the earth's littoral regions are characterized by extreme variability in time as well as space. This project is focused on the development of a family of acoustic models which will predict the performance of existing and future Navy sonar systems. Initial efforts have concentrated upon the development of a multi-source, multi-receiver, Anti-Submarine Warfare (ASW) system performance prediction capability in support of active ASW systems currently being planned and developed for use in the 1990's. Further efforts are directed toward the stochastic prediction of performance of mid- and high-frequency tactical and mine warfare sonars, with an eventual goal of high fidelity simulation.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS:

- (U) ($762) Completed and tested Phase II optimization algorithms for sensor suite line-up guidance. Participated in sea tests.
- (U) ($300) Completed the development of a range dependent active sonar model for surface ship active sonars in a multi-static setting. This will operate 100-3000 Hz and include multi-sources, multi-receivers and a bottom loss data base continuous over this frequency range for active and passive performance.
- (U) ($600) Upgraded bi-static model for use by the Air Community with the SSQ-110 source.

- (U) ($500) Created a major portion of a High Frequency Bottom Loss (HFBL) data base for shallow waters of the western Pacific Ocean.

2. (U) FY 1996 PLAN:

- (U) ($630) Begin development of bottom scattering models for surface Combatant Ships and MUW sonars and incorporate into high frequency system performance model.
- (U) ($190) Verify the range dependent active sonar performance model against data acquired in support of Extended Echo Range sonobuoy and surface ship sonars.
- (U) ($719) Complete HFBL database for shallow waters and develp algorithms for addressing bottom reverberation through advanced algorithm and data processing techniques.
- (U) ($34) Portion of extramural program reserved for Small Business Innovative Research assessment in accordance with 15 U.S.C. 638.

3. (U) FY 1997 PLAN:

- (U) ($552) Verify and validate high and mid-frequency models for surface Combatant Ships and MIW sonar performance predictions.
- (U) ($489) Conduct geo-acoustic data analysis and document high frequency geo-acoustic time series simulations and submit for prototype accreditation.
- (U) ($307) Document range dependent active sonar performance prediction models and submit for accreditation.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603785N PROGRAM ELEMENT TITLE: Combat Systems Oceanographic Performance Assessment (CSOPA) PROJECT NUMBER: R2017 PROJECT TITLE: Advanced Underwater Acoustic Modeling Project

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996 President's Budget:	2,162	1,622	1,573
(U) Adjustments from 1996 PRESBUDG:	0	-49	-225
(U) FY 1997 PRESBUDG Submit:	2,162	1,573	1,348

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1996 reduction is due to Congressional undistributed general and inflation reductions (-30); and revised DOD inflation rates and other minor pricing adjustments (-19). FY 1997 reduction is due to revised DOD inflation estimates and other minor pricing adjustments (-225).

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

(U) OTHER PROGRAM FUNDING SUMMARY: Not applicable.

(U) RELATED RDT&E:

(U) PE 0602435N (Oceanographic and Atmospheric Technology) - Joint efforts in boundary interaction physics.
(U) PE 0603747N (Undersea Warfare Advanced Technology) - Evaluation of ASPM during Critical Sea Tests.

D. (U) SCHEDULE PROFILE: Not applicable.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603785N

PROGRAM ELEMENT TITLE: Combat Systems Oceanographic Performance Assessment (CSOPA)

PROJECT NUMBER: R2017

PROJECT TITLE: Advanced Underwater Acoustic Modeling Project

A. (U) PROJECT COST BREAKDOWN: ($ in thousands): Not applicable.

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

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603785N
PROGRAM ELEMENT TITLE: Combat Systems Oceanographic Performance Assessment (CSOPA)

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
V0823 Sensor Performance Prediction (SPP)	8,135	6,437	7,602	7,899	10,366	10,321	10,497	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The SPP program develops on-board software capabilities that provide sensor performance predictions and Tactical Decision Aids (TDA) for all tactical platforms using in-situ measurements, synoptic data and new/high resolution environmental data bases. SPP maximizes the full performance potential of complex sensor systems by increasing their detection/tracking performance. The program is focused on the development of new combat system and mine warfare performance prediction and tactical decision aid capabilities for highly complex littoral environments to support regional conflict scenarios. It addresses the multi-warfare areas, particularly Mine Warfare, Amphibious Warfare, shallow water ASW and missile and air defense/strike capabilities that are critical to operate in the littoral and hinterland and includes all platforms (i.e. surface, submarine and air).

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS:

- (U) ($2,222) Completed the initial SPP Expeditionary Decision Support capability to ingest and utilize expanded in-situ/synoptic environmental data and non-acoustic detection/counterdetection capabilities specifically for littoral areas. Evaluated at-sea.

- (U) ($2,175) Commenced development of a new Surface Ship SPP ADM capability to include: mine detection/avoidance aids, non-acoustic tactical decision aids and shallow water counterdetection predictions. Initial at-sea test conducted.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603785N PROGRAM ELEMENT TITLE: Combat Systems Oceanographic Performance Assessment (CSOPA) PROJECT NUMBER: V0823 PROJECT TITLE: Sensor Performance Prediction (SPP)

- (U) ($1,850) Developed a prototype Electro-Magnetic performance prediction/TDA system to optimize employment of fleet radars in the highly variable littoral areas against the diesel submarine and low flying missiles. Evaluated at-sea.

- (U) ($1,888) Developed a new Submarine SPP ADM capability to include: performance predictions/line-up support, mine warfare decision aids, all sensor search fusion and optimum weapon preset predictions and Expeditionary Warfare products. Evaluated at-sea.

2. (U) FY 1996 PLAN:

- (U) ($2,720) Initiate development of a Joint Littoral/Multi-Mission TDA for submarine, air and surface ships that will provide an integrated acoustic and non-acoustic combat system performance prediction capability using in-situ and synoptic Meteorological and Oceanographic (METOC) data for the multi-threat, multi-warfare scenario. This system will be tied into the Joint Maritime Command Information System for information connectivity. In addition, it will provide more automated and "event triggered" performance prediction/tactical decision aid capabilities in order to maintain tactical control and address the requirements for reduced manning. Test at-sea.

- (U) ($2,181) Continue the development of the initial Electro-Magnetic/Electro-Optic Performance Prediction/Decision Support System for Anti-Submarine, Anti-Missile and Air Defense/Strike Warfare. Test at-sea.

- (U) ($1,460) Incorporate the prototype Electro-Magnetic and Electro-Optic capabilities into the current surface ship, air and submarine performance prediction system ADM to maximize Expeditionary Warfare decision support in the littoral areas. Test at-sea.

- (U) ($76) Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15 U.S.C.638.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603785N
PROGRAM ELEMENT TITLE: Combat Systems Oceanographic Performance Assessment (CSOPA)

PROJECT NUMBER: V0823
PROJECT TITLE: Sensor Performance Prediction (SPP)

3. (U) FY 1997 PLAN:

- (U) ($2,174) Complete initial development of the Joint Littoral/Multi-Mission TDA capability for use in shallow water against diesel submarines/low flying missiles. Fully integrate the best available METOC Battlespace Analysis including in-situ, remotely sensed, synoptic and climatological data into the Joint Littoral/Multi-Mission TDA. Evaluate at-sea during Fleet Regional Conflict/Littoral exercises.

- (U) ($1,535) Complete development of MCM tactics and optimization algorithms initiated by the AEAS Program (R0120). Begin minefield planning module and amphibious warfare decision support functionality. Incorporate Mine Warfare and Amphibious Warfare capabilities in the Joint Littoral/Multi-Mission TDA. Evaluate at-sea.

- (U) ($1,742) Develop refinements and new capabilities for the Electro-Magnetic/Electro-Optic Performance Prediction/Decision Support System based on initial at-sea use and Fleet feedback. Develop required combat system connectivity to measure systems performance. Test at-sea.

- (U) ($2,151) Develop new functionality for the submarine, air and surface ship ADM to further address the multi-threat, multi-warfare scenarios. This new functionality will include predictions for advanced combat systems, greater use of highly variable in-situ/remotely sensed and synoptic METOC data, increased connectivity/integration with the shipboard tactical decision process and "greater automation/event triggering" to reduce manning requirements. Test at-sea.

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996 President's Budget:	8,135	6,677	6,514
(U) Adjustments from PRESBUDG:	0	-240	+1,088
(U) FY 1997 PRESBUDG Submit:	8,135	6,437	7,602

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603785N
PROGRAM ELEMENT TITLE: Combat Systems Oceanographic Performance Assessment (CSOPA)

PROJECT NUMBER: V0823
PROJECT TITLE: Sensor Performance Prediction (SPP)

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1996 funding reduced due to Congressional undistributed general and inflation reductions (-125); and revised DOD inflation rates and other minor pricing adjustments (-115). Funding has been increased by 1,535K in FY 1997 to provide for the development of tactical decision aids for Mine Warfare and Amphibious Warfare, while also being decreased in FY 1997 for revised DOD inflation estimates and other minor pricing adjustments (-447).

(U) Schedule: Mine Warfare/Amphibious Warfare Tactical Decision Aids will be developed and tested in FY 1997.

(U) Technical: Increased functionality to support Mine and Amphibious Warfare areas. This will provide increased warfighting capability in the littoral.

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

(U) RELATED RDT&E:
(U) PE 0603207N (Air/Ocean Tactical Applications)
(U) PE 0603504N (Advanced Submarine Combat Systems Development)
(U) PE 0603553N (Surface ASW)
(U) PE 0604218N (Air/Ocean Equipment Engineering)

D. (U) SCHEDULE PROFILE: See Attached.

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FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603790N
PROGRAM ELEMENT TITLE: NATO Cooperative Research and Development

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
R2293 NATO Cooperative Research and Development (R&D)	0	0	9,933	10,172	7,421	7,965	8,579	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project provides funding for the continuation of on-going research and development projects that were initiated between the U.S. Navy and allies under the Office of the Secretary of Defense (OSD) NATO Cooperative Research and Development (R&D) program (Program Element (P.E.) 0603790D) in prior years. Each year OSD will provide seed money to initiate worthy R&D projects for which the Navy will provide continuation funding from this P.E. until follow-on funding for the project is identified.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under DEMONSTRATION & VALIDATION because it develops and integrates hardware for experimental tests related to specific ship or aircraft applications.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS: Not applicable.

2. (U) FY 1996 PLAN: Not applicable.

3. (U) FY 1997 PLAN:
   - (U) ($4,183) Support on-going work related to the U.S./United Kingdom development of the Intercooled Recuperated Gas Turbine Engine.
   - (U) ($3,000) Support on-going Navy efforts on the U.S./Japanese Cooperative Material Project for Advanced Steel.
   - (U) ($1,150) Support on-going Navy efforts on the U.S./German joint project on Computer Codes for Predicting Underwater Explosion Effects.
   - (U) ($800) Support on-going work on the U.S./Norway joint project on Composite Hull Embedded Sensor System.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603790N PROJECT NUMBER: R2293
PROGRAM ELEMENT TITLE: NATO Research and Development PROJECT TITLE: NATO Cooperative R&D

- (U) ($800) Support on-going work on the U.S./Norway joint project on Composite Hull Embedded Sensor System.

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996 President's Budget:	0	0	0
(U) Adjustments from FY 1996 PRESBUDG:	0	0	+9,933
(U) FY 1997 PRESBUDG Submit:	0	0	9,933

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1997 adjustment is due to the establishment of a Navy Cooperative R&D program element (+10,233) and revised economic assumptions (-300).

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

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

(U) RELATED RDT&E:
(U) PE 0603790D (NATO Cooperative Research and Development)
(U) PE 0605853N (Management, Technical and International Support)
(U) PE 0605130D (Foreign Comparative Testing)

D. (U) SCHEDULE PROFILE: Not applicable.

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603790N PROJECT NUMBER: R2293
PROGRAM ELEMENT TITLE: NATO Research and Development PROJECT TITLE: NATO Cooperative R&D

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

Project Cost Categories	FY 1995	FY 1996	FY 1997
a. NATO Cooperative Research and Development	0	0	9,933
Total	0	0	9,933

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

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603790N
PROGRAM ELEMENT TITLE: NATO Research and Development

PROJECT NUMBER: R2293
PROJECT TITLE: NATO Cooperative R&D

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FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603795N
PROGRAM ELEMENT TITLE: Gun Weapons Systems Technology

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
S2156 Naval Surface Fire Support	18,862	32,958	42,204	48,190	44,252	40,246	32,259	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Naval Surface Fire Support (NSFS) Mission will be met near term by gun, missile and C4I weapons systems. The NSFS Program Office will acquire all gun related systems in order to meet the range, accuracy, and lethality requirements of the Mission Needs Statement dated 11 May 1992. Gun related systems are to include: a 5" MK 45 modification, a 5" extended range guided munitions with an internal Global Positioning System (GPS) receiver and Inertial Navigation System (INS) coupled guidance system delivering a submunition payload to targets at ranges exceeding 41 NM to be known as the EX-171 Hammer (formerly Precision Guided Munition (PGM)), a gun fire control system and some ballistic ammunition improvements. Missile related systems include a ship launched strike missile reaching out to 150 NM. Both gun and missile weapons will require a C4I system of commensurate capability. These combined weapon systems will provide the required standoff capability to safely destroy shore targets. Technologies which have been developed and funded by other agencies are being leveraged, not only as a means to determine near term benefits to surface combatants, but with the goal of ensuring that all existing and emerging technologies are maximally exploited. The program will provide critical NSFS capabilities necessary to support all phases of amphibious operations. The Acquisition Decision Memorandum (November 1992) approved initiation of program Phase 0.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under DEMONSTRATION & VALIDATION because it develops and integrates hardware for experimental test related to specific ship or aircraft applications.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603795N PROJECT NUMBER: S2156
PROGRAM ELEMENT TITLE: Gun Weapons PROJECT TITLE: Naval Surface Fire Support Systems Technology

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS:
   - (U) ($1,100) Developed 40" barrel extension and test hardware.
   - (U) ($2,752) Continued contract preparation for 5" MK 45 Modification.
   - (U) ($5,190) Prepared for EX-171 MS I/II and conducted EX-171 risk reduction efforts. Awarded contract to design/demonstration of prototype vehicle guidance, navigation and control concept.
   - (U) ($8,300) Awarded contract to design/demonstration of prototype vehicle guidance, navigation and control concept.
   - (U) ($1,520) Evaluated performance of advanced solid propellant concepts for FY 96 development of EX-171 propelling charge.

2. (U) FY 1996 PLAN:
   - (U) ($15,100) Award Contract for EX-171 EDMs and in-house EX-171 support.
   - (U) ($12,000) Completed Milestone II for the 5" MK 45 Modification. Award contract for 5" MK 45 Modification.
   - (U) ($2,095) Continue EX-171 Advanced Solid Propellant (ASP) charge. Test and evaluation of alternative explosives for the Army XM80 submunition to meet Navy Insensitive Munition requirements.
   - (U) ($122) Develop 5" MK 45 Modification Gun Fire Control.
   - (U) ($3,000) Conduct EX-171 Risk Mitigation efforts
   - (U) ($641) Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15 U.S.C. 638.

3. (U) FY 1997 PLAN:
   - (U) ($12,000) Award contract option for EX-171 EDMs.
   - (U) ($2,500) Develop EX-171 Advanced Solid Propellant Charge.
   - (U) ($1,000) Preparation of EX-171 preliminary technical documentation and planning, including logistics documentation.
   - (U) ($4,500) Perform EX-171 component testing.
   - (U) ($1,000) Complete EX-171 Preliminary Design Review and Critical Design Review.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603795N PROJECT NUMBER: S2156
PROGRAM ELEMENT TITLE: Gun Weapons PROJECT TITLE: Naval Surface Fire Support Systems Technology

- (U) ($9,200) Exercise Contract Option for 5" MK 45 Modification and GFP preparation.
- (U) ($2,729) Continue test support for 5" MK 45 Modification.
- (U) ($2,000) Continue ballistic projectile qualification for 5" MK 45 Modification.
- (U) ($1,500) Continue 5" MK 45 Modification Conventional propellant charge qualification.
- (U) ($1,775) Conduct 5" MK 45 Modification system interface (Fire Control and Ammunition).
- (U) ($2,000) Continue development of 5" MK 45 Modification Gun Fire Control.
- (U) ($2,000) Procure Test Equipment for 5" MK 45 Program.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603795N PROJECT NUMBER: S2156
PROGRAM ELEMENT TITLE: Gun Weapons PROJECT TITLE: Naval Surface Fire Support Systems Technology

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996 President's Budget:	19,075	12,028	27,601
(U) Adjustments from PRESBUDG:	-213	+20,930	+14,603
(U) FY 1997 PRESBUDG Submit:	18,862	32,958	42,204

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: Decrease of $213 in FY 1995 is a result of program undistributed general reduction. Increase of $20.9M in FY 96 provides for acceleration of IOC prior to FY 2001 for NSFS in accordance with CNO direction of December 1994 as well as providing for EX-171 risk mitigation efforts. Increase in FY 1997 of $14.6M provided to accelerate ACAT II EX-171 development in addition to ACAT III 5" MK 45 Modification to comply with CEB Decision of December 1994.

(U) Schedule: Program accelerated to achieve IOC prior to FY 2001 by CNO direction.

(U) Technical: N/A

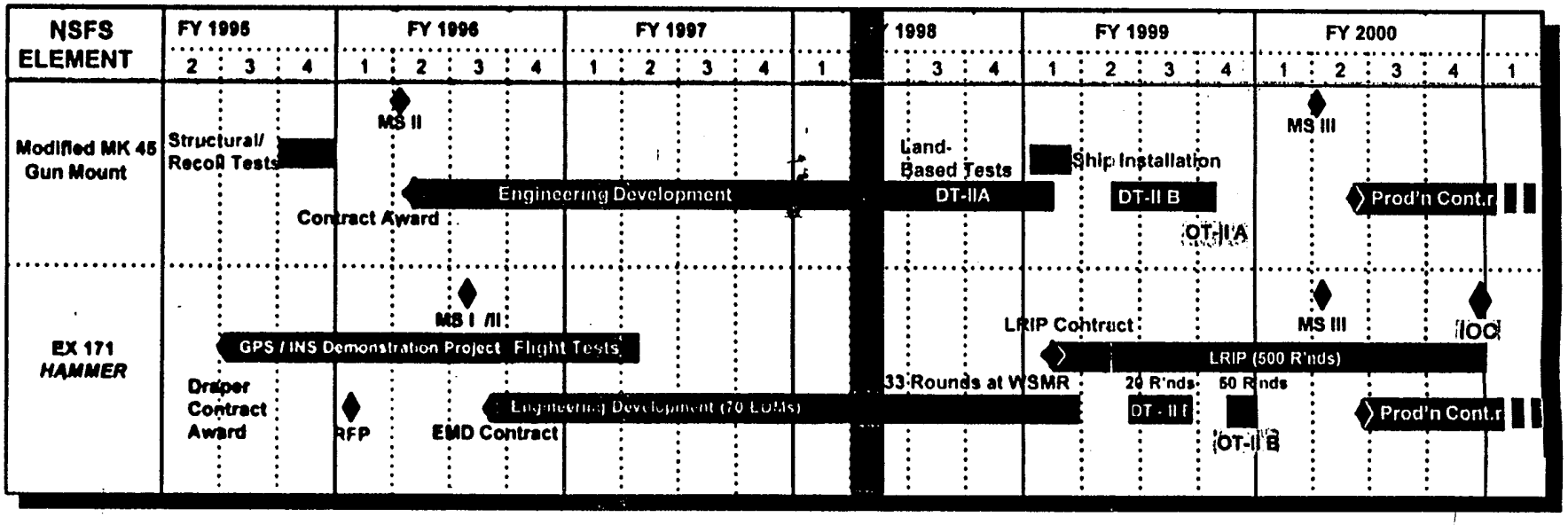
C. (U) OTHER PROGRAM FUNDING SUMMARY: Not applicable.

(U) RELATED RDT&E: Not applicable.

D. (U) SCHEDULE PROFILE: See Attachment "A".

PROGRAM ELEMENT: 0603795N
PROJECT: S2156

Integrated Program Schedule



- MK 45 Gun Mod Sole Source Contract Award for 3 Gun ORDALTS, Feb 96
  - Land Based Tests, Jan 98
  - Ship Installation, Oct 99
  - Shipboard DT/OT Tests, Feb 99
  - Production Contract to meet DDG Production Schedule, Mar 00
- EX 171 Extended Range Guided Munition Competitive Contract Award for 70 EDMs, Aug 96
  - ERGM Demo by Nov 96
  - Land Based Tests, Jan 98
  - Low Rate Initial Production (500 Rounds), Nov 98
  - Shipboard DT/OT Tests, Mar 99
  - Full Rate Production 1000 Rounds, Mar 00
- Gun Mod - ERGM come together for DT-IIA Land Based Tests Jan 98 (as indicated by red vertical bar)

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603795N PROJECT NUMBER: S2156
PROGRAM ELEMENT TITLE: Gun Weapons PROJECT TITLE: Naval Surface Fire Support Systems Technology

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

Project Cost Categories	FY 1995	FY 1996	FY 1997
a. Primary Hardware Development	11,481	20,145	30,636
b. Ancillary Hardware Development	820	1,440	3,626
c. Government Engineering	3,610	6,034	6,097
d. Systems Engineering	2,296	4,028	1,648
e. Miscellaneous	655	1,311	197
Total	18,862	32,958	42,204

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603795N PROJECT NUMBER: S2156
PROGRAM ELEMENT TITLE: Gun Weapons PROJECT TITLE: Naval Surface Fire Support Systems 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 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Product Development										
NSWC DAHLGREN,VA	WR	VAR	CONT.	CONT.	5,225	8,104	3,577	8,500	CONT.	CONT.
NSWC DAHLGREN,VA	RC	VAR	CONT.	CONT.	1,452	1,121	0	0	CONT.	CONT.
NSWC CRANE,IN	WR	VAR	CONT.	CONT.	8,363	1,250	1,691	2,592	CONT.	CONT.
NSWC CRANE,IN	RC	VAR	7,181	7,181	7,181	0	0	0	0	7,181
NSWC ANNAPOLIS,MD	WR	VAR	CONT.	CONT.	2,000	0	0	0	CONT.	CONT.
NSWC ANNAPOLIS,MD	RC	VAR	CONT.	CONT.	600	0	0	0	CONT.	CONT.
NSWC INDIAN HD,MD	WR	VAR	CONT.	CONT.	1,691	1,520	1,057	2,097	CONT.	CONT.
NSWC INDIAN HD,MD	RC	VAR	CONT.	CONT.	0	0	0	0	CONT.	CONT.
NSWC PORT HUE,CA	WR	VAR	CONT.	CONT.	0	250	300	515	CONT.	CONT.
UNITED DEFENSE, MINNEAPOLIS,MN	CP	VAR	CONT.	CONT.	0	300	12,000	17,000	CONT.	CONT.
TBD-EX-171	C	VAR	CONT.	CONT.	0	0	11,000	11,000	CONT.	CONT.
MARTIN-MARIETTA PHILADELPHIA,PA	CPFF	06/94	1,435	1,435	1,435	0	0	0	0	1,435
DRAPER LABS, BOSTON, MA	PD	VAR	CONT.	CONT.	537	5,000	3,000	0	CONT.	CONT.
JOHNS HOPKINS LAUREL, MD	PD	VAR	1,800	1,800	1,800	0	0	0	0	1,800
MCDONNELL DOUGLAS ST. LOUIS, MO.	PD	VAR	3,000	3,000	3,000	0	0	0	0	3,000

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603795N PROJECT NUMBER: S2156
PROGRAM ELEMENT TITLE: Gun Weapons PROJECT TITLE: Naval Surface Fire Support Systems Technology

(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 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Product Development										
TBD-GUN FIRE CONTROL SYSTEM	CP	VAR	CONT.	CONT.	0	0	0	0	CONT.	CONT.
TBD-COMMAND/ COMMUNICATIONS	CP	VAR	CONT.	CONT.	0	0	0	0	CONT.	CONT.
MISCELLANEOUS	VAR	VAR	CONT.	CONT.	4,492	1,317	333	500	CONT.	CONT.
Support and Management					0	0	0	0	0	0
Test and Evaluation					0	0	0	0	0	0

GOVERNMENT FURNISHED PROPERTY - Not applicable.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: March 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0603795N PROJECT NUMBER: S2156
PROGRAM ELEMENT TITLE: Gun Weapons PROJECT TITLE: Naval Surface Fire Support Systems Technology

	FY 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Subtotal Product Development	37,776	18,862	32,958	42,204	CONT.	CONT.
Subtotal Support and Management	0	0	0	0	0	0
Subtotal Test and Evaluation	0	0	0	0	0	0
Total Project	37,776	18,862	32,958	42,204	CONT.	CONT.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603800N PROJECT NUMBER: D2209
PROGRAM ELEMENT TITLE: JOINT ADVANCED STRIKE TECHNOLOGY (JAST) PROGRAM PROJECT TITLE: JASTP

(U) COST (Dollars in thousands)

PROJECT NUMBER TITLE	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
D2209 JASTP	98,272	81,215	246,833	421,848	457,300	238,979	18,892	0	1,592,855

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The JAST Program is the focal point for defining affordable next generation strike aircraft weapon systems for the USN, USMC, USAF and allies. Program emphasis is on facilitating the evolution of fully validated and affordable joint operational requirements, and demonstrating cost leveraging technologies and concepts to lower risk prior to entering Engineering and Manufacturing Demonstration (E&MD) of the Joint Strike Fighter (JSF) in FY 2001. The JAST Program is a joint program with no executive service. Navy and Air Force each provide approximately equal shares of annual funding for the program effective in FY 1995. The Advanced Research Projects Agency (ARPA) and the United Kingdom (UK) contribute funding effective in FY 1996.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under DEMONSTRATION & VALIDATION because it integrates hardware for test related to specific ship or aircraft applications.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS: (Breakout reflects combined Navy and Air Force funding)

- (U) ($ 54,822) Commenced Concept Development Phase with electronic award of multiple contracts for concept definition and design research, including contractor cost and performance trades, for weapon system concepts for a family of aircraft that meets the needs of the USN, USAF, and USMC affordably; and commenced affordability assessments.

- (U) ($ 72,317) Commenced technology maturation concept definition and design research; conducted demonstrations and assessments in the areas of structures and materials, flight systems, manufacturing/producibility, propulsion, avionics, weapons integration and supportability.

- (U) ($ 7,053) Continued strategy-to-task analysis and strike warfare demonstrations and assessments to facilitate the Services' joint requirements definition; activity culminated in Joint Initial Requirements Document (JIRD) endorsed by the USN, USAF and USMC and briefed to the Joint Requirements Oversight Council (JROC).

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603800N PROJECT NUMBER: D2209
PROGRAM ELEMENT TITLE: JOINT ADVANCED STRIKE TECHNOLOGY (JAST) PROGRAM PROJECT TITLE: JASTP

- (U) ($ 37,653) Continued ASTOVL Phase II risk mitigation efforts begun by ARPA, integrated with JAST Program Concept Development tasks.

- (U) ($ 3,284) Conducted modeling and simulation activities to support strike warfare mission area analysis.

- (U) ($ 6,923) Supported program operations, including program office functions.

2. (U) FY 1996 PLAN: (Breakout reflects Navy, Air Force, ARPA and UK funding)

- (U) ($ 60,830) Complete concept definition and design research for weapon system concepts for a tri-service family of aircraft; receive contractors' preferred weapon system concepts and recommended development and demonstration plans; and continue affordability analyses.

- (U) ($119,440) Complete technology maturation concept definition and design research; continue demonstrations and assessments in the areas of structures and materials, flight systems, manufacturing/producibility, propulsion (including competitive engine efforts), avionics, weapons integration and supportability.

- (U) ($ 6,201) Continue strategy-to-task analysis and strike warfare demonstrations and assessments to facilitate the Services' joint requirements definition.

- (U) ($ 3,438) Continue modeling and simulation activities to support strike warfare mission area analysis.

- (U) ($ 5,502) Complete ASTOVL risk mitigation efforts, integrated with JAST Program Concept Development tasks.

- (U) ($ 6,391) Support program operations, including program office functions.

- (U) ($ 4,348) USN Portion of program reduced for transfer to Small Business Innovation Research assessment in accordance with 15 U.S.C. 638 and USN/ARPA general reductions.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603800N PROJECT NUMBER: D2209
PROGRAM ELEMENT TITLE: JOINT ADVANCED STRIKE TECHNOLOGY (JAST) PROGRAM PROJECT TITLE: JASTP

3. (U) FY 1997 PLAN: (Breakout reflects Navy, Air Force, ARPA and UK funding)

• (U) ($461,642) Commence Concept Demonstration Phase including flying aircraft concept demonstrators as well as unique ground and flight demonstrations. This phase commences with the competitive award of two contracts for ground and flight demonstrations and continued concept refinement for a tri-service family of aircraft that meets the Services' needs and optimizes commonality among the variants to minimize life cycles costs (LCC); award contract for supporting propulsion efforts; and continue affordability analyses.

• (U) ($ 6,700) Continue strategy-to-task analysis and strike warfare demonstrations and assessments to facilitate the Services' joint requirements definition.

• (U) ($ 6,500) Continue modeling and simulation activities to support strike warfare mission area analysis.

• (U) ($178,839) Continue technology maturation demonstrations and assessments in the areas of structures and materials, flight systems, manufacturing/producibility, propulsion (including competitive engine efforts), avionics, weapons integration and supportability.

• (U) ($ 6,388) Support program operations, including program office functions.

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997	Total Cost
(U) FY 1996/1997 President's Budget:	$98,272	$149,295	$199,305	$1,375,231
(U) Adjustments from PRESBUDG:	0	-68,080	+$47,528	+$217,624
(U) FY 1997 President's Budget:	$ 98,272	$ 81,215	$246,833	$1,592,855

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY 1996 decrease reflects FY 1996 Appropriations Conference action due to program restructure (-$65,500 thousand); Congressional undistributed general and inflation reductions (-$1,974 thousand) and Defense Business Operating Fund (DBOF) related adjustment(-$606 thousand). The FY 1997 increase reflects FY 1996 Appropriations Conference action due to program restructure (+$66,000); DBOF related adjustments (-$17,997 thousand); DOD inflation adjustment (-$42 thousand) and minor pricing adjustments(-$433 thousand).

(U) Schedule: Commencement of the Concept Demonstration Phase was delayed from FY 1996 to early FY 1997 due to restructuring of the program.

(U) Technical: Not applicable.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603800N PROJECT NUMBER: D2209
PROGRAM ELEMENT TITLE: JOINT ADVANCED STRIKE TECHNOLOGY (JAST) PROGRAM PROJECT TITLE: JASTP

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands) This is a joint program with no executive service. The United Kingdom is a full collaborative partner in the JAST Program. A Memorandum of Understanding (MOU) was signed in December 1995.

	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
(U)RDT&E 0603800F	83,780	81,154	263,836	431,057	458,527	238,860	18,800	0	1,576,014
(U)RDT&E 0603800E	0	29,781	78,400	23,922	0	0	0	0	132,103
(U)United Kingdom	0	14,000	71,000	55,000	20,000	20,000	20,000	0	200,000

(U) RELATED RDT&E:
Milestone II for a joint follow-on E&MD program for the Joint Strike Fighter (JSF) is planned to commence in FY 2001. The follow-on program will develop a tri-service family of aircraft from concepts proven under the JAST Program, incorporating affordable technologies transitioned from the JAST Program.

	FY 1995 ACTUAL	FY 1996 ESTIMATE	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
(U)RDT&E 0604800F:	0	0	0	0	0	0	436,314	TBD	TBD*
(U)RDT&E 0604800N:	0	0	0	0	0	281	439,000	TBD	TBD*

* Total E&MD cost will be determined prior to the start of Milestone II (FY 2000)

D. (U) SCHEDULE PROFILE:
Dec 94 Commenced Concept Development Phase
Mar 96 Released RFP for Concept Demonstration Phase
Fall 96 Planned Award of Concept Demonstration Phase Contracts

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FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603800N PROJECT NUMBER: D2209
PROGRAM ELEMENT TITLE: JOINT ADVANCED STRIKE TECHNOLOGY (JAST) PROGRAM PROJECT TITLE: JASTP

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

Project Cost Categories	FY 1995	FY 1996	FY 1997
a. Strike Warfare Systems Design Development	54,822	60,830	
b. Weapon System Concept Demonstrations (including flying demonstrations)			461,642
c. ASTOVL	37,653	5,502	
d. Structures and Material	5,384	10,927	34,100
e. Flight Systems	11,258	31,377	38,400
f. Manufacturing and Producibility	5,077	5,620	5,000
g. Propulsion	19,099	42,907	57,000
h. Avionics	17,958	21,049	32,309
i. Weapons Integration	7,606	3,030	3,480
j. Supportability	4,744	3,501	6,350
k. Technology Integration Planning Support	1,191	1,029	2,200
l. Requirements Analysis	7,053	6,201	6,700

000519

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4
PROGRAM ELEMENT: 0603800N
PROGRAM ELEMENT TITLE: JOINT ADVANCED STRIKE TECHNOLOGY (JAST) PROGRAM
PROJECT NUMBER: D2209
PROJECT TITLE: JASTP

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

Project Cost Categories (Contd)	FY 1995	FY 1996	FY 1997
m. Modeling, Simulation and Analyses	3,284	3,438	6,500
n. Program Operations	6,923	6,391	6,388
o. USN SBIR Assessment and USN/ARPA General Reductions		4,348	
Total	182,052	206,150	660,069

*Funding Resources			
PE 0603800N (Navy)	98,272	81,215	246,833
PE 0603800F (Air Force)	83,780	81,154	263,836
PE 0603800E (ARPA)	0	29,781	78,400
United Kingdom	0	14,000	71,000
Total	182,052	206,150	660,069

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603800N PROJECT NUMBER: D2209
PROGRAM ELEMENT TITLE: JOINT ADVANCED STRIKE TECHNOLOGY (JAST) PROGRAM PROJECT TITLE: JASTP

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION ($ in thousands) No budget in FY 1993 and Prior.

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
PRODUCT DEVELOPMENT (This is a technology demonstration program, not an acquisition program.)										
Strike Warfare Concept Studies										
Lockheed Ft. Worth, TX	C/CPFF	May 94	2,000	2,000	2,000					2,000
Boeing Seattle, WA	C/CPFF	May 94	2,200	2,200	2,200					2,200
McAIR St. Louis, MO	C/CPFF	May 94	1,700	1,700	1,700					1,700
Fld Activ.	Various	May 94	5,567	5,567	5,567					5,567
Strike Warfare Systems Design Development										
Boeing	C/CPFF	Dec 94	32,770	32,770		14,140	18,630			32,770
McAIR	C/CPFF	Dec 94	23,708	23,708		14,393	9,315			23,708
Northrup Pico Rivera, CA	C/CPFF	Dec 94	21,358	21,358		12,043	9,315			21,358
Lockheed	C/CPFF	Dec 94	28,580	28,580		9,950	18,630			28,580
Contracts Less Than $1.0M										
Various	C/CPFF	Oct94-Sep95	821	821		821				821
Fld Activ.	Various	Oct94-Sep95	7,915	7,915		3,475	4,440			7,915
Weapon System Concept Demonstrations (including flying demonstrators)										
Concept X	C/CPFF	Oct 96	1,100,000	1,100,000*				207,739	CONT.	CONT.
Concept Y	C/CPFF	Oct 96	1,100,000	1,100,000*				207,739	CONT.	CONT.
Fld Activ.	Various	Oct96-Sep97	-	-				45,559	CONT.	CONT.

*includes government managed equipment.

000521

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603800N PROJECT NUMBER: D2209
PROGRAM ELEMENT TITLE: JOINT ADVANCED STRIKE TECHNOLOGY (JAST) PROGRAM PROJECT TITLE: JASTP

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
ASTOVL										
McAIR	SS/CPFF	Oct 94	9,350	9,350		9,350				9,350
Lockheed	SS/CPFF	Oct 94	16,416	16,416		14,067	2,349			16,416
Boeing	SS/CPFF	Jan 95	11,200	11,200		8,047	3,153			11,200
ARPA	MIPR	Jan 95	3,664	3,664		3,664				3,664
Fld. Activ.	Various	Oct94-Sep95	2,525	2,525		2,525				2,525
Technology Maturation Concept Exploration Phase										
Fld. Activ.	Various	Jul 94	3,432	3,432	3,432					3,432
Technology Maturation Concept Development and Demonstration Phases										
Structures and Material										
Boeing	C/CPFF	Dec 94	1,757	1,757		887	870			1,757
McAIR	SS/CPFF	Dec 94	5,740	5,740		3,300	2,440			5,740
McAIR	SS/CPFF	Apr 96	78,000	78,000			6,660	32,817	CONT.	CONT.
Fld Activ.	Various	Oct96-Sep97	-	-		1,137	957	1,223	CONT.	CONT.
Flight Systems										
Northrup	SS/CPFF	Feb 95	1,270	1,270		1,270				1,270
Lockheed	C/CPFF	Oct 96	47,992	47,992		740	13,750	16,600	16,902	47,992
McAIR	C/CPFF	Oct 96	64,821	64,821		1,186	13,515	16,600	33,520	64,821
Boeing	C/CPFF	Oct 96	1,966	1,966		50	500	400	1,016	1,966
Contracts Less Than $1.0M										
Various	CPFF	Various	5,077	5,077		5,077				5,077
Fld Activ.	Various	Oct96-Sep97	-	-		2,655	3,512	4,700	CONT.	CONT.

000522

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603800N PROJECT NUMBER: D2209
PROGRAM ELEMENT TITLE: JOINT ADVANCED STRIKE TECHNOLOGY (JAST) PROGRAM PROJECT TITLE: JASTP

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Manufacturing & Producibility										
Lockheed	C/CPFF	Oct 96	5,632	5,632		1,397	1,500	2,100	635	5,632
MCAIR	C/CPFF	Jan 97	9,751	9,751		1,581	1,270	1,300	5,600	9,751
General Res. Corp Huntsville AL	C/CPFF	Jan 96	1,955	1,955		465	1,490			1,955
Contracts Less Than $1.0M										
Various	CPFF	Various	-	-		555	275	690	CONT.	CONT.
Fld Activ.	Various	Oct96-Sep97	-	-		1,069	985	810	CONT.	CONT.
Propulsion										
GE Cincinnati, OH	SS/CPFF	Dec 94	3,807	3,807		2,731	1,076			3,807
GE	SS/CPFF	Jan 95	5,845	5,845		5,808	37			5,845
Pratt/Whit. West Palm Beach, FL	C/CPFF	Dec 94	5,448	5,448		4,212	1,236			5,448
Pratt/Whit.	SS/CPFF	Jan 95	5,681	5,681		4,331	1,350			5,681
GE	SS/CPFF	Oct 96	65,000	65,000			7,000	15,000	CONT.	CONT.
Pratt/Whit.	SS/CPFF	Nov 95	30,000	30,000			30,000			30,000
Pratt/Whit.	SS/CPFF	Oct 96	88,550	88,550				40,000	CONT.	CONT.
Contracts Less Than $1.0M										
Various	CPFF	Various	1,919	1,919		1,343	576			1,919
Fld Activ.	Various	Oct96-Sep97	-	-		674	1,607	1,975	CONT.	CONT.
Avionics										
Northrup	C/CPFF	Dec 94	1,913	1,913		1,609	304			1,913
Boeing	C/CPFF	Dec 94	2,288	2,288		1,517	771			2,288
TI Plano, TX	C/CPFF	Dec 94	2,464	2,464		1,413	1,051			2,464

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603800N PROJECT NUMBER: D2209
PROGRAM ELEMENT TITLE: JOINT ADVANCED STRIKE TECHNOLOGY (JAST) PROGRAM PROJECT TITLE: JASTP

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Avionics (Cont'd)										
Lockheed	SS/CPFF	Oct 96	7,340	7,340		740	2,100	2,250	2,250	7,340
Lockheed	C/CPFF	Dec 94	2,016	2,016		2,016				2,016
TRW Beavercreek, OH	C/CPFF	Dec 94	2,004	2,004		1,220	784			2,004
McAIR	SS/CPFF	Oct 96	7,340	7,340		740	2,100	2,250	2,250	7,340
Hughes Los Angeles,	C/CPFF	Oct 96	54,618	54,618			4,653	8,619	41,346	54,618
Westinghouse Baltimore, MD	C/CPFF	Oct 96	48,164	48,164			4,288	7,660	36,216	48,164
New Contract	C/CPFF	Jan 97	65,400	65,400				7,709	CONT.	CONT.
Contracts Less Than $1.0M										
Various	CPFF	Oct94-Sep95	7,184	7,184		5,725	1,459			7,184
Fld Activ.	Various	Oct96-Sep97	-	-		2,978	3,474	3,756	CONT.	CONT.
Weapons Integration										
Hughes Los Angeles, CA	C/CPFF	Oct 96	4,228	4,228		1,019	1,609	1,600		4,228
Loral Orlando, FL	C/CPFF	Mar 95	636	636		636				636
Marietta Orlando, FL	C/CPFF	Mar 95	545	545		545				545
Northrup	C/CPFF	Mar 95	426	426		426				426
Westinghouse	C/CPFF	Mar 95	1,011	1,011		1,011				1,011
Contracts Less Than $1.0M										
Various	CPFF	Oct96-Sep97	-	-		901	93	80	CONT.	CONT.
Fld Activ.	Various	Oct96-Sep97	-	-		3,068	1,328	1,800	CONT.	CONT.
Supportability and Training										
Classified Project 3	C/CPFF	Jan 97	9,370	9,370		770	1,600	3,000	4,000	9,370

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0603800N PROJECT NUMBER: D2209
PROGRAM ELEMENT TITLE: JOINT ADVANCED STRIKE TECHNOLOGY (JAST) PROGRAM PROJECT TITLE: JASTP

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Supportability and Training (Cont'd)										
Project 4	C/CPFF	Jan 97	4,800	4,800		800	600	2,000	1,400	4,800
Contracts Less Than $1.0M										
Various	CPFF	Oct94-Sep95	2,314	2,314		1,914	400			2,314
Fld Activ.	Various	Oct96-Sep97	-	-		1,012	901	1,350	CONT.	CONT.
Technical Maturation Technical Support										
Fld Activ.	Various	Oct 96	-	-		1,191	1,029	2,200	CONT.	CONT.
Requirements Analysis										
Dynamic Res.	C/CPFF	Dec 96	1,010	1,010			660	350	CONT.	CONT.
Contracts Less Than $1.0M										
Various	CPFF	Oct96-Sep97	-	-	705	4,647	3,153	3,050	CONT.	CONT.
Fld Activ.	Various	Oct96-Sep97	-	-	3,444	2,405	1,888	2,800	CONT.	CONT.
Modeling, Simulation and Affordability Analyses										
Contracts Less Than $1.0M										
Various	CPFF	Oct96-Sep97	-	-		2,384	824	2,425	CONT.	CONT.
Fld Activ.	Various	Oct96-Sep97	-	-		900	2,614	4,075	CONT.	CONT.
Program Operations										
Fld Activ.	Various	Oct96-Sep97	-	-	3,168	2,251	2,494	2,408	CONT.	CONT.
SUPPORT AND MANAGEMENT (CS)										
ANSER Arlington, VA	SS/CPFF	Jul 94	9,532	9,532	2,100	4,092	3,340		0	9,532
New contract	C/CPFF	Jan 97	-	-				3,410	CONT.	CONT.
Contracts Less Than $1.0M										
Various	CPFF	Oct96-Sep97	-	-	5,200	1,179	1,847	2,025	CONT.	CONT.

TEST AND EVALUATION: N/A

000525

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: March 1996

BUDGET ACTIVITY: 4
PROGRAM ELEMENT: 0603800N
PROGRAM ELEMENT TITLE: JOINT ADVANCED STRIKE TECHNOLOGY (JAST) PROGRAM
PROJECT NUMBER: D2209
PROJECT TITLE: JASTP

GOVERNMENT FURNISHED PROPERTY

Item Description	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Delivery Date	Total FY 1994 & Prior	FY 1995 Budget	FY 1996 Budget	FY 1997 Budget	To Complete	Total Program
Product Development:		N/A							
Support and Management:		N/A							
Test and Evaluation:		N/A							
Subtotal Product Development				22,216	176,781	196,615	654,634	CONT.	CONT.
Subtotal Support and Management				7,300	5,271	5,187	5,435	CONT.	CONT.
USN SBIR Assessment and USN/ARPA General Reductions						4,348			4,348
Subtotal Test and Evaluation				0	0	0	0	0	0
Total Project				29,516	182,052	206,150	660,069	CONT.	CONT.

000526

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: MARCH 1996

BUDGET ACTIVITY: 4

PROGRAM ELEMENT: 0604707N
PROGRAM ELEMENT TITLE: SEW Architecture/Eng Support

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ACTUAL	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
X0798 OTH Targeting	1,733	1,844	1,444	1,671	1,876	1,874	1,917	Cont.	Cont.
X2144 SEW Engineering	4,208	3,624	3,768	3,904	4,911	4,912	5,025	Cont.	Cont.
TOTAL	5,941	5,468	5,212	5,575	6,787	6,786	6,942	Cont.	Cont.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This Program Element (PE) contains two projects: Over-the-Horizon (OTH) Targeting and Space and Electronic Warfare (SEW) Engineering. Both projects are systems engineering non-acquisition programs with the objectives of developing, testing and validating a Naval Battle Force Information Architecture (NBFIA) to support naval missions in Joint and Coalition Theater. The mission of this program element is carried out by multiple tasks that are used to ensure Naval Command, Control, Communications, Computers and Intelligence (C^4I), Surveillance, and Command and Control Warfare (C^2W) components of SEW are effectively integrated into the NBFIA planning. The Program additionally ensures that (1) the composite operational capabilities of SEW systems (not the individual component systems) conform to the NBFIA as related to the objectives of National Defense Strategy and evolving joint visions and direction, such as "COPERNICUS...Forward", "Forward...From the Sea" and C^4I For the Warrior, the Defense Science Board Summer Study Task Force on Information Architecture for the Battlefield and are guided by CINC requirements; and (2) that SEW systems and systems integration effort involves leading-edge technology transfer of information processing technologies primarily through integration of government and commercial off-the-shelf (COTS/GOTS) products to enhance the Navy's operational capability, interoperability, flexible reconfiguration, as well as reduce costs.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: MARCH 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0604707N PROJECT NUMBER:X0798
PROGRAM ELEMENT TITLE: SEW Architecture/Eng Support PROJECT TITLE: OTH Targeting

(U) COST: (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ACTUAL	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
X0798 OTH Targeting	1,733	1,844	1,444	1,671	1,876	1,874	1,917	Cont.	Cont.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Over-the-Horizon Targeting (OTH-T) project line (X0798) supports prototyping and engineering activities critical to the development of operational capabilities to target TOMAHAWK and HARPOON cruise missiles beyond the sensor range of the launch platforms. Specifically, to: Demonstrate enhanced capability to integrate sensor data using prototype onboard sensor interface systems, and provide that infor-mation via UHF satellite communications to: (1) the Force Over-the-Horizon Track Coordinator (FOTC) for input into the common tactical/operational picture, and (2) to TOMAHAWK and HARPOON cruise missile targeting systems. These efforts resulted in the OUTLAW HUNTER-configured P-3 aircraft successfully employed in Operation Desert Storm. Prototyping efforts have continued to demonstrate size/weight reductions to accommodate carrier-based S-3 aircraft (OUTLAW VIKING) and helicopters (OUTLAW SEAHAWK), and SSN data satellite connectivity. Future efforts will focus on the potential contribution of alternate technology such as direct sequence spread spectrum communications and Direct Broadcast Satellite; promulgate composite OTH-T system specifications; Certify the interoperability of, and exercise configura-tion control over, any system that operates on the Officer-in-Tactical Command Information Exchange System (OTCIXS) net to ensure the integrity of the net for transmission of OTH-T messages as new systems come onto the net, or as existing systems undergo substantive software revisions/upgrades; and, provide technical expertise afloat and ashore via a cadre of highly-trained Fleet Systems Engineers who ensure smooth integration of new capabilities to enhance OTH-T during major Fleet exercises and demonstrations which are used to validate and evaluate developed portions of NBFIA.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: MARCH 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0604707N PROJECT NUMBER: X0798
PROGRAM ELEMENT TITLE: SEW Architecture/Eng Support PROJECT TITLE: OTH Targeting

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS:
   - (U) ($867) Provided Fleet Engineering Support to Fleet Commanders in Chiefs (CINCs) to perform the following: Monitored technical performance of Officer in Tactical Command Information Exchange System (OTCIXS) global satellite network during introduction and demonstration of new capabilities which took place primarily in the 4th quarter of FY 1995. Exercised the OUTLAW VIKING configuration during USS Kitty Hawk's deployment. Provided end-to-end system engineering expertise to ensure smooth integration of new Fleet capabilities during major Fleet exercises and demonstrations.

   - (U) ($866) OTH Targeting Interoperability Certification - Utilized Reconfigurable Land Based Test Site (RLBTS) primarily during the 4th quarter to test major software enhancements of Naval Tactical Command Systems-Afloat, Tomahawk Weapons Control System Block III, and upgrades to the Tactical Data Information Exchange System (TADIXS-A) to verify compliance with interoperability requirements.

2. (U) FY 1996 PLAN:
   - (U) ($914) Provide Fleet Engineering Support to Fleet Commanders in Chiefs (CINCs) to perform the following: Monitor technical performance of OTCIXS during introduction and demonstration of new capabilities. Provide end-to-end system engineering expertise to ensure smooth integration of Naval Tactical Command and Control System (NTCCS) and Ocean Surveillance Information System Baseline Upgrade Evolutionary Development (OBU/OED) systems migration into the Joint Maritime Command Information Strategy (JMCIS, GCCS, and coalition interfaces).

   - (U) ($907) OTH Targeting Interoperability Certification - Utilize RLBTS to test evolutionary software enhancements of NTCCS, OBU/OED migration to JMCIS, to verify compliance with interoperability requirements.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: MARCH 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0604707N PROJECT NUMBER: X0798
PROGRAM ELEMENT TITLE: SEW Architecture/Eng Support PROJECT TITLE: OTH Targeting

(U) PROGRAM ACCOMPLISHMENTS AND PLANS: (Continued)

2. (U) FY 1996 PLAN: (Continued)
   - (U) ($23) Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15 U.S.C.638.

3. (U) FY 1997 PLAN:
   - (U) ($237) Conduct prototyping and demonstrations of OUTLAW HAWKEYE, an initiative to field a Satellite Communications Data Package for the E-2C Aircraft and to integrate the JMCIS/GCCS into aircraft tactical data display systems. Evaluate improved high data rate communications architecture for large and small ships and aircraft.

   - (U) ($615) Provide Fleet Engineering Support to Fleet CINCs to perform the following: Monitor technical performance of OTCIXS during testing of interoperability of Advanced Tomahawk Weapon Control System, advanced submarine combat system (AN-BSY-2), and migration of systems into JMCIS. Provide end-to-end system engineering expertise to ensure smooth integration of these same systems into the Fleet. Efforts have been reduced by $174K as a result of low expenditures in the accounting system for FY 1995.

   - (U) ($592) OTH Targeting Interoperability Certification - Utilize RLBTS to test evolutionary software enhancements, i.e., systems migration into JMCIS, ATWCS and BSY-2, to verify compliance with interoperability requirements. Efforts have been reduced by $157K as a result of low expenditures in the accounting system for FY 1995.

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: MARCH 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0604707N PROJECT NUMBER: X0798
PROGRAM ELEMENT TITLE:SEW Architecture/Eng Support PROJECT TITLE: OTH Targeting

B. (U) PROGRAM CHANGE SUMMARY

	FY 1995	FY 1996	FY 1997
(U) FY 1996/1997 President's Budget	1,733	1,903	1,807
(U) Adjustments from PRESBUDG	0	-59	-363
(U) FY 1997 President's Budget	1,733	1,844	1,444

(U) CHANGE SUMMARY EXPLANATION: FY 1996: Congressional undistributed general and inflation reductions (-$38K); and revised DoD inflation rates and other minor pricing adjustments (-$21K). FY 1997 Revised inflation estimates and other minor pricing adjustments (-$363K).

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

(U) RELATED RDT&E: (SEW) Architecture/Engineering Support program element encompasses all Naval C^4I related efforts.

D. (U) SCHEDULE PROFILE: Not applicable.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: MARCH 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0604707N PROJECT NUMBER: X2144
PROGRAM ELEMENT TITLE: SEW Architecture/Eng Support PROJECT TITLE: SEW Engineering

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1995 ACTUAL	FY 1996 ACTUAL	FY 1997 ESTIMATE	FY 1998 ESTIMATE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
X2144 SEW Engineering	4,208	3,624	3,768	3,904	4,911	4,912	5,025	Cont.	Cont.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: Space and Electronic Warfare (SEW) Engineering is a non-acquisition systems engineering effort and has the objectives of developing, testing and validating a Naval Battle Force Information Architecture (NBFIA) to support naval missions in Joint and Coalition Theater. The mission is carried out by multiple tasks that are used to ensure Naval Command, Control, Communications, Computers and Intelligence (C^4I), Surveillance, and Command and Control Warfare (C^2W) components of SEW are effectively integrated into the NBFIA planning. The Project additionally ensures that (1) the composite operational capabilities of SEW systems (not the individual component systems) conform to the NBFIA as related to the objectives of National Defense Strategy and evolving joint visions and direction, such as "COPERNICUS...Forward", "Forward...From the Sea" and C^4I For the Warrior, the Defense Science Board Summer Study Task Force on Information Architecture for the Battlefield and are guided by CINC requirements; and (2) that SEW systems and systems integration effort involves leading-edge technology transfer of information processing technologies primarily through integration of government and commercial off-the-shelf (COTS/GOTS) products to enhance the Navy's operational capability, interoperability, flexible reconfiguration, as well as reduce costs. SEW Engineering supports the following activities in achieving a fully integrated, interoperable Naval C^4I system: identify technology developments that can be brought to bear to meet and validate NBFIA operational objectives, address prioritized CINC issues; integrate Naval C^4I system developments, including developments from other services and commercially developed products in support of Joint Warfare Interoperability Demonstrations (JWID); develop interface and connectivity architectures to support the enhanced operational capabilities in support of the NBFIA; using the Engineering Process Model develop, document, test, demonstrate, implement and analyze the NBFIA; extract lessons learned for feedback to research, development, and acquisition programs to support further NBFIA

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: MARCH 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0604707N PROJECT NUMBER: X2144
PROGRAM ELEMENT TITLE: SEW Architecture/Eng Support PROJECT TITLE: SEW Engineering

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: (Continued)
development efforts or more extensive implementation. Perform high-level systems architecture/engineering to support long-range planning for "COPERNICUS...Forward", C4I For the Warrior, Theater Battle Management (in conjunction with the Air Force), Digitization of the Battlefield (in conjunction with the Army), Theater Ballistic Missile Defense, Mine Warfare, Amphibious Warfare and integration into NBFIA, Defense Information Infrastructure (DII) and coalition force architectures.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1995 ACCOMPLISHMENTS:
   - (U) ($2,247) Developed plans and Naval C4I Architectures for the integration of C4I system developments in operational exercises to demonstrate enhanced C4I capabilities. The Naval C4I Architecture is a hierarchical concept that is supported by specific mission area or warfare battlegroup upgrade architectures that specifically supported the demonstration of enhanced capabilities such as increased speed and quality of imagery transmission, increased data transfer capability, use of video teleconferencing, expanded secure telephone service afloat, and improvements in the NTCS-A common tactical/operational picture. Exercises/demonstrations were additionally used for specific Naval C4I architecture evaluation/validation: (1) Tandem Thrust 95 was the first implementation of a new antenna and Joint Forces Air Component Commander (JFACC) capability and associated architecture changes onboard a CV; (2) Unified Endeavor 95 exercised and evaluated the use of Joint service components such as AWACS, Electronic Order of Battle, Rules of Engagement in Land Warfare, and Joint Intelligence Tactical and National Wargaming simulations; (3) African Eagle 95 was utilized to work with Army Component Commanders' coordination and integration of the Army Theater Missile Defense Cell (TMD) and Naval OTCIXS broadcast; (4) Naval C4I architecture connectivity issues were evaluated with enhanced C3 interoperable circuits for common picture in South American Navy improvement (SOAM; (5) Kernel Blitz 95 was the extension of C4I enhancements to Mine Warfare (MIW); while

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: MARCH 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0604707N PROJECT NUMBER: X2144
PROGRAM ELEMENT TITLE: SEW Architecture/Eng Support PROJECT TITLE: SEW Engineering

(U) PROGRAM ACCOMPLISHMENTS AND PLANS: (Continued)

1. (U) FY 1995 ACCOMPLISHMENTS: (Continued)

(6) The Joint Warrior Interoperability Demonstration (JWID) demonstrated new Naval C4I Architectural concepts through the use of enhanced submarine connectivity via SHF and the first demonstration of a Common Operational Picture available to all Joint Service Commanders that automatically included ground tracks.

- (U) ($1,099) Naval C4I Architectures are developed to support planning, demonstrations and validation of new technology insertions into the active Fleet assets overall combat system capabilities and the operational objectives of above exercises. Extracted lessons learned for feedback to research, development, and acquisition programs to support further development efforts. Many new conceptional and technical changes/improvements to Naval C4I Architecture were demonstrated in exercises/installations that began in FY 94 and evaluation was completed in FY 95 (Agile Provider 94, RIMPAC 94, USS LASALLE C4I suite installment, JWID 94).

- (U) ($862) Utilized the Reconfigurable Land Based Test Site (RLBTS) to verify and validate Naval C4I Architectural enhancements and interoperabilities prior to use in exercises/demonstrations.

2. (U) FY 1996 PLAN:

- (U) ($966) Develop plans for the integration, in annual Joint Warrior Interoperability Demonstration (JWID), of maturing system developments, and military and commercial technologies that support NBFIA through the use of enhanced operational capabilities in key CINC priority areas and Joint Mission Area (JMA) Assessment thrust areas such as high capacity communications, improved Command and Control Warfare (C2W), integrated landfight architecture, trusted systems/multi-level security, improved sensors/strike planning, common tactical/operational picture, theater air defense/force protection, and combat identification.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: MARCH 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0604707N PROJECT NUMBER: X2144
PROGRAM ELEMENT TITLE: SEW Architecture/Eng Support PROJECT TITLE: SEW Engineering

(U) PROGRAM ACCOMPLISHMENTS AND PLANS: (Continued)

2. (U) FY 1996 PLAN: (Continued)

- (U) ($1,835) Develop, test and validate a Naval Battle Force Information Architecture (NBFIA) based on a multi-tier architecture, Operational, System and Technical, to support Naval missions in a Joint and Coalition Theater. NBFIA development will consist of (1) assisting OPNAV, Navy Doctrine Command, and Fleet Commanders in the development of Operation Architectures and maintain documentation describing these Operational Architectures; (2) defining System Architecture parameters, attributes, and characteristics necessary to ensure that Program Executives and Managers acquire systems that achieve the desired operational objectives; and (3) defining the appropriate Technical Architectural standards and interfaces to achieve fully interoperable systems. Initial template for NBFIA will be the development the Mine Information Warfare and Theater Ballistic Missile Defense Architectures.

- (U) ($771) Develop high-level systems architecture/engineering to support long range planning for "COPERNICUS...Forward", C^4I for the Warrior, Joint Air Operations Functional Process Improvement, Theater Battle Management (in conjunction with the Air Force), Digitization of the Battlefield (with the Army), Theater Ballistic Missile Defense, Mine Warfare, Amphibious Warfare and integration into the DII. Utilize the Reconfigurable Land Based Test Site (RLBTS) to verify and validate the interfaces ensuring interoperability and compatibility and portions of NBFIA. Extract lessons learned for feedback to research, development, and acquisition programs to support further development efforts and fill known gaps in NBFIA. Specific enhancements include: C^4 to support Joint Forces Air Component Commander (JFACC) on the aircraft carrier; CJTF command transition ship-to-shore; high capacity line-of-sight communication to support Marine landing forces and command elements transitioning ashore; integration of mine warfare data into shared common tactical/operational picture; and improvements in the interfacing of distributed modeling and simulation with C^2 decision support systems.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS: (Continued)

2. (U) FY 1996 PLAN: (Continued)

- (U) ($52) Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15 U.S.C.638.

3. (U) FY 1997 PLAN:

- (U) ($1,000) Develop plans for the integration, in annual Joint Warrior Interoperability Demonstration (JWID) with Navy as the lead service to coordinate all participation, of maturing system developments, and military and commercial technologies that support enhanced operational capability in key CINC priority areas and Joint Mission Area (JMA) Assessment thrust areas such as high capacity communications, improved Command and Control Warfare (C^2W), integrated landfight architecture, trusted systems/multi-level security, improved sensors/strike planning, common operational picture, collaborative planning, knowledge based systems, smart push-warrior pull data flow, theater air defense/force protection, and combat identification.

- (U) ($1,350) Continue to develop, test and validate a Naval Battle Force Information Architecture (NBFIA) based on a multi-tier architecture,Operational, System and Technical, to support Naval missions in a Joint and Coalition Theater. NBFIA development will consist of (1) assisting OPNAV, Navy Doctrine Command, and Fleet Commanders in the development of Operation Architectures and maintain documentation describing these Operational Architectures; (2) defining System Architecture parameters, attributes, and characteristics necessary to ensure that Program Executives and Managers acquire systems that achieve the desired operational objectives; and (3) defining the appropriate Technical Architectural standards and interfaces to achieve fully interoperable systems. Follow-on template(s) for NBFIA will evolve based on FY96 completed tasking.

FY 1997 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: MARCH 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0604707N PROJECT NUMBER: X2144
PROGRAM ELEMENT TITLE: SEW Architecture/Eng Support PROJECT TITLE: SEW Engineering

(U) PROGRAM ACCOMPLISHMENTS AND PLANS: (Continued)

3. (U) FY 1997 PLAN: (Continued)

- (U) ($1,418) Develop high-level systems architecture/engineering to support long range planning for "COPERNICUS...Forward", C4I for the Warrior, Joint Air Operations Functional Process Improvement, Theater Battle Management (in conjunction with the Air Force), Digitization of the Battlefield (with the Army), Theater Ballistic Missile Defense, Mine Warfare, and Amphibious Warfare, common operational picture, common operating environment, synchronous execution and integration into the DII. Utilize the Reconfigurable Land Based Test Site (RLBTS) to verify and validate the interfaces ensuring interoperability. Extract lessons learned for feedback to research, development, and acquisition programs to support further development efforts.

FY 1997 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: MARCH 1996

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0604707N PROJECT NUMBER: X2144
PROGRAM ELEMENT TITLE: SEW Architecture/Eng Support PROJECT TITLE: SEW ENGINEERING

B. (U) PROGRAM CHANGE SUMMARY:

	FY 1995	FY 1996	FY 1997
(U) FY 1996/1997 President's Budget:	3,213	3,839	3,859
(U) Adjustments from PRESBUDG:	+995	-215	-91
(U) FY 1997 President's Budget:	4,208	3,624	3,768

(U) CHANGE SUMMARY EXPLANATION: FY 95 Navy increase of $1M for C4I upgrades in support of Exercise Kernel Blitz and for Joint Warrior Interoperability Demonstration, decrease of $5K reprogrammed to cover Fact of Life adjustments in other Navy programs. FY 1996: Congressional undistributed general and inflation reductions (-$172K); and revised DoD inflation rates and other minor pricing adjustments (-$43K). FY 1997 Revised inflation estimates and other minor pricing adjustments (-$91K).

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

(U) RELATED RDT&E: (SEW) Architecture/Engineering Support program element relates to all Naval C4I related efforts.

D. (U) SCHEDULE PROFILE: Not applicable.