

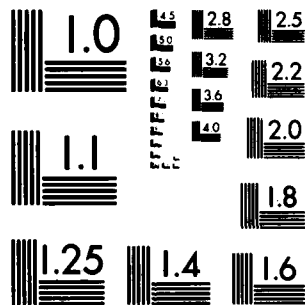
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DEPARTMENT OF THE NAVY JUSTIFICATION OF ESTIMATES FOR FISCAL YE--ETC (11)
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DEPARTMENT OF THE NAVY JUSTIFICATION OF ESTIMATES FOR FISCAL YEAR 1983



SUBMITTED TO CONGRESS FEBRUARY 1982

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RESEARCH, DEVELOPMENT, TEST AND EVALUATION:
RESEARCH, DEVELOPMENT, TEST AND EVALUATION,NAVY

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) THIS BOOK CONTAINS RESEARCH, DEVELOPMENT, TEST AND EVALUATION, NAVY APPROPRIATION LANGUAGE PROGRAM AND FINANCING EXHIBITS, THE R-1 EXHIBIT, NARRATIVE AND OTHER JUSTIFICATION MATERIAL		

DEPARTMENT OF DEFENSE, MILITARY
RDT&E, NAVY
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RESEARCH, DEVELOPMENT, TEST AND EVALUATION, NAVY

For expenses necessary for basic and applied scientific research, development, test and evaluation, including maintenance, rehabilitation, lease, and operation of facilities and equipment, as authorized by law; \$6,232,300,000 to remain available for obligation until 30 September 1984. (10 U.S.C. 174, 2352-4, 5150-3, 7201, 7203, 7522; 31 U.S.C. 718; Department of Defense Appropriation Act, 1982; additional authorizing legislation to be proposed).

Navy

Research, Development, Test, and Evaluation, Navy

08 FEB 82

Program and Financing (in thousands of dollars)

Identification code	17-1319-0-1-051	Budget plan (amounts for RDT&E actions programmed)			Obligations		
		1981 actual	1982 est.	1983 est.	1981 actual	1982 est.	1983 est.
Program by activities:							
Direct:							
1.	Technology base	702,748	769,803	853,427	698,038	770,607	851,336
2.	Advanced technology development	149,898	152,186	165,122	154,441	154,180	164,216
3.	Strategic programs	404,779	526,529	668,939	373,123	546,974	658,970
4.	Tactical programs	3,107,230	3,546,340	3,678,085	3,095,623	3,490,760	3,644,696
5.	Intelligence and communications	152,868	215,274	247,806	150,221	216,997	244,506
6.	Defensewide mission support	507,345	596,999	618,921	498,966	580,057	643,066
Total direct		5,024,866	5,807,131	6,232,300	4,970,412	5,759,575	6,206,790
Reimbursable program		136,344	160,000	160,000	146,605	156,674	160,000
10.0001	Total	5,161,210	5,967,131	6,392,300	5,117,017	5,916,249	6,366,790
Financing:							
Offsetting collections from:							
11.0001	Federal funds	-135,680	-157,400	-157,400	-145,840	-157,400	-157,400
13.0001	Trust funds	-382	-600	-600	-397	-600	-600
14.0001	Non-federal sources	-302	-2,000	-2,000	-125	-2,000	-2,000
17.0001	Recoveries of prior year obligations(-)				-4,980		
Unobligated balance available, start of year:							
21.4001	For completion of prior year budget plans				-270,264	-279,249	-358,028
21.4002	Available to finance new budget plans			-37,226			-37,226
21.4003	Reprogramming from or to prior year budget plan	-50,187	27,897				
22.4001	Unobligated balance transferred from other accounts(-)		-27,897			-27,897	
23.4001	Unobligated balance transferred to other accounts	6,900			6,900		
Unobligated balance available, end of year:							
24.4001	For completion of prior year budget plans				279,249	358,028	383,538
24.4002	Available to finance subsequent year budget plans		37,226	37,226		37,226	37,226
25.0001	Unobligated balance lapsing	15,390			15,390		
29.0001	Budget authority	4,996,969	5,844,357	6,232,300	4,996,969	5,844,357	6,232,300
Budget authority:							
40.0001	Appropriation	4,974,769	5,844,357	6,232,300	4,974,769	5,844,357	6,232,300
42.0001	Transferred from other accounts	13,400			13,400		
43.0001	Appropriation (adjusted)	4,988,189	5,844,357	6,232,300	4,988,189	5,844,357	6,232,300
40.0001	Reappropriation	8,800			8,800		
Relation of obligations to outlays:							
71.0001	Obligations incurred, net				4,970,655	5,756,249	6,206,790
72.4001	Obligated balance, start of year				2,416,565	2,604,648	2,949,297
74.4001	Obligated balance, end of year				-2,604,648	-2,949,297	-3,206,987
77.0001	Adjustments in expired accounts				5,299		
78.0001	Adjustments in unexpired accounts				-4,960		

90.0001 Outlays

4,782,911 5,411,600 5,947,100

Navy

Research, Development, Test, and Evaluation, Navy

08 FEB 82

Program and Financing (in thousands of dollars)

1980 Fiscal year program

Identification code	17-1319-0-1-051	Budget plan (amounts for RDT&E actions programed)			Obligations		
		1981 actual	1982 est.	1983 est.	1981 actual	1982 est.	1983 est.
Program by activities:							
Direct:							
	1. Technology base				15,341		
	2. Advanced technology development				17,190		
	3. Strategic programs				25,646		
	4. Tactical programs				159,799		
	5. Intelligence and communications				14,145		
	6. Defensewide mission support				14,297		
	Total direct				246,418		
	Reimbursable program				16,535		
10.0001	Total				262,953		
Financing:							
Offsetting collections from:							
11.0001	Adjustment to prior year federal fund orde				-10,180		
13.0001	Adjustment to prior year trust fund orders				-15		
14.0001	Adjustment to non-federal sources				177		
17.0001	Recoveries of prior year obligations(-)				-4,960		
Unobligated balance available, start of year:							
21.4001	For completion of prior year budget plans				-270,264		
21.4002	Reprogramming from or to prior year budget plan	-22,290					
23.4001	Unobligated balance transferred to other accounts	6,900			6,900		
25.0001	Unobligated balance lapsing	15,390			15,390		
40.0001	Budget authority						

Navy Research, Development, Test, and Evaluation, Navy

Program and Financing (in thousands of dollars)

08 FEB 82

1981 Fiscal year program

Identification code	17-1319-0-1-051	Budget plan (amounts for RDT&E actions programmed)			Obligations		
		1981 actual	1982 est.	1983 est.	1981 actual	1982 est.	1983 est.

Program by activities:							
Direct:							
	1. Technology base	702,746	.....	.....	682,697	20,049	.....
	2. Advanced technology development	149,898	.....	.....	137,251	12,647	.....
	3. Strategic programs	404,779	.....	.....	347,477	57,302	.....
	4. Tactical programs	3,107,230	.....	.....	2,935,824	171,406	.....
	5. Intelligence and communications	152,868	.....	.....	136,076	16,792	.....
	6. Defensewide mission support	507,345	.....	.....	484,669	22,676	.....
		-----	-----	-----	-----	-----	-----
	Total direct	5,024,866	.....	.....	4,723,994	300,872	.....
	Reimbursable program	136,344	.....	.....	130,070	6,274	.....
		-----	-----	-----	-----	-----	-----
10.0001	Total	5,161,210	.....	.....	4,854,064	307,146	.....

Financing:							
Offsetting collections from:							
11.0001	Federal funds	-135,660	.....	.....	-135,660	.....	.....
13.0001	Trust funds	-382	.....	.....	-382	.....	.....
14.0001	Non-federal sources	-302	.....	.....	-302	.....	.....
	Unobligated balance available, start of year:	.....	.....	.....	.....	.....	.....
21.4001	For completion of prior year budget plans	.....	.....	.....	.....	-279,249	.....
21.4002	Reprogramming from or to prior year budget plan	-27,897	27,897	.....	.....	.....	.....
22.4001	Unobligated balance transferred from other accounts(-)	.....	-27,897	.....	.....	-27,897	.....
24.4001	Unobligated balance available, end of year	.....	.....	.....	279,249	.....	.....
		-----	-----	-----	-----	-----	-----
39.0001	Budget authority	4,996,969	.....	.....	4,996,969	.....	.....

Budget authority:							
40.0001	Appropriation	4,974,769	.....	.....	4,974,769	.....	.....
42.0001	Transferred from other accounts	13,400	.....	.....	13,400	.....	.....
		-----	-----	-----	-----	-----	-----
43.0001	Appropriation (adjusted)	4,988,169	.....	.....	4,988,169	.....	.....
50.0001	Reappropriation	8,800	.....	.....	8,800	.....	.....

Navy

Research, Development, Test, and Evaluation, Navy

08 FEB 82

Program and Financing (in thousands of dollars)

1982 Fiscal year program

Identification code	17-1319-0-1-051	Budget plan (amounts for RDT&E actions programed)			Obligations		
		1981 actual	1982 est.	1983 est.	1981 actual	1982 est.	1983 est.
Program by activities:							
Direct:							
	1. Technology base		769,803		750,558	19,245	
	2. Advanced technology development		152,186		141,533	10,653	
	3. Strategic programs		526,529		489,672	36,857	
	4. Tactical programs		3,546,340		3,319,354	226,986	
	5. Intelligence and communications		215,274		200,205	15,069	
	6. Defensewide mission support		596,999		557,381	39,618	
	Total direct		5,807,131		5,458,703	348,428	
	Reimbursable program		160,000		150,400	9,600	
10.0001	Total		5,967,131		5,609,103	358,028	
Financing:							
Offsetting collections from:							
11.0001	Federal funds		-157,400		-157,400		
13.0001	Trust funds		-600		-600		
14.0001	Non-federal sources		-2,000		-2,000		
	Unobligated balance available, start of year:						
21.4001	For completion of prior year budget plans					-358,028	
21.4002	Available to finance new budget plans			-37,226		-37,226	
	Unobligated balance available, end of year:						
24.4001	For completion of prior year budget plans				358,028		
24.4002	Available to finance subsequent year budget plans		37,226	37,226	37,226	37,226	
40.0001	Budget authority		5,844,357		5,844,357		

Navy

Research, Development, Test, and Evaluation, Navy

08 FEB 82

Program and Financing (in thousands of dollars)

1983 Fiscal year program

Identification code	17-1319-0-1-051	Budget plan (amounts for RDT&E actions programmed)			Obligations			
		1981 actual	1982 est.	1983 est.	1981 actual	1982 est.	1983 est.	
Program by activities:								
Direct:								
1.	Technology base			853,427			832,091	
2.	Advanced technology development			165,122			153,563	
3.	Strategic programs			668,939			622,113	
4.	Tactical programs			3,678,085			3,417,710	
5.	Intelligence and communications			247,806			229,437	
6.	Defensewide mission support			618,921			603,448	
	Total direct			6,232,300			5,858,362	
	Reimbursable program			160,000			150,400	
10.0001	Total			6,392,300			6,008,762	
Financing:								
Offsetting collections from:								
11.0001	Federal funds			-157,400			-157,400	
13.0001	Trust funds			-600			-600	
14.0001	Non-federal sources			-2,000			-2,000	
24.4001	Unobligated balance available, end of year						383,538	
40.0001	Budget authority			6,232,300			6,232,300	

Navy

Research, Development, Test, and Evaluation, Navy
(Supplemental now requested under existing legislation)

08 FEB 82

Program and Financing (in thousands of dollars)

Identification code	17-1319-1-1-051	Budget plan (amounts for RDT&E actions programmed)			Obligations		
		1981 actual	1982 est.	1983 est.	1981 actual	1982 est.	1983 est.
Financing:							
	Unobligated balance available, start of year:						
21.4001	Available to finance new budget plans			37,226			37,226
24.4001	Unobligated balance available, end of year		-37,226	-37,226		-37,226	-37,226
40.0001	Budget authority (appropriation)		-37,226			-37,226	

Navy

Research, Development, Test, and Evaluation, Navy

08 FEB 82

Object Classification (in thousands of dollars)

Identification code	17-1319-0-1-051	1981 actual	1982 est.	1983 est.
Direct obligations:				
Personnel compensation:				
111.101	Full-time permanent	43,390	51,088	52,851
111.301	Other than full-time permanent	6,129	518	534
111.501	Other personnel compensation	526	642	663
111.901	Total personnel compensation	50,045	52,248	54,048
112.101	Civilian personnel	4,841	5,363	5,534
113.001	Benefits for former personnel	61		
121.001	Travel and transportation of persons	13,576	16,600	18,700
122.001	Transportation of things	2,807	3,380	3,700
123.201	Communications, utilities and other rent	7,483	10,648	8,400
124.001	Printing and reproduction	1,064	1,140	1,220
Other services:				
125.001	Payments to foreign national indirect hire personnel	44		
125.002	Purchases from industrial funds	1,219,131	1,408,000	1,460,000
125.003	Contracts	3,037,804	3,637,286	3,973,628
125.004	Other	579,633	568,590	623,180
126.001	Supplies and materials	14,758	15,300	15,800
131.001	Equipment	35,120	36,800	38,200
132.001	Leads and structures	1,351	1,420	1,480
141.001	Grants, subsidies, and contributions	2,694	2,800	2,900
199.001	Total direct obligations	4,970,412	5,759,575	6,206,790
Reimbursable obligations:				
Personnel compensation:				
211.101	Full-time permanent	7,341	10,738	11,069
211.301	Other than full-time permanent	1,037	106	112
211.501	Other personnel compensation	89	132	136
211.901	Total personnel compensation	8,467	10,976	11,317
212.101	Civilian personnel	788	1,098	1,133
221.001	Travel and transportation of persons	1,024	2,380	2,620
222.001	Transportation of things	315	260	270
223.201	Communications, utilities and other rent	686	710	730
224.001	Printing and reproduction	156	160	165
Other services:				
225.003	Contracts	99,814	105,210	107,255
225.004	Other	31,569	32,000	32,500
226.001	Supplies and materials	3,151	3,200	3,300
231.001	Equipment	635	680	710
299.001	Total reimbursable obligations	146,605	156,674	160,000
999.901	Total obligations	5,117,017	5,916,249	6,366,790

Department of Defense, Military

RDT&E, Navy

Personnel Summary

	<u>FY 1981 Actual</u>	<u>FY 1982 Estimate</u>	<u>FY 1983 Estimate</u>
er of Permanent Positions	2117	2490	2484
ensible Work Years	2425	2505	2540
Equivalent of Other Positions	320	26	26
Equivalent of Overtime and Holiday Hours	17	22	22
Salary	50057	56015	57983
Grade	9.56	9.61	9.61
(GM) Salary	26175	27084	27673
Salary of Ungraded Positions	16981	19147	19324

DEPARTMENT OF DEFENSE, MILITARY
RD&E, NAVY
PROGRAM ELEMENT LISTING
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PROGRAM ELEMENT LISTING
INTRODUCTION AND EXPLANATION OF CONTENTS

1. General. This section has been prepared to provide specific data at the Research and Development program element level in support of the budget request for Research, Development, Test and Evaluation, Navy. The program element listing is preceded by summaries for research category, budget activity and FYDP program.
2. Relationship to "Supporting Data for FY 1983 Budget Estimates--Descriptive Summaries." A separate document "Supporting Data for FY 1983 Budget Estimates--Descriptive Summaries" provides narrative information on all program elements for which funds are requested and on projects of \$5.0 million or more. The initial page of each descriptive summary for each program element contains a project listing section which breaks down the program element values contained in this program element listing to the research and development project level. The index number in the right hand column of this element listing refers to the appropriate page in the Descriptive Summaries. The funding information reflected in the element listing and in the Descriptive Summaries corresponds to that contained in the President's Budget.
3. Classification. Classified information is identified by use of brackets [].
4. Relationship of FY 1983 Budget Structure to the FY 1982 Budget Structure Approved by Congress. The project and program element structure contained in the Navy's FY 1983 budget request is consistent with the guidance provided by the Congress in its action on the FY 1982 DoD Budget Submission to Congress. The FY 1983 and FY 1984 programs do reflect a number of evolutionary changes resulting from the initiation of new programs and the separation from existing program elements of research and development projects requiring their own program element in the interest of control and visibility. The following list explains the origin of all program elements which do not appear on the Base for Reprogramming Action (DD 1414) for Research, Development, Test and Evaluation, Navy, which was prepared pursuant to final Congressional Action on the FY 1982 DoD Budget Submission to Congress. Data for FY 1981 and FY 1982 has not been adjusted to achieve comparability with the revised structure for FY 1983, except in Program Elements 31303N, 31309N, 31325N, 31326N, 31327N, 31355N, and 65873N.

PROGRAM ELEMENT LISTING
INTRODUCTION AND EXPLANATION OF CONTENTS

PROGRAM ELEMENT

REMARKS

BUDGET ACTIVITY 2: ADVANCED TECHNOLOGY DEVELOPMENT

63710N Man-Machine Technology	New program element for effort previously included in Program Elements 63707N, 63720N and 63727N.
-------------------------------	---

BUDGET ACTIVITY 4: TACTICAL PROGRAMS

63209N Underwater Weapons Acceptance Testing	New program proposed for FY 1984.
63382N Battle Group Anti-Air Warfare Coordination	New program element for Project S0324, Battle Group Anti-Air Warfare Coordination, previously included in Program Element 64303N.
63506N Surface Ship Torpedo Defense	Existing program element for effort last funded in FY 1979.
63576N CHALK EAGLE	New program proposed for FY 1983.
63590N Wide Aperture Array (Advanced)	New program element for Project S0222, Wide Aperture Array (Advanced), previously included in Program Element 63504N.
63691N MK 48 Advanced Capability (Advanced)	New program element for Project S0311, MK 48 Advanced Capability (Advanced), previously included in Program Element 63562N.
63726N Merchant Ship Naval Augmentation Program	New program element for Project S0378, Merchant Ship Naval Augmentation Program, previously included in Program Element 63705N.
63737N LINK HAZEL	New program proposed for FY 1983.
64227N HARPOON Modifications	New program proposed for FY 1983.
64228N SH-60 Carrier Variant	New program proposed for FY 1983.

PROGRAM ELEMENT

REMARKS

64307N CG-47/AEGIS Product Improvement

New program element for Projects S1275, SPY-1 Radar Improvements, and S1447, CG-47/AEGIS Product Improvements, previously included in Program Element 64303N.

64371N HELLFIRE

New program element for Project W1415, HELLFIRE, transitioning from Advanced Development (Program Element 63313N) in FY 1983.

64372N New Threat Upgrade

New program element for Projects S0188, New Threat Upgrade, and S0964, TARTAR SM-2/New Threat Upgrade, previously included in Program Element 64352N.

64507N Enhanced Modular Signal Processor

New program element for efforts transitioning from Advanced Development (Program Element 63524N) in FY 1983.

64516N Ship Survivability

New program element for efforts transitioning from Advanced Development (Program Element 63514N).

64575N AN/SQS-53C

New program element for Project S1451, AN/SQS-53C, transitioning from Advanced Development (Program Element 63589N) in FY 1983.

64576N Influence Mine Countermeasures

New program element for efforts transitioning from Advanced Development (Program Element 63502N) in FY 1983.

64619N Advanced Lightweight Torpedo (Engineering)

New program element for Project S0199, Advanced Lightweight Torpedo, transitioning from Advanced Development (Program Element 63610N) in FY 1983.

64656M Marine Corps Assault Vehicles

New program element for Project C1293, Stratified Charge Rotary Engine, transitioning from Advanced Development (Program Element 63611M) in FY 1983.

64675N MK 48 Advanced Capability (Engineering)

New program element for Project S0366, MK 48 Advanced Capability (Advanced), previously included in Program Element 64562N.

PROGRAM ELEMENT

REMARKS

64720M Tactical Air Operations Central - 1985	New program element for Project C0038, Tactical Air Operations Central - 1985, previously included in Program Element 64719M.
64789N Surveillance Towed Array Sensor	Existing program element for effort last funded in FY 1981.
24136N F/A-18 Squadrons	New program element for effort transitioning from Engineering Development (Program Element 64263N) in FY 1984.
24571N Special Projects	New program element for Projects W0431, Tactical Aircrew Combat Training System, and W1414, Integrated Air Warfare Training Complex-Fallon, previously included in Program Element 24161N.
24576N Counter Command, Control and Communications Development	New program element for Project X1370, Command, Control and Communications Countermeasures Development, previously included in Program Element 24575N.
26625M Intelligence/Electronic Warfare Systems	Existing program element for effort last funded in FY 1981.
28009N Cruise Missile	New program element for effort transitioning from Engineering Development (Program Element 64367N) in FY 1983.

BUDGET ACTIVITY 5: INTELLIGENCE AND COMMUNICATIONS

63511N Air Control	New program proposed for FY 1984.
64577N Extremely High Frequency Satellite Communications	New program element for efforts previously funded in Program Elements 33109N and 11403N.
31335N ADP General Defense Intelligence Program Support	New program proposed for FY 1984.

PROGRAM ELEMENT

REMARKS

BUDGET ACTIVITY 6: DEFENSEWIDE MISSION SUPPORT

65873N Long Range Planning Support

New program element for effort previously included in Program Element 65861N.

DEPARTMENT OF THE NAVY
FY 1983 R D T & E PROGRAM

EXHIBIT R-1

SUMMARY

DATE: 08 FEB 1982

THOUSANDS OF DOLLARS

	FY 1981	FY 1982	FY 1983	FY 1984
SUMMARY RECAP OF RESEARCH CATEGORIES				
RESEARCH	241,418	276,221	313,388	345,050
EXPLORATORY DEVELOPMENT	461,328	493,582	540,039	591,117
ADVANCED DEVELOPMENT	1,265,393	1,616,459	1,865,475	3,100,327
ENGINEERING DEVELOPMENT	1,887,327	2,061,883	2,012,311	1,920,313
MANAGEMENT AND SUPPORT	482,276	558,300	602,307	656,302
RESEARCH AND DEVELOPMENT (FYDP PROGRAM 8)	4,337,742	5,006,445	5,333,520	6,613,109
OPERATIONAL SYSTEMS DEVELOPMENT	687,124	800,686	898,780	1,133,402
TOTAL RESEARCH DEVELOPMENT TEST + EVAL, NAVY	5,024,866	5,807,131	6,232,300	7,746,511
SUMMARY RECAP OF BUDGET ACTIVITIES				
TECHNOLOGY BASE	702,746	769,803	853,427	936,167
ADVANCED TECHNOLOGY DEVELOPMENT	149,898	152,186	165,122	242,849
STRATEGIC PROGRAMS	404,779	526,529	668,939	1,829,577
TACTICAL PROGRAMS	3,107,230	3,546,340	3,678,085	3,671,319
INTELLIGENCE AND COMMUNICATIONS	152,868	215,274	247,806	400,138
DEFENSEWIDE MISSION SUPPORT	507,345	596,999	618,921	666,461
TOTAL RESEARCH DEVELOPMENT TEST + EVAL, NAVY	5,024,866	5,807,131	6,232,300	7,746,511
SUMMARY RECAP OF FYDP PROGRAMS				
STRATEGIC FORCES	282,603	265,542	279,845	394,785
GENERAL PURPOSE FORCES	280,549	363,066	453,701	508,712
INTELLIGENCE AND COMMUNICATIONS	123,357	171,078	164,077	228,527
RESEARCH AND DEVELOPMENT (FYDP PROGRAM 8)	4,337,742	5,006,445	5,333,520	6,613,109
TRAINING MEDICAL AND OTHER	615	1,000	1,157	1,378
TOTAL RESEARCH DEVELOPMENT TEST + EVAL, NAVY	5,024,866	5,807,131	6,232,300	7,746,511

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				FY 1981	FY 1982	FY 1983	FY 1984		
1	61152H	IN-HOUSE LAB INDEPENDENT RESEARCH	1	20,396	21,516	23,337	26,190	U	1
2	61153N	DEFENSE RESEARCH SCIENCES	1	221,022	254,705	290,051	318,860	U	5
3	62241N	AIRCRAFT TECHNOLOGY	1	28,657	24,297	27,414	31,865	U	69
4	62331N	MISSILE PROPULSION TECHNOLOGY	1	9,349	9,247	9,616	9,864	U	80
5	62332N	STRIKE WARFARE WEAPONRY TECHNOLOGY	1	31,130	20,400	29,808	31,481	U	90
6	62542N	NUCLEAR PROPULSION TECHNOLOGY	1	44,639	47,576	53,624	58,735	U	124
7	62543N	CHIPS/SUBS/BOATS TECH	1	35,016	38,251	44,156	48,501	U	145
8	62633N	UNDERSEA WARFARE WEAPONRY TECHNOLOGY	1	21,526	25,022	25,064	31,079	U	174
9	62711N	UNDERSEA TARGET SURVEILLANCE TECH	1	36,808	35,810	37,968	42,560	U	196
10	62712N	AIR/SPACE TARGET SURVEIL TECH	1	29,575	33,634	35,016	36,593	U	227
11	62721N	COMMAND/CONTROL TECHNOLOGY	1	35,381	29,161	30,577	35,609	U	247
12	62734N	COUNTERMEASURES TECHNOLOGY	1	25,036	27,931	29,144	31,507	U	257
13	62735N	HIGH ENERGY LASER TECH	1	38,276	57,487	63,210	69,440	U	280
14	62737N	HUMAN FACTORS/SIMULATION TECH	1	5,863	6,487	8,055	8,447	U	285
15	62758N	BIOLOGICAL TECHNOLOGY	1	10,081	10,619	8,996	9,589	U	292
16	62759N	OCEAN/ATMOSPHERIC SUPPORT TECHNOLOGY	1	22,545	21,585	20,557	21,827	U	300
17	62760N	LOGISTICS TECHNOLOGY	1	11,808	13,340	14,177	15,724	U	312
18	62761N	MATERIALS TECHNOLOGY	1	29,777	33,121	33,019	35,675	U	326
19	62762N	ELECTRONIC DEVICE TECHNOLOGY	1	24,010	26,076	27,134	29,341	U	350
20	62763N	PERSONNEL & TRNG TECH	1	5,734	6,377	7,259	7,738	U	374
21	62761N	CHEM BIOLOGICAL/RADIOLOGICAL DEFENSE TECH	1	730	1,754	1,789	2,545	U	380

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				FY 1981	FY 1982	FY 1983	FY 1984		
22	62765N	ENERGY AND ENVIRONMENTAL PROTECTION	1	6,550	7,443	6,451	6,728 U		386
23	62766N	LAB INDEPENDENT EXPLORATORY DEV	1	8,859	11,967	12,091	12,310 U		391
24	62768N	DIRECTED ENERGY TECHNOLOGY	1		5,997	14,916	13,761 U		396
		TECHNOLOGY BASE		702,746	769,803	853,427	936,167		
25	63202N	AVIONICS	2	3,314	3,745	3,822	10,342 U		407
26	63203N	ADV HELICOPTER DEV	2	4,577	4,790		U		
27	63207N	ENVIRONMENTAL APPLICATIONS	2	4,854	4,684	7,094	9,616 U		412
28	63210N	ADV A/C PROPUL SYS	2	14,504	8,990	10,113	10,182 U		417
29	63216N	AIRBORNE LIFE SUPPORT SYSTEMS	2	4,521	3,140	3,483	2,752 U		425
30	63217N	ADVANCED AIRCRAFT SUBSYSTEMS	2		4,500	4,928	11,457 U		430
31	63251N	AIRCRAFT SYSTEMS	2	5,930	3,744	3,430	6,671 U		435
32	63303N	ERASE SYS TECHNOLOGY	2	4,277	5,963	5,849	6,635 U		439
33	63306N	ADV A/L ASM SYSTEMS	2	5,389	3,838	4,011	4,283 U		444
34	63308N	A/A MSL ADV TECH DEMOS	2	2,871	4,262	2,923	3,233 U		448
35	63508N	SHIP PROPULSION SYSTEM	2	15,798	18,184	20,457	34,471 U		452
36	63526N	ADV COMPUTER TECH	2	5,514	4,534	3,272	4,085 U		466
37	63573N	ELECTRIC DRIVE	2			9,787	20,754 U		471
38	63574N	JOINT ORDNANCE DEV	2				U		
39	63609N	SURFACE LAUNCHED MUNITIONS	2	3,927	4,220	4,331	4,349 U		479
40	63654N	JT SERV EXPLOSIVE ORD DEV	2	3,063	3,330	4,957	5,114 U		483
41	63701N	HUMAN FACTORS ENG DEV	2	2,875	3,050	2,604	3,567 U		487

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42 63704N	OCEANOGRAPHIC INSTRUMENTATION DEV	2	2,456	2,902	2,999	6,300	U	492
43 63706N	MEDICAL DEVELOPMENT	2	9,428	12,234	8,858	9,890	U	497
44 63707N	MINER CONTROL SYS DEV	2	3,129	2,773	3,511	2,793	U	508
45 63708N	ADVANCED MARINE BIOLOGICAL SYSTEM	2	3,415	3,789	3,980	5,339	U	515
46 63710N	MAN MACHINE TECHNOLOGY	2			1,365	1,413	U	520
47 63712N	ADV MODUL COMPOB DEMONST	2	1,020				U	
48 63713N	OCEAN ENGINEERING TECH DEVELOPMENTS	2	14,819	11,624	13,194	22,171	U	525
49 63720N	EDUCATION AND TRAINING	2	4,742	3,691	3,496	4,438	U	532
50 63721N	ENVIRONMENTAL PROTECTION	2	2,913	6,693	8,151	12,614	U	538
51 63722N	NAVAL SPECIAL WARFARE	2	4,969	5,037	6,037	7,289	U	544
52 63727N	NAV TECH INFO PRESENT SYS	2	1,812	1,316	1,453	1,433	U	551
53 63728N	MANUFACTURING TECH	2	4,754	3,657	3,339	12,085	U	555
54 63732N	MC ADV MANPOWER TRAINING SYS	2	1,292	1,489	1,509	2,095	U	559
55 63733N	TRAINING DEVICE TECH	2	5,975	7,950	7,399	8,055	U	563
56 63734N	ABN ELECTRO-MAG/OPT SYS	2		8,057	8,790	9,423	U	570
57 63735N	ABN ELEC-MAG/OPT SYS	2	4,273				U	
58 63797N	SURF ELECTRO-MAGNETIC OPTICAL SYS	2	3,687				U	
59 64574N	TAC EMBEDDED COMPUTER PROG	2					U	

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60	64709N PROTO MWR/PERSONNEL SYS ADVANCED TECHNOLOGY DEVELOPMENT	2	149,898	152,186	165,122	242,849		U
61	63371N TRIDENT II MISSILE SYS	3	96,683	239,232	366,701	1,413,550	U	661
62	63451N SPACE TECHNOLOGY	3	2,346	7,966			U	
63	63588N SSBN SUB-SYSTEM TECHNOLOGY	3	13,808	4,508	4,898	12,325	U	673
64	63735N WWMCCS ARCHITECTURE	3	596	862	903	956	U	678
65	65856N STRATEGIC TECHNICAL SUPPORT	3	5,362	5,330	5,919	6,370	U	682
66	11221N FLEET BALLISTIC MISSILE SYSTEM	3	137,485	66,326	32,947	43,613	U	576
67	11224N SSBN SECURITY PROGRAM	3	42,312	36,729	36,691	59,766	U	591
68	11229N TRIDENT I	3	76,295	101,950	90,565	137,081	U	601
69	11401N EXTREMELY LOW FREQUENCY COMM	3	5,226	34,755	49,827	54,262	U	633
70	11402N NAVY STRATEGIC COMM	3	19,746	24,344	69,314	99,542	U	637
71	11403N HYDRUS	3	1,000	888			U	652
72	12427N NAV SPASUR	3	539	550	501	521	U	653
73	33131N MEECN	3	2,337	3,089	10,673	1,591	U	657
74	33151N WWMCCS - ADP STRATEGIC PROGRAM'S	3	1,044 404,779	526,529	668,939	1,829,577		U
75	63201N AIRBORNE ASW DETECTION SYS	4	2,116				U	
76	63206N ABN ELECTRONIC WARFARE EQUIPMENT	4	9,958	9,887	10,490	7,353	U	884
77	63208N VTX-TS	4	1,209	4,985	9,654	24,076	U	890

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78	63209N	UNDERWATER WEAPONS ACCEPT TEST	4				3,326 U		
79	63212N	TACAIR IR C/M	4	3,577	4,781	1,493	2,470 U		895
80	63213N	HELICOPTER IR C/M	4	2,723	5,323	5,732	6,118 U		899
81	63214N	TAC COMD/CNTRL/COMM C/M	4	2,499	6,284	7,258	7,755 U		903
82	63219N	ADV A/C ARMAMENT SYS	4	6,543	5,651	6,541	11,406 U		906
83	63220N	TILT FAN VSTOL	4		10,000	36,284	43,185 U		911
84	63221N	AV-8B	4		5,000		U		912
85	63228N	CV ASW MODULE	4	3,838	4,601	4,162	4,592 U		913
86	63230N	NATO CROSS CERTIFICATION	4	1,476			U		
87	63254N	AIR ASW	4	2,238	5,896	13,994	19,924 U		917
88	63257N	V/STOL ACFT DEV	4	4,304		6,700	16,800 U		924
89	63259N	ACOUSTIC SEARCH SENSORS	4	3,795	4,639	8,622	U		
90	63260N	AIRBORNE MINE COUNTERMEASURES	4	12,338	20,635	21,566	24,904 U		929
91	63261N	TACTICAL /AIRBORNE RECONNAISSANCE	4	3,553	5,019	5,670	2,669 U		940
92	63262N	ACFT SURVIVABILITY/VULNERABILITY	4	5,193	8,015	10,864	16,471 U		944
93	63266N	AH-1T COMP ROTOR BLADE	4	2,084	2,267		U		
94	63267N	COMBAT IDENTIFICATION SYS	4	2,500	2,488	6,694	6,669 U		950
95	63313N	IIR MAVERICK	4	4,473	9,508	4,992	2,075 U		954
96	63318N	ARMY/NAVY SAM TECH	4	5,216	13,218	14,169	12,843 U		958
97	63358N	WEAPONIZING (PROTO)	4				U		
98	63367N	COMMON ASW STDOFF WPN	4	19,027	39,578	41,999	58,167 U		962

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				FY 1981	FY 1982	FY 1983	FY 1984		
99	63369N	TOMAHAWK II	4	22,548	19,000	19,900	19,760	U	964
100	63370N	BVR AAM	4	22,509				U	
101	63381N	GUIDED MUNITIONS LAUNCHER	4					U	
102	63382N	BOAWC	4			6,456	12,726	U	971
103	60452N	VERY HIGH SPEED INTEG CIRCUITS	4					U	
104	63501N	REACTOR PROPULSION PLANTS	4	7,687	6,062	5,783	5,621	U	975
105	63502N	SURFACE MCM	4	22,288	40,547	31,572	25,389	U	979
106	63503N	ACOUSTIC COMMUNICATIONS	4	3,546	2,661	2,741	5,599	U	996
107	63504N	SUBMARINE SONAR DEV	4	35,031	45,523	18,371	20,034	U	999
108	63506N	SURFACE SHIP TORP DEF	4			2,447	5,281	U	1007
109	63509N	NEW SHIP DESIGN	4	16,994	7,900	4,911	6,437	U	1011
110	63513N	SHIPBOARD SYS COMPONENT DEVELOPMENT	4	5,124	8,142	15,452	13,710	U	1015
111	63514N	SHIPBOARD DAMAGE CONTROL	4	23,941	18,659	23,659	21,834	U	1026
112	63515N	ADVANCED IDENTIFICATION TECHNIQUES	4	992	3,810	2,247	772	U	1037
113	63516N	PAPAR SURVEILLANCE EQ	4				794	U	
114	63519N	ADVANCED COMMAND DATA SYSTEMS	4	362	2,359	4,412	5,026	U	1041
115	63520N	ADVANCED COMMUNICATIONS	4	3,911				U	
116	63521N	SURFACE ELEC WARFARE	4	5,033	3,915			U	1045
117	63522N	ADV SUB SUPT EQUIP PROG	4					U	1049
118	63523N	SMALL WATERPLANE AREA TWIN HULL SHIP DEVEL	4					U	
119	63524N	SUBPCS	4	11,889	39,707			U	1053

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PILOT FISH	4	34,817	57,388	93,823	99,766	U			1060
NON-ACGUSTIC ASW	4	12,984	11,164	11,533	15,053	U			1061
ADV ASW TARGET	4	759	832	3,919	10,684	U			1065
OVER-THE-HORIZON TARGETING	4	8,790	16,353				U		
HY 130 STEEL (NEW SSN MATERIAL)	4	1,533	955				U		1069
SHIPS SYSTEMS ENGINEERING STANDARDS	4	5,933	9,980	1,749	1,672	U			1072
SURFACE EFFECT SHIPS	4						U		
SEA BASS	4	23,300					U		
STANDOFF JAMMER SUPPRESSION	4						U		
RETRACT SILVER	4		63,446	94,365	105,644	U			1076
RETRACT AMBER	4	8,468	17,945	13,017	4,158	U			1077
DIESEL ELEC SUB	4	497	2,500				U		1078
SURFACE ASW	4	6,030	5,883	4,408	4,715	U			1080
SUBMARINES	4	34,079	53,563	44,413	64,342	U			1085
SUB TACTICAL WARFARE SYS	4	91,943	98,415	7,032	17,033	U			1107
SHIP CONFORM	4	28,632	9,994	18,810	26,857	U			1116
AMPHIB ASSAULT CRAFT	4	14,362	9,240	10,437	8,139	U			1120
COMBAT SYSTEMS ARCH	4	2,968	3,962	2,786	3,129	U			1128
ATTACK SUBMARINE DEV	4	28,908	4,968	10,959	20,974	U			1133
ADV REACTOR COMPONENTS/SYS DEV	4	5,226	9,090	11,536	15,166	U			1140
SHIPBOARD PHYSICAL SECURITY	4	4,016	4,594	6,560	6,091	U			1145

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141	63575N	SPECIAL TEST SYSTEMS	4	11,860					U	
142	63576N	CHALK EAGLE	4			6,401	13,896	U	1155	
143	63578N	A4W/AIG NUCLEAR PROP PLANT	4	10,624	11,649	12,238	12,706	U	1156	
144	63579N	D2W NUCLEAR PROP REACTOR	4	11,025	10,449	9,337	9,339	U	1161	
145	63580N	ADV DESIGN SUB NUCLEAR PROP	4	2,500				U		
146	63582N	COMBAT SYSTEM INTEGRATION	4	988	7,340	17,138	19,330	U	1166	
147	63589N	DDGX	4	75,300	100,644	138,595	117,614	U	1174	
148	63600N	WIDE APERTURE ARRAY ADV	4			23,614	14,707	U	1139	
149	63601N	MONITOR DEVELOPMENT	4	21,098	13,934	5,555	6,119	U	1199	
150	63610N	ALWT ADV	4	98,929	105,414	56,784	4,220	U	1298	
151	63611M	MC ASSAULT VEHICLES	4	38,591	56,299	73,414	85,805	U	1213	
152	63631N	TAC NUCLEAR WEAPON DEV	4	792	723	3,464	4,183	U	1227	
153	63635M	MC GRD COMBAT/SPT ARMS SYS	4	2,401	3,336	7,812	4,341	U	1231	
154	63691N	MK-18 ADCAP (ADV)	4			20,483		U	1238	
155	63702N	OCEAN ENGINEERING SYS DEVELOPMENT	4	3,327	3,099	2,320	2,257	U	1242	
156	63705N	LOGISTICS	4	6,788	12,215	3,339	1,844	U	1246	
157	63708N	ANTI-SUB WARFARE SIGNAL PROCESSING	4	10,138	7,626	5,202	6,546	U	1251	
158	63711N	FLEET TAC D/E PROGRAM	4	3,661	3,896	4,551	6,678	U	1256	
159	63717N	COMMAND AND CONTROL SYSTEMS	4	10,452	8,780	24,106	20,327	U	1261	
160	63719N	CONTAINER OFFLOAD/TRANSFER SYS	4	1,336	8,045	6,067		U	1273	
161	63724N	NAVY ENERGY PROGRAM	4	18,743	17,478	21,504	31,487	U	1277	

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162 63725N	FACILITIES IMPROVEMENT	4	3,230	3,194	5,919	9,064	U	1291
163 63726N	MERCHANT SHIP NAVAL AUG PROG (MSNAP)	4			5,773	5,690	U	1298
164 63729M	MC COMBAT SERVICE SPT	4	1,003	3,122	4,410	5,931	U	1302
165 63730M	MC INTEL/ELEC WARFARE SYS	4	8	2,209	7,024	6,242	U	1307
166 63731M	MC COMD/CNTRL/COMM SYS	4	283	1,490	2,753	494	U	1311
167 63734N	DEFENSE SUPPRESSION	4	291				U	
168 63736N	STRIKE WARFARE TECHNOLOGY	4	1,350				U	
169 63737N	LINK HAZEL	4			42,760	9,870	U	1315
170 63763N	ITSS	4	14,000	11,965	17,834	107,293	U	1316
171 63784N	ASW SURVEILLANCE (C)	4		1,235	1,284	4,280	U	1320
172 63785N	LRAP	4		10,814	12,578	16,898	U	1324
173 63787N	SPECIAL PROCESSES	4		46,337	72,523	68,923	U	1331
174 63788N	RDSS	4	13,348	6,763	19,312	21,646	U	1332
175 63794N	ASW SURVEILLANCE	4	3,149				U	
176 63795N	LRAP	4	10,340				U	
177 63798N	SPECIAL PROCESSES	4	26,041				U	
178 64273N	AVIONICS DEVELOPMENT/VAST	4	8,881	12,501	8,960	3,022	U	1337
179 64211N	AIMS/ATCRBS/MARK XII	4	3,152	4,363	6,228	8,650	U	1346
180 64212N	LAMP III	4	100,842	72,588	8,977		U	1351
181 64213N	HELICOPTER DEVELOPMENT	4	4,932	10,057	26,560	11,568	U	1366
182 64214N	AV-8B AIRCRAFT	4	236,371	226,413	114,071	67,133	U	1374

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183	64215N	SUPPORT EQUIPMENT	4	6,903	6,947	6,700	6,837	U	1381
184	64217N	RECONNAISSANCE SYS	4					U	
185	64217N	S-3 WEAPONS SYS IMPROVEMENT	4	14,738	41,702	78,344	55,733	U	1387
186	64218N	ENVIRONMENTAL SYSTEMS	4	533	461	356	595	U	1395
187	64219N	AIRBORNE ASW DEV	4	12,919	21,599	25,539	32,146	U	1399
188	64220N	ACFT IR SIGNATURE SUPPRESSION	4	1,322	1,400	1,495	1,598	U	1409
189	64221N	P-3 MODERNIZATION PROG	4	29,649	18,836	21,596	24,357	U	1413
190	64224N	ADAPTIVE ECM	4	1,306				U	
191	64225N	ADV RADAR WARNING SYS	4	2,647	383			U	1424
192	64226N	ASPJ	4	28,137	23,665	29,331	15,068	U	1428
193	64227N	HARPOON MODIFICATION	4			1,840	1,821	U	1441
194	64228N	SH-60 CV VARIANT	4			9,868	43,354	U	1444
195	64254N	CH-46E RANGE EXT TANKS	4					U	
196	64255N	A'R ELECTRONIC WARFARE	4	10,206	11,690	13,394	16,931	U	1448
197	64260N	CH-53E	4	6,006	10,941	11,201	7,904	U	1454
198	64261N	ACOUSTIC SEARCH SENSORS	4	19,344	18,121	14,800	4,801	U	1456
199	64262N	HXM	4			9,522	24,094	U	1466
200	64263N	F/A-18	4	170,856	190,000	109,224		U	1468
201	64264N	LIFE SUPPORT EQUIP	4	11,615	10,674	6,902	7,284	U	1482
202	64266N	ADV SIGNAL PROCESSOR	4	7,199	3,292	3,525		U	1486
203	64267N	AWG-9 UPDATE	4	24,216	4,206	6,976	3,079	U	1490

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204	64268N	ACFT ENGINE COMPONENT IMPROVE PROG	4	71,202	82,338	89,486	96,620	U	1495
205	64301N	MK-92 FCS UPGRADE	4		17,701	9,628	14,445	U	1502
206	64303N	AEGIS	4	16,807	34,196	8,158	8,376	U	1506
207	64304N	CSEDS	4	26,262	16,056	12,232	5,558	U	1518
208	64306N	PENGUIN COMBAT DEV	4	5,892	3,658	1,623	477	U	1524
209	64307N	CG-47 AEGIS PRODUCT IMPROV	4			45,147	61,058	U	1528
210	64314N	AMRAAM	4		4,994	4,714	6,918	U	1537
211	64352N	SURFACE LAUNCHED WEAPONRY SYS TECH	4	38,352	42,505	3,413	3,372	U	1545
212	64353N	VERTICAL LAUNCHING SYSTEM	4	67,672	70,424	33,878	26,832	U	1549
213	64354N	AIR/AIR MSL SYS ENGR	4	37,062	35,350	23,844		U	1564
214	64358N	CLOSE-IN WPN SYS (PHALANX)	4	2,105	1,371	1,387	1,328	U	1578
215	64360N	HI-SPEED ANTI-RADIATION MSL	4	72,641	20,898	1,932	1,876	U	1583
216	64361N	NATO SEA SPARROW	4	3,507	3,467	1,067		U	1595
217	64365N	SM-2	4	4,000	13,193	18,810	18,783	U	1600
218	64366N	STANDARD MISSILE IMPROVEMENTS	4	64,618	50,592	50,788	62,381	U	1604
219	64367N	TOMAHAWK CRUISE MSL	4	133,922	141,735	78,934	26,362	U	1626
220	64369N	5\ ROLLING AIR FRAME MSL	4	14,040	19,488	16,290	3,326	U	1640
221	64370N	SSN-688 VLS	4	8,916	37,488	35,362	26,830	U	1647
222	64371N	HELLFIRE	4			9,815	2,879	U	1655
223	64372N	NEW THREAT UPGRADE	4			41,881	41,598	U	1657
224	64373N	TARTER SM-2	4					U	

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225	64375N	SPY-1B RADAR	4					U	
226	64377N	SM-3	4					U	
227	64502N	SUBMARINE COMMUNICATIONS	4	8,353	7,187	8,584	8,314	U	1666
228	64503N	SUBMARINE SONAR DEV	4	32,026	40,403	41,770	36,883	U	1672
229	64504N	AIR CONTROL	4	8,068	9,591	9,251	24,163	U	1677
230	64505N	SSN INTEGRATED COMM CENTER SYS	4		8,820			U	1687
231	64506N	CW COUNTERMEASURES	4	3,710	7,740	8,357	8,398	U	1691
232	64507N	EMSP	4			14,497	15,257	U	1696
233	64508N	RADAR SURVEILLANCE EQ	4	11,036	15,409	10,488	8,968	U	1700
234	64510N	COMMUNICATIONS SYSTEMS	4	8,456	3,178	4,693	238	U	1707
235	64511N	INTELLIGENCE SYSTEMS	4	2,262	2,708	2,478	5,206	U	1711
236	64515N	SUB SUPT EQUIP PROG ENG	4					U	1714
237	64516N	SHIP SURVIVABILITY PROTOTYPES	4			4,778	7,808	U	1718
238	64518N	CIC CONVERSION	4	5,937	9,420	27,014	23,148	U	1723
239	64519N	COMBAT SYS INTERFACE	4					U	
240	64524N	SUBACS ENG	4		29,664	85,937	137,515	U	1736
241	64526N	LHDX	4		15,000			U	1748
242	64554N	SURFACE ELEC WARFARE	4	11,398	8,540	6,673	11,245	U	1751
243	64561N	SUBMARINES	4	1,699	2,041	1,950	2,229	U	1761
244	64562N	SUB TACTICAL WARFARE SYS	4	33,768	95,242	32,598	34,720	U	1765
245	64566N	ACOUSTIC COMMUNICATIONS	4	3,229	5,099	4,898	2,850	U	1786

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246	64567N	SHIP SUBSYS DEV/LBYS	4	45,717	66,394	24,430	28,642 U		1792
247	64569N	NATO SEA GNAT	4	2,078	7,007	6,588	3,056 U		1796
248	64573N	SHIPBOARD ELECTRONIC WARFARE IMPROV	4	7,543	15,917	14,974	17,684 U		1800
249	64574N	TAC EMBEDDED COMPUTER PROG	4	17,313	21,979	21,704	13,323 U		1804
250	64575N	AN/SQS-53C	4			35,980	22,387 U		1811
251	64576N	INFLUENCE MCM	4			5,820	12,709 U		1816
252	64601N	MINE DEVELOPMENT	4	7,415	6,916	12,712	10,464 U		1820
253	64602N	GUN AMMUNITION IMPROVEMENT	4	11,545	2,641	755	1,182 U		1827
254	64603N	UNGUIDED CONVL AIR LAUNCHED WEAPONS	4	15,116	22,249	7,978	1,946 U		1832
255	64604N	CHEMICAL WARFARE WEAPONS	4		7,497	8,066	3,458 U		1840
256	64607N	ELECTRO OPTICS SENSOR DEV	4	17,035	6,891	10,422	10,975 U		1844
257	64608N	A/N SAL GP(ENG)	4	22,753	3,116	995		U	1849
258	64609N	COMMON BOMB FUZE	4	1,600	1,597	1,306		U	1853
259	64610N	ALWT (ENG)	4			58,365	141,185 U		1856
260	64652N	GUN FCS IMP PROG	4	27,956	10,393	10,969	10,648 U		1861
261	64654N	JT SERV EXPLOSIVE ORD DEV	4	2,248	2,477	2,926	3,805 U		1867
262	64656M	MC ASSAULT VEHICLES	4			15,610	15,072 U		1871
263	64657M	MC ORD COMBAT/SPT ARMS SYS	4	18,236	23,377	10,724	16,618 U		1875
264	64658N	MK-86 GFCS	4					U	
265	64675N	MK-48 ADCAP (ENG)	4			166,271	111,483 U		1885
266	64701N	PROTO CARRIER OPER TEST/EVAL SITE	4					U	

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267	64710N	NAVY ENERGY PROGRAM	4	11,975	15,984	18,704	28,394	U		1987
268	64711N	COMMAND AND CONTROL SYSTEMS	4	9,476	10,629	15,505	20,161	U		1908
269	64713N	TACTAS AN-SQR 19	4	24,624	15,862	9,882	2,852	U		1916
270	64714N	AIR WARFARE TNG DEV	4	13,881	27,889	20,089	8,572	U		1922
271	64715N	SURFACE WARFARE TNG DEV	4	34,428	41,748	32,838	48,258	U		1925
272	64716N	SUBMARINE WARFARE TNG DEV	4	2,908	4,553	3,226		U		1947
273	64717M	MC COMBAT SERVICE SPT	4	2,010	3,728	3,009	3,812	U		1952
274	64718M	MC INTEL/ELEC WARFARE SYS	4	2,815	1,988	2,736	9,237	U		1957
275	64719M	MC COMD/CNTRL/COMM SYS	4	62,291	48,573	27,888	25,899	U		1961
276	64720M	TACAIR OPER CENTRAL 85	4			12,736	4,468	U		1971
277	64745N	NAV INTEG/BTFLD EXPLOIT TOT ACQ	4	2				U		
278	64761N	INTELLIGENCE	4	5,189	6,069	13,092	9,099	U		1974
279	64771N	MEDICAL DEVELOPMENTS	4	1,329	2,047	2,314	2,484	U		1979
280	64779N	JINTACCS	4	8,245	5,505	6,395	11,518	U		1983
281	64780M	JINTACCS MC	4	1,030	1,249	1,899	7,620	U		1987
282	64789N	SURV TOWED ARRAY SENSOR	4	6,789			2,345	U		
283	65155N	FLEET TACTICAL DEV/EVAL	4	17,070	17,257	18,316	22,882	U		1990
284	65803N	ELECTROMAGNETIC SPECTRUM MGT	4					U		
285	65853N	MANAGEMENT AND TECHNICAL SUPPORT	4	12,335	12,546	11,685	13,862	U		2000
286	65856N	TACTICAL ELECTRO SUPPORT	4	4,308	4,210	4,005	4,128	U		2009
287	65867N	C2 SURVEILLANCE/RECON SPT	4	3,597	1,894	2,820	5,116	U		2014

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288	65871M	TAC EXPLOITATION OF NATL CAPABILITY	4		248	360	374	U	2018
289	24134N	A-6 SQUADRONS	4	7,624	9,978	4,725	3,014	U	687
290	24136N	F/A-18 ATTACK SQDNS	4				19,389	U	
291	24152N	EARLY WARNING ACFT SQUADRONS	4	18,756	18,925	52,291	47,008	U	691
292	24161N	AVIATION SPT CVW	4	2,384	7,957	7,968	1,911	U	695
293	24163N	FLEET TELECOMMUNICATIONS (TAC)	4	15,381	34,282	21,140	33,958	U	700
294	24226N	PATROL COMBATANTS-HICANS	4		292			U	
295	24281N	SUBMARINES	4	5,710	7,429	6,464	9,496	U	712
296	24304N	MINES/MINE SUPPORT	4	6,393	2,930	1,481	1,123	U	718
297	24311N	UNDERSEA SURVEILLANCE SYS	4	51,244	48,598	49,649	68,904	U	722
298	24313N	SURTASS	4		6,364	7,070		U	740
299	24571N	SPECIAL PROJECTS	4			6,720	11,850	U	745
300	24573N	COVER AND DECEPTION PROGRAM	4	7,798	13,305	14,312	12,794	U	750
301	24575N	ELECTRONIC WARFARE SPT PROJECTS	4	5,431	18,509	8,014	10,581	U	758
302	24576N	C3 COUNTER-MEAS DEVEL	4			11,533	17,900	U	765
303	25604N	JTIDS	4	31,251	48,079	100,330	87,399	U	769
304	25620N	ASW COMBAT SYSTEMS INTEGRATION	4	14,184	20,866	16,135	14,589	U	776
305	25623N	SURF SHIP SONAR MODERNIZATION	4	19,181	13,973	8,003	9,942	U	780
306	25624N	AN/SQR-18 IMPROVEMENT	4	5,380	6,611	4,839	4,645	U	788
307	25633N	ACFT EQ REL/MAINT PROG	4	6,462	8,231	7,067	8,453	U	792
308	25634N	SUBMARINE SILENCING	4	18,190	15,363	9,283	10,706	U	797

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309	25645N	MODULAR GUIDED GLIDE WPN IMP	4	799	2,117	5,260	1,567	U	801
310	25658N	LAB FLEET SUPPORT	4	2,273	4,283	4,669	5,368	U	805
311	25662N	ACFT PROPULSION EVAL GENERAL	4	2,693	2,000	2,835	3,114	U	811
312	25663N	ACFT FLIGHT TEST GENERAL	4	1,830	897	953	1,018	U	816
313	25667N	F-14A	4	11,723	16,965	14,724	17,455	U	820
314	25670N	TACTICAL INTELL PROCESSING	4	1,317	2,721	1,842	1,809	U	825
315	25674N	EW COUNTER RESPONSE	4	9,050	10,566	12,633	15,888	U	829
316	25675N	OPERATIONAL REACTOR DEV	4		2,344	2,655	3,397	U	833
317	26313M	MARINE CORPS TELECOMMUNICATIONS	4	2,247	1,713	2,266	3,029	U	835
318	26623M	MC GRD COMBAT/SPT ARMS SYS	4	1,583	1,635	3,093	9,289	U	842
319	26624M	MC COMBAT SERVICE SPT	4	407	368	378	657	U	845
320	26625M	MC INTEL/ELEC WARFARE SYS	4	471		779	590	U	850
321	26626M	MC COMD/CNTRL/COMM SYS	4	8,091	12,194	18,447	24,240	U	853
322	26627M	MC TAC SUPT C/C SYS	4			2,798	2,859	U	862
323	28008N	AMRAAM GUE	4					U	
324	28009N	TOMAHAWK CRUISE MISSILE	4			18,010	24,305	U	865
325	28010M	TRI-TAC MC	4	9,193	16,343	15,543	11,287	U	868
326	28010N	TRI-TAC NAVY	4	13,533	9,208	9,374	9,114	U	876
327	33109N	SATELLITE COMMUNICATIONS	4					U	
328	33151N	WMMCCS - ADP	4					U	

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329	35128N	SECURITY/INVESTIGATIVE ACTYS	4					U	
330	99403N	CONSULTANTS STUDIES AND ANALYSES	4					U	
		TACTICAL PROGRAMS		3,107,230	3,546,340	3,678,065	3,671,318		
331	63401N	NAVIGATION SATELLITE OPS	5	4,868				U	
332	63511N	AIR CONTROL	5				1,167	U	
333	63518N	ADVANCED NAVIGATION DEVELOPMENT	5	1,608	2,142	476	476	U	2052
334	63735N	WWMCCS ARCHITECTURE	5					U	
335	64514N	NAVIGATION SYSTEMS	5	5,210	5,649	3,820	1,487	U	2055
336	64577N	EHF SATCOM	5			43,826	61,149	U	2060
337	64777N	NAVSTAR	5		34,000	39,822	97,440	U	2071
338	64778N	NAVSTAR GPS EQUIP	5	17,136				U	
339	65803N	ELECTROMAGNETIC SPECTRUM MGT	5	5,700	5,498	4,589	7,532	U	2083
340	65868N	C2 SYS PLANNING/ENGINEERING SPT	5	3,271	4,215	5,080	8,838	U	2087
341	24226N	PATROL COMBATANTS	5					U	
342	31303N	FIELD OPERATIONAL INTELLIGENCE OFFICE	5	511				U	
343	31309N	INTELLIGENCE SUPPORT CENTER	5	322	237			U	2021
344	31325N	PRAIRIE WAGON	5	3,906				U	
345	31326N	PRAIRIE SCHOONER	5	6,278	5,221	5,072	17,339	U	2023
346	31327N	TECHNICAL RECONNAISSANCE & SURVEILLANCE	5	3,944	5,384	4,073	11,005	U	2027
347	31335N	ADP GDIP SUPPORT	5				606	U	

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348	31355N	INTEGRATED AUTOMATED INTELLIGENCE PROCESSING	5	491					U
349	33109N	SATELLITE COMMUNICATIONS	5	5,357	36,580	1,632	905	U	2032
350	33126N	LONG HAUL COMMUNICATIONS (DCS)	5	2,423	1,166	1,965	625	U	2038
351	33401N	COMSEC	5					U	2042
352	34111N	SPECIAL ACTIVITIES	5	82,606	101,690	120,380	160,176	U	2051
		INTELLIGENCE AND COMMUNICATIONS		152,866	215,274	247,606	400,136		
353	63799N	R+D FUTURE OPTIONS	6					U	
354	64208N	RANGE INSTRUMENTATION SYS DEV	6	13,276	10,317	12,392	17,235	U	2103
355	64218N	ENVIRONMENTAL SYSTEMS	6					U	
356	64258N	TARGET SYSTEMS DEV	6	43,045	56,803	43,901	48,112	U	2112
357	64703N	TRAINING DEVICES PROTOTYPE DEV	6	13,899	10,361	6,575	3,743	U	2120
358	64709N	PROTO MPWR/PERSONNEL SYS	6	979	4,997	2,152	3,963	U	2126
359	65151M	STUDIES AND ANALYSIS SUPPORT (MC)	6	2,309	2,776	2,146	2,619	U	2130
360	65152N	STUDIES AND ANALYSIS SUPPORT (NAVY)	6	6,422	7,791	7,669	8,291	U	2135
361	65153M	MCOAG	6	2,020	2,461	2,754	2,677	U	2139
362	65154N	CENTER FOR NAVAL ANALYSIS (NAVY)	6	10,393	11,351	12,445	13,361	U	2142
363	65155N	FLEET TACTICAL DEV/EVAL	6					U	
364	65156M	MAR CORPS OPERATIONAL TEST/EVAL	6	1,164	1,205	3,350	1,674	U	2145
365	65604N	TECHNICAL INFORMATION SERVICES	6	1,166	1,456	1,665	1,735	U	2148
366	65652N	AUTEC	6	26,553	36,150	45,656	50,334	U	2153
367	65654M	DEVELOPMENT CENTER SUPPORT	6	3,510	5,422	3,596	3,604	U	2157

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368	65F55N	NARL PT BARROW	6	3,885					U	
369	65857N	INTERNATIONAL RDT/E	6	966	1,679	1,935	2,264	U		2160
370	65859N	MOBILE SEA RANGE	6	5,171	7,024	3,229	5,046	U		2164
371	65861N	RDTE LAB/FAC MGT SPT	6	48,844	52,159	59,101	66,237	U		2168
372	65862N	RDTE INSTRUMENTATION/MATERIAL SPT	6	38,305	43,511	31,707	30,710	U		2177
373	65863N	RDTE SHIP/AIRCRAFT SPT	6	52,425	60,773	69,847	79,535	U		2185
374	65864N	TEST/EVALUATION SPT	6	215,579	240,320	274,106	301,813	U		2193
375	65865N	OPERATION-TEST/EVAL CAPABILITY	6	5,231	5,770	6,772	6,556	U		2205
376	65869N	RDTE OSHA SUPPORT	6					U		
377	65870N	STRATEGIC SYSTEMS TEST SUPPORT	6	4,647	19,046	17,658	8,616	U		2211
378	65871M	TAC EXPLOITATION OF NATL CAPABILITY	6					U		
379	65872N	PRODUCTIVITY INVESTMENT	6		7,490	4,410	2,322	U		2219
380	65873N	LONG RANGE PLANNING SUPPORT	6		900	1,281	1,311	U		2221
381	25633N	AIRCRAFT EQ R/M IMPROVEMENT PROG	6					U		
382	25658N	LAB FLEET SUPPORT	6					U		
383	25662N	ACFT PROPULSION EVAL GENERAL	6					U		
384	25663N	ACFT FLIGHT TEST GENERAL	6					U		
385	35111N	WEATHER SERVICE	6	2,998	2,867	1,188	1,091	U		2091
386	35128N	SECURITY/INVESTIGATIVE ACTYS	6			689	729	U		2096

DEPARTMENT OF THE NAVY
FY 1963 R D T & E PROGRAM

EXHIBIT R-1

APPROPRIATION: 1319 N RESEARCH DEVELOPMENT TEST + EVAL, NAVY

DATE: 08 FEB 1962

DESCRIPTIVE
SUMMARY

THOUSANDS OF DOLLARS

PAGE NO.

PROGRAM LINE ELEMENT NO NUMBER	ITEM NOMENCLATURE	ACT	FY 1961	FY 1962	FY 1963	FY 1964	
387	35160N DEF METEOROLOGICAL SATELLITE PROG	8	1,901	1,350	1,316	1,085	U 2099
388	88751N CIVILIAN EDUCATION/TRAINING/DEV	6	615	1,000	1,157	1,378	U 2223
	DEFENSEWIDE MISSION SUPPORT		507,345	596,999	618,921	686,461	
TOTAL	RESEARCH DEVELOPMENT TEST + EVAL, NAVY		5,024,866	5,807,131	6,232,300	7,746,511	

DEPARTMENT OF DEFENSE, MILITARY
RDT&E, NAVY
PERFORMER DISTRIBUTION
(\$ in Thousands)

	<u>Total Obligational Authority</u>			
	<u>FY 1981</u>	<u>FY 1982</u>	<u>FY 1983</u>	<u>FY 1984</u>
ration of installations of the reporting DOD Component-- ent operated-----	1,405,427	1,497,207	1,545,818	1,622,959
ration of installations of the reporting DOD Component-- tor operated-----	---	---	---	---
tracts directly in support of work actually performed at ations of the reporting DOD Component-----	707,163	803,886	858,613	910,680
* assigned to other Department of Defense activities----	70,209	78,676	94,931	126,622
* assigned to activities of other Government agencies---	19,918	24,179	32,286	38,844
< performed by industrial contractors ("Profit" ations)-----	2,523,503	3,061,968	3,330,301	4,411,926
< performed by education institutions: ignated Federal Contract Research Centers-----	18,922	25,407	30,671	34,007
er Institutions-----	228,601	249,571	252,731	309,683
* performed by other "non-profit" organizations: ignated Federal Contract Research Centers-----	6,246	7,195	10,418	12,300
er Institutions-----	44,877	59,042	76,531	279,490
Research and Development appropriation-----	5,024,866	5,807,131	6,232,300	7,746,511

INSTALLATION ANALYSIS

This installation analysis reflects the financing and manpower for Navy RDT&E installations, including contractor-operated installations, required in the accomplishment of the Navy's in-house research, development, test and evaluation effort. The installations reported include both installations classified as research, development, or test installations and research, development, or test units located at multi-mission installations. The funds reported cover both direct costs and indirect or overhead costs identifiable with the operation of the research, development, or test installation or unit. The RDT&E, Navy funds are included in various projects through the RDT&E,N budget and represent those funds received directly through respective Navy management bureaus, and other Navy command channels. The other DOD RDT&E funds finance RDT&E effort performed for the Army, Air Force and/or Defense Agencies. "All Other Funds" include reimbursable in-house effort performed for other Navy and DOD activities and for other government agencies. Military personnel costs provide for those military personnel in R&D work at RDT&E,N installations and other military personnel located at the installation or unit.

The numbers of personnel are reported in terms of work-years. The civilian personnel work-years include those work-years charged directly to the RDT&E,N appropriation and RDT&E,N reimbursements as reflected in the personnel summary (page 10), and the work-years paid from the Navy Industrial Fund and charged indirectly to the RDT&E,N appropriation and to other customer appropriations. The contractor personnel reported are those engaged in direct support of Navy installations.

DEPARTMENT OF DEFENSE, MILITARY
RDT&E, NAVY
INSTALLATION ANALYSIS
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INSTALLATION ANALYSIS - IN-HOUSE

Installation and Location		TOA (\$ in Thousands)									PERSONNEL (WORK-YEARS)								
		RDT&F Funds				All		Mil Pers			Civil Service			Contractor		Mil Pers		Total	
		Mgmt	Other	Other		Other					Paid	Paid	Paid	Paid	Paid	In			
		FY	Bureau	Navy	DOD	Funds ^{a/}	Subtotal	RDT&EN	Other	RDT&EN	RDT&E	Other	RDT&EN	Other	RDT&EN	Other			
David W. Taylor	81	154,770	4,903	3,306	60,936	223,915	1,420	-	225,335	1,954	92	564	129	-	76	-	2,815		
Naval Ship R&D	82	183,944	3,658	4,806	34,472	226,880	1,619	-	228,499	1,955	71	492	156	-	76	-	2,750		
Center,	83	190,780	2,327	5,041	36,160	234,308	1,749	-	236,057	2,012	114	414	156	-	76	-	2,772		
Bethesda, MD	84	202,227	2,467	5,343	38,330	248,367	1,749	-	250,116	2,012	114	414	156	-	76	-	2,772		
Naval Air	81	171,955	1,440	3,768	76,693	253,856	5,902	-	259,758	1,552	49	619	134	-	267	-	2,621		
Development	82	182,404	5,064	4,627	60,045	252,140	6,528	-	258,668	1,499	47	598	140	-	259	-	2,543		
Center,	83	195,258	2,446	4,879	63,328	265,911	7,158	-	273,069	1,516	48	605	155	-	263	-	2,587		
Warminster, PA	84	206,973	2,593	5,172	67,128	281,866	7,104	-	288,970	1,516	48	605	155	-	261	-	2,585		
Naval Air	81	27,300	965	836	2,366	31,467	251	-	31,718	525	4	60	9	-	8	-	606		
Propulsion	82	27,023	1,384	235	648	29,290	270	-	29,560	567	2	20	9	-	8	-	606		
Center,	83	44,928	2,105	200	600	47,833	290	-	48,123	559	2	20	9	-	8	-	598		
Trenton, NJ	84	51,696	2,052	200	536	54,484	312	-	54,796	559	2	20	9	-	8	-	598		
Naval Air Test	81	105,375	4,086	364	50,568	160,393	25,331	920	186,644	1,344	6	690	215	428	1,457	40	4,180		
Center,	82	115,553	4,711	353	52,739	173,356	27,674	940	201,970	1,347	6	690	370	580	1,445	40	4,478		
Patuxent	83	114,610	4,855	382	57,009	176,856	30,224	965	208,045	1,338	6	675	478	680	1,368	40	4,585		
River, MD	84	117,817	5,292	416	57,277	180,802	33,016	980	214,798	1,338	6	675	478	680	1,376	40	4,593		
Civil	81	18,050	4,249	891	5,938	29,128	318	-	29,446	255	8	75	-	-	14	-	352		
Engineering	82	26,400	4,340	910	6,980	38,630	385	-	39,015	237	8	75	-	-	16	-	336		
Laboratory,	83	22,560	4,700	910	8,650	36,820	408	-	37,228	237	8	75	-	-	16	-	336		
Port Hueneme, CA	84	20,920	13,770	910	6,970	42,570	432	-	43,002	237	8	75	-	-	16	-	336		

^{a/} Excludes Military Personnel and Military Construction

INSTALLATION ANALYSIS - IN-HOUSE

TOA (\$ in Thousands)										PERSONNEL (WORK-YEARS)								
Installation and Location	FY	RDT&E Funds			All Other Funds ^{a/}	Subtotal	Mil Pers			Civil Service			Contractor		Mil Pers			
		Mgmt	Other	Other			Paid	Paid	Paid	Paid	Paid	In	RDT&EN Work	Other	Total			
		Bureau	Navy	DOD			From RDT&EN	From RDT&E	From Other	From RDT&EN	From Other							
Naval Coastal Systems Center	81	33,975	833	1,308	19,296	55,412	1,956	-	57,368	426	32	206	95	-	105	-	864	
	82	40,753	275	260	18,203	59,491	2,442	-	61,933	431	20	180	101	-	115	-	847	
Panama City,	83	41,958	162	1,238	14,012	57,370	2,661	-	60,031	467	11	160	125	-	116	-	879	
FL	84	44,476	172	1,312	14,853	60,813	2,821	-	63,634	467	11	160	125	-	123	-	886	
Naval Ocean Systems Center, San Diego, CA	81	169,101	9,968	23,452	76,210	278,731	4,646	-	283,377	1,544	334	699	212	-	277	-	3,066	
	82	181,625	7,445	22,117	77,662	288,849	5,230	-	294,079	1,478	320	669	212	-	274	-	2,953	
	83	182,844	4,782	11,434	78,940	278,000	5,648	-	283,648	1,626	194	677	215	-	274	-	2,986	
	84	193,815	5,069	12,120	83,676	294,680	5,669	-	300,349	1,626	194	677	215	-	275	-	2,987	
Naval Research Laboratory Washington, DC	81	72,369	120,371	24,795	56,406	273,941	3,173	-	277,114	2,657	197	484	-	-	148	-	3,486	
	82	77,883	133,082	27,075	61,589	299,629	3,406	-	303,035	2,645	196	484	-	-	139	-	3,464	
	83	79,024	141,876	28,350	64,488	313,738	3,750	-	317,488	2,570	191	470	-	-	143	-	3,374	
	84	85,978	154,360	30,845	70,162	341,345	4,012	-	345,357	2,570	191	470	-	-	143	-	3,374	
Naval Surface Weapons Center Dahlgren, VA	81	191,186	21,464	51,998	120,597	385,245	2,387	-	387,632	2,721	534	1,633	240	-	117	-	5,245	
	82	184,997	20,769	50,315	116,694	372,775	2,628	-	375,403	2,734	534	1,406	240	-	113	-	5,027	
	83	192,315	21,591	52,305	121,311	387,522	2,838	-	390,360	2,745	565	1,422	240	-	113	-	5,085	
	84	203,854	22,886	55,443	128,590	410,773	2,863	-	413,636	2,745	565	1,422	240	-	114	-	5,086	
Pacific Missile Test Center, Point Mugu, CA	81	119,702	15,073	6,579	107,958	249,312	13,814	-	263,126	3,550	5	90	177	908	845	-	5,575	
	82	164,553	21,775	5,863	109,644	301,835	15,501	-	317,336	3,593	5	95	190	1,040	874	-	5,797	
	83	166,889	23,141	6,789	115,133	311,952	16,532	-	328,484	3,565	5	95	203	1,189	846	-	5,903	
	84	156,119	24,187	8,651	127,476	316,433	17,911	-	334,344	3,565	5	95	222	1,331	862	-	6,080	

^{a/} Excludes Military Personnel and Military Construction

INSTALLATION ANALYSIS - IN-HOUSE

Installation and Location	FY	TOA (\$ in Thousands)								PERSONNEL (WORK-YEARS)								
		RDT&E Funds			All Other Funds ^{a/}	Subtotal	Mil Pers		Total	Civil Service			Contractor		Mil Pers			
		Mgmt Bureau	Other Navy	Other DOD			RDT&EN	Other		Paid From	Paid From	Paid From	Paid From	Paid From	In			
										RDT&EN	Other	RDT&EN	Other	RDT&EN	Other	Work	Other	Total
Naval	81	184,411	1,858	2,730	259,243	448,242	2,429	-	450,671	1,453	49	1,442	251	-	123	-	3,318	
Underwater	82	209,259	1,967	2,890	260,494	474,610	2,769	-	477,379	1,374	46	1,364	277	-	123	-	3,184	
Systems	83	223,029	2,153	3,163	267,104	495,449	3,015	-	498,464	1,390	47	1,379	287	-	124	-	3,227	
Center, Newport, RI	84	236,411	2,282	3,353	283,130	525,176	3,064	-	528,240	1,390	47	1,379	287	-	126	-	3,229	
Naval Weapons	81	180,467	4,445	53,638	121,548	360,098	10,332	-	370,430	2,226	745	1,359	330	-	562	-	5,222	
Center	82	197,480	3,986	55,928	129,883	387,277	12,365	-	399,642	2,110	609	1,337	330	-	590	-	4,976	
China Lake,	83	216,575	4,205	58,999	128,763	408,542	13,353	-	421,895	2,374	531	1,215	700	-	590	-	5,410	
CA	84	229,570	4,457	62,539	136,489	433,055	13,512	-	446,567	2,374	531	1,215	700	-	597	-	5,417	
Subtotal, Navy	81	1,428,661	189,655	173,665	957,759	2,749,740	71,959	920	2,822,619	20,207	2,055	7,921	1,792	1,336	3,999	40	37,350	
Industrial Fund	82	1,591,874	208,456	175,379	929,053	2,904,762	80,817	940	2,986,519	19,970	1,864	7,410	2,025	1,620	4,032	40	36,961	
(NIF)	83	1,670,770	214,343	173,690	955,498	3,014,301	87,626	965	3,102,892	20,399	1,722	7,207	2,568	1,869	3,937	40	37,742	
Installations	84	1,749,856	239,587	186,304	1,014,617	3,190,364	92,465	980	3,283,809	20,399	1,722	7,207	2,587	2,011	3,977	40	37,943	
<u>Navy Non-NIF</u>																		
<u>Installations</u>																		
Environmental	81	4,730	505	-	-	5,235	348	-	5,583	40	-	-	-	-	16	-	56	
Prediction	82	6,933	678	-	-	7,611	386	-	7,997	40	-	-	-	-	16	-	56	
Research	83	7,510	624	-	-	8,134	425	-	8,559	40	-	-	-	-	16	-	56	
Facility, Monterey, CA	84	7,956	668	-	-	8,624	468	-	9,092	40	-	-	-	-	16	-	56	

a/ Excludes Military Personnel and Military Construction

INSTALLATION ANALYSIS - IN-HOUSE

Installation and Location		TOA (\$ in Thousands)								PERSONNEL (WORK-YEARS)								
		RD&E Funds			All		Mil Pers			Civil Service			Contractor		Mil Pers		Total	
		Mgmt	Other	Other	Other	Subtotal	RD&EN	Other	Paid	Paid	Paid	Paid	Paid	In				
		Bureau	Navv	DOD	Funds ^{a/}				From	From	From	From	From	RD&EN	Other			
FY										RD&EN	RD&E	Other	RD&EN	Other	Work	Other		
Naval Biodynamics Laboratory	81	3,556	294	15	-	3,865	386	-	4,251	48	-	3	-	-	15	-	66	
New Orleans	82	3,280	-	-	-	3,280	917	-	4,197	51	-	3	-	-	31	-	85	
Louisiana	83	3,648	-	-	-	3,648	926	-	4,574	51	-	3	-	-	31	-	85	
	84	4,377	-	-	-	4,377	935	-	5,312	51	-	3	-	-	31	-	85	
Naval Aerospace Medical Research Laboratory	81	2,118	978	55	217	3,368	838	-	4,206	51	-	10	-	-	42	-	103	
Pensacola, FL	82	2,298	771	131	26	3,226	986	-	4,212	51	-	10	-	-	43	-	104	
	83	2,556	848	141	29	3,574	995	-	4,569	51	-	10	-	-	43	-	104	
	84	2,711	880	154	31	3,776	1,005	-	4,781	51	-	10	-	-	43	-	104	
Commander, Operational Test & Evaluation Force, Norfolk VA	81	5,171	304	-	1,054	6,529	7,517	-	14,046	42	-	-	37	-	332	-	411	
	82	6,264	330	-	2,257	8,851	8,569	-	17,420	43	-	-	37	-	332	-	412	
	83	6,993	358	-	2,337	9,688	8,569	-	18,257	43	-	-	37	-	332	-	412	
	84	7,549	388	-	2,536	10,473	8,569	-	19,042	43	-	-	37	-	332	-	412	
Naval Arctic Research Laboratory ^{b/}	81	3,862	-	-	2,581	6,443	-	-	6,443	-	-	-	55	11	-	-	66	
Barrow, AK	82	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	83	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	84	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Naval Biosciences Laboratory	81	2,035	-	-	692	2,727	220	-	2,947	6	-	-	90	-	9	-	105	
Oakland, CA	82	2,300	-	-	390	2,690	235	-	2,925	6	-	-	90	-	9	-	105	
	83	2,300	-	-	195	2,495	235	-	2,730	6	-	-	90	-	9	-	105	
	84	2,450	-	-	184	2,634	235	-	2,869	6	-	-	90	-	9	-	105	

^{a/} Excludes Military Personnel and Military Construction
^{b/} This activity transfers from RD&E,N to O&M,N in FY 1982

INSTALLATION ANALYSIS - IN-HOUSE

Installation and Location	FY	TOA (\$ in Thousands)							PERSONNEL (WORK-YEARS)								
		RDT&E Funds			All Other Funds ^{a/}	Subtotal	Mil Pers		Total	Civil Service			Contractor		Mil Pers In RDT&EN	Other	Total
		Mgmt	Other	Other						Paid From	Paid From	Paid From	Paid From	Paid From			
		Bureau	Navy	DOD			RDT&EN	Other		RDT&EN	RDT&E	Other	RDT&EN	Other			
Naval Dental	81	872	-	-	-	872	740	-	1,612	14	-	-	-	-	30	-	44
Research	82	820	-	-	-	820	851	-	1,671	15	-	-	-	-	30	-	45
Institute,	83	912	-	-	-	912	859	-	1,771	15	-	-	-	-	30	-	45
Great Lakes, IL	84	1,007	-	-	-	1,007	868	-	1,875	15	-	-	-	-	30	-	45
Naval Explosive	81	5,694	1,720	-	5,693	13,107	693	95	13,895	100	-	75	-	-	30	4	209
Ordnance	82	6,383	-	-	5,203	11,586	804	113	12,503	112	-	60	-	-	40	8	220
Disposal	83	7,021	-	-	4,942	11,963	884	124	12,971	114	-	51	-	-	42	8	215
Facility, Indian Head, MD	84	8,499	-	-	5,189	13,688	972	136	14,796	114	-	51	-	-	42	8	215
Naval Health	81	2,443	142	-	-	2,585	596	-	3,181	54	-	3	-	-	26	-	83
Research	82	2,564	-	-	-	2,564	749	-	3,313	59	-	3	-	-	26	-	88
Center, San Diego, CA	83	2,851	-	-	-	2,851	756	-	3,607	59	-	3	-	-	26	-	88
	84	3,140	-	-	-	3,140	764	-	3,904	59	-	3	-	-	26	-	88
Naval Medical	81	13,424	42	5	1,004	14,475	5,017	-	19,492	190	-	2	-	-	208	-	400
Research	82	12,955	-	-	268	13,223	6,963	-	20,186	187	-	2	-	-	251	-	440
Institute	83	14,408	-	-	282	14,690	7,032	-	21,722	187	-	2	-	-	251	-	440
Bethesda, MD	84	17,052	-	-	-	17,052	7,102	-	24,154	187	-	2	-	-	251	-	440
Naval Medical	81	1,167	-	-	-	1,167	468	-	1,635	32	-	-	-	-	12	-	44
Research Unit	82	1,765	-	-	-	1,765	945	-	2,710	50	-	-	-	-	21	-	71
#2, Manila,	83	1,963	-	-	-	1,963	954	-	2,917	50	-	-	-	-	21	-	71
Phillipines	84	2,219	-	-	-	2,219	964	-	3,183	50	-	-	-	-	21	-	71

a/ Excludes Military Personnel and Military Construction

INSTALLATION ANALYSIS - IN-HOUSE

		TOA (\$ in Thousands)								PERSONNEL (WORK-YEARS)								
Installation and Location	FY	RDT&E Funds			All Other Funds ^{a/}	Subtotal	Mil Pers		Total	Civil Service			Contractor		Mil Pers			
		Mgmt Bureau	Other Navy	Other DOD			RDT&EN	Other		Paid From RDT&EN	Paid From RDT&E	Paid From Other	Paid From RDT&EN	Paid From Other	In RDT&EN Work	Other	Total	
Naval Medical	81	1,975	-	-	-	1,975	710	-	2,685	193	-	1	-	-	26	-	220	
Research Unit	82	2,042	-	-	-	2,042	974	-	3,016	203	-	-	-	-	31	-	234	
#3, Cairo,	83	2,271	-	-	-	2,271	983	-	3,254	203	-	-	-	-	31	-	234	
Egypt	84	2,542	-	-	-	2,542	992	-	3,534	203	-	-	-	-	31	-	234	
Naval Ocean	81	24,308	4,180	6,724	1,750	36,962	344	-	37,306	217	39	8	-	-	9	-	273	
Research and	82	23,777	4,830	7,786	2,020	38,413	365	-	38,778	242	43	9	-	-	11	-	305	
Development	83	26,943	5,029	8,107	2,103	42,182	603	-	42,785	256	46	10	-	-	16	-	328	
Activity, Bay	84	35,235	5,472	8,821	2,288	51,816	603	-	52,419	256	46	10	-	-	16	-	328	
St. Louis, MS																		
Naval Ordnance	81	3,374	2,131	430	1,186	7,121	823	113	8,057	40	5	10	19	1	51	7	133	
Missile Test	82	5,662	1,144	381	1,856	9,043	723	99	9,865	40	5	10	19	1	51	7	133	
Facility,	83	5,678	1,258	419	2,042	9,397	796	109	10,302	40	5	10	19	1	51	7	133	
White Sands, NM	84	6,246	1,384	461	2,246	10,337	849	116	11,302	40	5	10	19	1	51	7	133	
Navy Personnel	81	17,706	389	579	3,252	21,926	704	-	22,630	236	12	42	9	-	29	-	328	
Research and	82	15,263	1,657	500	3,345	20,765	932	-	21,697	208	26	55	10	-	34	-	333	
Development	83	17,368	1,357	100	3,060	21,885	1,037	-	22,922	229	19	48	10	-	35	-	341	
Center,	84	18,410	1,438	106	3,244	23,198	1,037	-	24,235	229	19	48	10	-	45	-	351	
San Diego, CA																		
Naval	81	2,267	39	-	-	2,306	800	-	3,106	53	-	1	-	-	30	-	84	
Submarine	82	1,856	-	-	-	1,856	954	-	2,810	55	-	1	-	-	30	-	86	
Medical	83	2,064	-	-	-	2,064	963	-	3,027	55	-	1	-	-	30	-	86	
Research	84	2,294	-	-	-	2,294	973	-	3,267	55	-	1	-	-	30	-	86	
Laboratory, Groton, CT																		

^{a/} Excludes Military Personnel and Military Construction

INSTALLATION ANALYSIS - IN-HOUSE

Installation and Location	FY	TOA (\$ in Thousands)								PERSONNEL (WORK-YEARS)								
		RD&E Funds			All Other Funds ^{a/}	Subtotal	Mil Pers		Total	Civil Service			Contractor		Mil Pers In RD&EN	Work	Other	Total
		Mgmt	Other	Other						Paid From	Paid From	Paid From	Paid From	Paid From				
		Bureau	Navy	DOD			RD&EN	Other		RD&EN	RD&E	Other	RD&EN	Other				
Naval Weapons	81	2,041	500	20	4,500	7,061	2,565	-	9,626	27	1	73	3	-	125	-	-	229
Evaluation	82	2,847	650	20	4,600	8,117	3,201	-	11,318	30	1	73	13	-	125	-	-	242
Facility	83	3,773	650	20	4,800	9,243	3,360	-	12,603	30	1	73	13	-	125	-	-	242
Albuquerque, NM	84	3,371	650	20	4,800	8,841	3,528	-	12,369	30	1	73	13	-	125	-	-	242
Navy Clothing	81	1,170	695	126	1,337	3,328	41	-	3,369	26	-	27	-	-	1	-	-	54
and Textile	82	1,082	1,232	-	1,252	3,566	45	-	3,611	28	-	27	-	-	1	-	-	56
Research Unit	83	1,141	1,100	-	1,320	3,561	45	-	3,606	28	-	27	-	-	1	-	-	56
Natick, MA	84	1,187	1,000	-	1,367	3,554	45	-	3,599	28	-	27	-	-	1	-	-	56
Navy Space	81	615	73	-	404	1,092	490	-	1,582	14	-	11	-	-	16	-	-	41
Systems	82	756	157	-	342	1,255	539	-	1,794	14	-	11	-	-	16	-	-	41
Activity,	83	1,013	157	-	343	1,513	593	-	2,106	14	-	11	-	-	16	-	-	41
Los Angeles, CA	84	1,214	160	-	350	1,724	652	-	2,376	14	-	11	-	-	16	-	-	41
Subtotal, Navy	81	98,528	11,992	7,954	23,670	142,144	23,300	208	165,652	1,383	57	266	213	12	1,007	11	-	2,949
Non-NIF	82	98,847	11,449	8,818	21,559	140,673	29,138	212	170,023	1,434	75	264	169	1	1,098	15	-	3,056
Installations	83	110,413	11,381	8,787	21,453	152,034	30,015	233	182,282	1,471	71	249	169	1	1,106	15	-	3,082
	84	127,459	12,040	9,562	22,235	171,296	30,561	252	202,109	1,471	71	249	169	1	1,116	15	-	3,092
TOTAL,	81	1,527,189	201,647	181,619	981,429	2,891,884	95,259	1,128	2,988,271	21,590	2,112	8,187	2,005	1,348	5,006	51	-	40,299
IN-HOUSE	82	1,690,721	219,905	184,197	950,612	3,045,435	109,955	1,152	3,156,542	21,404	1,939	7,674	2,194	1,621	5,130	55	-	40,017
	83	1,781,183	225,724	182,477	976,951	3,166,335	117,641	1,198	3,285,174	21,870	1,793	7,456	2,737	1,870	5,043	55	-	40,824
	84	1,877,315	251,627	195,866	1,036,852	3,361,660	123,026	1,232	3,485,918	21,870	1,793	7,456	2,756	2,012	5,093	55	-	41,035

^{a/} Excludes Military Personnel and Military Construction

RESEARCH, DEVELOPMENT, TEST AND EVALUATION, NAVY
INSTALLATION ANALYSIS - FCRCs

		TOA (\$ in Thousands)				PERSONNEL (WORK YEARS)*									
		RD&E Funds		All Other	Subtotal	Mil. Pers.	Total	Professional			Support			Mil. Pers. ASSIGNED**	TOTAL
FCRC & Location	FY	Navy	DOD	Funds				Paid From	Paid From	Paid From	Paid From	Paid From	Paid From		
								RD&EN	RD&E	OTHER	RD&E	RD&E	OTHER		
Center for Naval	81	15,287	-0-	-0-	15,287	1,315	16,602	171	-0-	-0-	156	-0-	-0-	58	385
Analyses	82	16,535	-0-	-0-	16,535	1,499	18,034	171	-0-	-0-	156	-0-	-0-	58	385
University of	83	18,871	-0-	-0-	18,871	1,499	20,370	171	-0-	-0-	156	-0-	-0-	58	385
Rochester, NY	84	20,807	-0-	-0-	20,807	1,499	22,306	171	-0-	-0-	156	-0-	-0-	58	385

* Total work-years of effort (Includes management consultants and part-time personnel)

** FY 81-84 figures indicate military allowance

DEPARTMENT OF DEFENSE, MILITARY
PDT&E, NAVY
ANALYSIS OF REIMBURSABLE PROGRAM
(\$ in thousands)

<u>Customer</u>	<u>FY 1981 Actual</u>	<u>FY 1982 Estimate</u>	<u>FY 1983 Estimate</u>
Department of the Navy	125,843	152,620	152,220
<u>Other Department of Defense Components</u>			
Department of the Air Force	641	570	630
Department of the Army	1,838	1,070	1,170
Other Department of Defense Components	270	410	440
<u>Activities Outside Department of Defense</u>			
National Aeronautics and Space Administration	1,905	2,650	2,840
Department of Transportation	193	210	210
Department of Health and Human Services	1,820	1,670	1,680
Department of Energy	343	—	—
National Oceanographic and Atmospheric Administration	346	400	400
Department of Interior	2,616	—	—
National Science Foundation	220	230	230
Other	300	170	180
Total	<u>136,344</u>	<u>160,000</u>	<u>160,000</u>

The major portion of the RDT&F reimbursable program reflects intra-Navy orders received at Navy RDT&E activities for work and services. Reimbursable orders are also received for work and services for other bureaus of the government, such as:

- a. Support provided to the Air Force and NASA by the Naval Ordnance Missile Test Facility, White Sands, NM.
- b. Support provided to the Army by the Naval Explosive Ordnance Disposal Facility, Indian Head, MD.
- c. Support provided to the Department of Health and Human Services in the areas of cancer research and infectious diseases.

DEPARTMENT OF DEFENSE, MILITARY
RDT&E NAVY
FEDERAL CONTRACT RESEARCH CENTERS
DESCRIPTION AND JUSTIFICATION

General: Federal Contract Research Centers (FCRCs) are those organizations sponsored by the Department of Defense and primarily engaged in providing independent specialized technical and scientific effort necessary to supplement that available in the Navy.

Center for Naval Analyses, University of Rochester, Rochester, New York: The FY 1982 funding program at this FCRC is based upon a planned civilian manpower level of 327. The planned FY 1983 program of \$18,871,000 does not provide for an increase in personnel over FY 1982. Furthermore, the FY 1984 authorization request of \$20,807,000 does not provide for a personnel increase over the FY 1982 level. This Center manages and conducts a continuing program of scientific projects concerning development of doctrine, tactics, techniques, weapons systems, forces and equipment required for all aspects of Naval warfare and Marine Corps operations, including amphibious operations. Assistance is given to the operating forces by means of operational analyses to help improve current force capabilities and provide operational data bases for other studies and analyses.

The Center for Naval Analyses (CNA) was established in 1962 as a private scientific organization to provide continuing research assistance to the Department of the Navy. The research program provides an independent base to assist the Navy in formulation of policies and programs concerned with the development, application, and improvement of naval capabilities.

The Navy has found a continuing need for the work of the CNA. The Navy needs a group familiar enough with its operations and naval problems to do relevant work, but independent enough to address controversial issues objectively and present unpopular views effectively. CNA operations are carefully monitored to ensure that the work is relevant and applied to naval problems and that the operation efficiently uses government funds. Navy officer analysts are assigned to CNA to bring operational judgement and experience to the work. The field program whereby CNA analysts serve on ships and in other operating commands has been a continuing feature of the Navy Program.

CNA has historically kept close ties with its Navy Sponsor and has contributed work on central issues. With access to Navy decision-makers and the confidence of the Chief of Naval Operations and fleet commanders, a unique relationship of mutual trust has developed. As a result, CNA's work is focused on major Navy problems. A variety of management and procedural practices ensure that Navy leaders play an active role in the analytical program of CNA and that this program is responsive to Navy needs without undermining CNA's responsibility to produce independent and high quality work. CNA is also unique in that it works with all levels of its sponsor. Support is provided to fleet activities, unit commanders, type commanders, and the Chief of Naval Operations and his staff. This results in more realistic and informed analyses at all levels and provides for cross-fertilization of ideas between the fleet and research projects. Military personnel who are assigned to CNA also contribute to more realistic projects as operational factors are given due consideration. CNA's efforts are almost fully focused on naval and national defense problems; yet its direct affiliation with a university provides an external review.

FEDERAL CONTRACT RESEARCH CENTERS
DESCRIPTION AND JUSTIFICATION

ation: The planned funding at Aerospace in FY 1983 is \$5,820,000. It will provide for technical assistance in ing, and evaluating the Navy's exploratory development programs including launch vehicle materials and reentry ical direction and general engineering support to the Air Force in the acquisition of spacecraft for the Fleet nications Program; investigation of the modification and control of properties of materials containing fibers; laser research involving investigation of chemical reaction process for high power and pulse chemical inuation of work on ocean surveillance and targeting systems.

on: The planned funding for MITRE in FY 1983 is \$9,930,000. It will provide for continuing technical support to -to-ship submarine communications program and tactical command and communications systems engineering including Navy combination radio program with the other services, the Joint Tactical Information Distribution System, the Friend or Foe (IFF) Mark XII, and the Navy's secure voice program; for continued work on the Navy's C² Planning/ ring Support; for test and evaluation support; for range instrumentation and systems development, including involving air combat maneuvering and an integrated air warfare training complex and for ADP security, Counter C³ are Master Plan, LANTCOM Modernization Plan, Electromagnetic Communications and various efforts in the C³ Arena.

ories, Massachusetts Institute of Technology: The planned funding at Lincoln Laboratory in FY 1983 is will provide for continuous development support in the area of Advanced Satellite communications as well as ort in High Energy Laser/Electro-Optic Technology, and Radar Surveillance.

FEDERAL CONTRACT RESEARCH CENTERS
Summary By Appropriation and Element
(\$ in Thousands)

	<u>FY 1981</u> <u>Actual</u>	<u>FY 1982</u> <u>Estimate</u>	<u>FY 1983</u> <u>Estimate</u>	<u>FY 1984</u> <u>Estimate</u>
<u>Center for Naval Analyses, University of Rochester</u>				
<u>Research, Development, Test and Evaluation, Navy Appropriation</u>				
63514N Shipboard Damage Control	50	--	--	--
63703N Anti-Submarine Warfare Signal Processing	98	--	--	--
65153M Marine Corps Operations Analysis Group (MCOAG)	2,018	2,481	2,754	2,877
65154N Center for Naval Analyses, Navy	10,333	11,351	12,445	13,381
65155N Fleet Tactical Development and Evaluation	2,483	2,508	3,205	3,526
65853N Management and Technology Support	120	--	--	--
TBD Effects of Compensation on Enlisted Retention	185	--	--	--
Programs to be Determined	--	195	467	1,023
Total, Research, Development, Test and Evaluation, Navy Appropriation	15,287	16,535	18,871	20,807
TOTAL, Center for Naval Analyses, University of Rochester	15,287	16,535	18,871	20,807

Aerospace Corporation

<u>Research, Development, Test and Evaluation, Navy Appropriation</u>				
61153N Physical Properties of Carbon/Graphite Fibers	185	125	170	170
62241N SATRAD	125	255	900	960
62735N High Energy Laser Technology	195	300	300	300
62761N Materials Technology	650	650	600	550
62762N Electronics Device Technology	95	100	100	50
63763N Integrated Ocean Surveillance and Targeting System (ITSS)	120	150	250	370
Total, Research, Development, Test, and Evaluation, Navy Appropriation	1,370	1,580	2,320	2,400

FEDERAL CONTRACT RESEARCH CENTERS
Summary By Appropriation and Element
(\$ in Thousands)

	<u>FY 1981</u> <u>Actual</u>	<u>FY 1982</u> <u>Estimate</u>	<u>FY 1983</u> <u>Estimate</u>	<u>FY 1984</u> <u>Estimate</u>
<u>Aerospace Corporation</u>				
<u>Operations and Maintenance, Navy Appropriation</u>				
33109N FLTSATCOM	--	900	600	700
<u>Weapons Procurement, Navy Appropriation</u>				
33109N FLTSATCOM	2,050	585	2,900	3,200
TOTAL, Aerospace Corporation	3,420	3,065	5,820	6,300
<u>MITRE Corporation</u>				
<u>Research, Development, Test and Evaluation, Navy Appropriation</u>				
11401N ELF Communications	--	--	442	605
11402N Navy Strategic Communications	878	865	1,222	1,320
24161N TACTS/ACMI Utilization Study	94	95	--	--
24163N Fleet Telecommunications	379	700	1,390	780
25604N Joint Tactical Information Distribution System (JTIDS)	222	200	333	600
62712N Radar Imaging	91	--	--	--
62721N Electromagnetic Communications	130	150	162	120
62721N Artificial Intelligence	50	--	--	--
63589N DDGX	77	200	222	840
63712N Operational Readiness Monitoring System	91	200	--	--
63717N Command and Control Systems	60	--	--	573
63763N Integrated Tactical Surveillance System (ITSS)	--	200	--	--
64208N Range Instrumentation and Systems Development	81	90	108	120
64211N IFF Mark XII	374	400	499	540
64510N Secure Voice Graphics Conferencing	192	--	--	--
64574N ADP Security	187	200	444	480

FEDERAL CONTRACT RESEARCH CENTERS
Summary By Appropriation and Element
(\$ in Thousands)

	<u>FY 1981</u> <u>Actual</u>	<u>FY 1982</u> <u>Estimate</u>	<u>FY 1983</u> <u>Estimate</u>	<u>FY 1984</u> <u>Estimate</u>
<u>MITRE Corporation</u>				
64701N Prototype Carrier Operational Test and Evaluation Site	196	--	--	--
64711N Command and Control System	--	200	222	240
64777N NAVSTAR GPS	--	--	222	240
64779N Joint Interoperability of Tactical Command and Control System (JINTACCS)	289	--	--	--
65803N Electromagnetic Spectrum Management	--	200	222	240
65858N Command and Control Architectural Management and Support	47	--	--	--
65859N Mobile Sea Range	100	95	222	260
65864N Test and Evaluation Support	94	100	100	50
65866N C ² Systems Planning/Engineering	1,229	1,520	1,732	2,172
TBD C ³ Countermeasures	15	--	334	480
Programs to be Determined	--	200	222	240
Total, Research, Development, Test and Evaluation, Navy Appropriation	4,876	5,615	8,098	9,900
<u>Operations and Maintenance, Navy Appropriation</u>				
31331N LANTCOM IDHS Modernization	305	320	389	420
31355N Verification and Validation (IAIPS)	--	570	667	720
78012N Command Systems Engineering Group	819	670	776	960
Total, Operations and Maintenance, Navy Appropriation	1,124	1,560	1,832	2,100
TOTAL, MITRE Corporation	6,000	7,175	9,930	12,000

FEDERAL CONTRACT RESEARCH CENTERS
Summary By Appropriation and Element
(\$ in Thousands)

	<u>FY 1981</u> <u>Actual</u>	<u>FY 1982</u> <u>Estimate</u>	<u>FY 1983</u> <u>Estimate</u>	<u>FY 1984</u> <u>Estimate</u>
<u>Lincoln Laboratories, Massachusetts Institute of Technology</u>				
<u>Research, Development, Test and Evaluation, Navy Appropriation</u>				
24163N Near Term Anti-Jam Communications	30	--	--	--
61101E High Speed Modulation of GaInAsP	200	100	180	200
62543N Navy Measurements	--	150	200	220
62712N Radar Surveillance Technology	510	920	1,320	1,530
62735N High Energy Laser Technology	2,131	2,012	2,500	2,700
62762N Electronics Device Technology	174	--	400	445
64577N FLTSATCOM	320	600	350	350
TBD AAW Technology	270	600	1,650	2,400
TBD Quaternary APD	--	50	50	60
----- Classified Program	--	4,440	5,150	5,295
 Total, Research, Development, Test and Evaluation, Navy Appropriation	 3,635	 8,872	 11,800	 13,200
 TOTAL, Lincoln Laboratories, Massachusetts Institute of Technology	 3,635	 8,872	 11,800	 13,200
<u>GRAND TOTAL BY APPROPRIATION</u>				
Research, Development, Test and Evaluation, Navy Appropriation	25,168	32,602	41,089	46,307
Operations and Maintenance, Navy Appropriation	1,124	2,460	2,432	2,800
Weapons Procurement, Navy Appropriation	2,050	585	2,900	3,200
Subtotal, Navy Appropriation	28,342	35,647	46,421	52,307
Operations and Maintenance (CINCPAC-MITRE)*	1,360	1,550	1,796	1,920
 TOTAL, Federal Contract Research Centers	 29,702	 37,197	 48,217	 54,227

* This amount carried under the Navy ceiling in order to reflect the overall DOD amount.

MAJOR IMPROVEMENTS TO AND CONSTRUCTION OF GOVERNMENT-OWNED FACILITIES FUNDED BY RDT&E

This exhibit reflects financing for planned construction projects under the Navy's RDT&E,N appropriation including improvement to facilities at government-owned/government-operated installations, and minor construction projects at in-house installations.

The data provided by this exhibit includes the following:

Project Listing

Part I and Part II, Section I reflects projects accomplished or underway and Section II reflects projects planned or projected.

Narrative Statements

A supporting narrative statement is provided for each equipment installation project budgeted in FY 1983 with an estimated equipment and installation cost in excess of \$400,000.

Project Data Sheets (DD-1391)

These data sheets are provided for all projects budgeted in FY 1983 and any item being included in the budget for the first time (FY 1981 through FY 1983).

Minor Construction

Summary of Minor Construction funded by the RDT&E,N Appropriation.

DEPARTMENT OF DEFENSE, MILITARY
RDT&E, NAVY
MAJOR IMPROVEMENTS TO AND CONSTRUCTION OF GOVERNMENT-OWNED FACILITIES FUNDED BY RDT&E

PART I. UTILIZATION OF SECTION 2353, TITLE 10 AUTHORITY

Specialized R&D facilities and/or equipment determined to be necessary for the performance of a contract for a Military Department for research and development may be constructed by or furnished to the contractor and funded from appropriations available for research, development, test and evaluation. The Congress enacted this legislation, now 10 USC 2353, in 1956. This policy is executed through DOD Directive 4275.5. Under this policy, the Secretaries of the Military Departments or their designees, and the Directors of Defense Agencies may approve facilities projects up to \$3,000,000; the Under Secretary of Defense Research and Engineering approves projects exceeding \$3,000,000. The Congress is notified in advance of starting any project involving construction, regardless of the dollar amount. The table below provides a summary listing of all such projects accomplished in FY 1981 and planned in FY 1982, FY 1983, and FY 1984.

<u>FACILITY/EQUIPMENT</u>	<u>RDT&E,N Project Number</u>	<u>CONTRACTOR</u>	<u>LOCATION</u>	<u>TOTAL OBLIGATIONAL AUTHORITY</u> <u>(\$ in thousands)</u>			
				<u>FY 1981</u>	<u>FY 1982</u>	<u>FY 1983</u>	<u>FY 1984</u>

SECTION I
PROJECTS ACCOMPLISHED OR UNDERWAY

Civil Works for New Digital Computer and Guidance Laboratory 2/	B0951	Lockheed Missiles and Space Company, Sunnyvale, CA Inc.	NIROP	612	0	0	0
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SECTION II
PROJECTS PLANNED OR PROJECTED

Extremely Low Frequency Communications (ELF COMM) Wisconsin Test Facility Alteration	X0792	General Telephone and Electric (GTE)	Clam Lake, Wisconsin	0	0	4,400	0
Machine Tools and Test Equipment for TRIDENT II Development 2/	B0951	Lockheed Missiles and Space Company, Sunnyvale, CA Inc.	NIROP	0	254	1,982	30,992

FACILITY/EQUIPMENT	RDT&E,N Project Number	CONTRACTOR	LOCATION	TOTAL OBLIGATIONAL AUTHORITY (\$ in thousands)			
				FY 1981	FY 1982	FY 1983	FY 1984
Missile Data Center <u>2/</u>	B0951	Lockheed Missiles and Space Company, Inc.	NIROP Sunnyvale, CA	0	0	0	3,892
Bridge Cranes <u>2/</u>	B0951	Lockheed Missiles and Space Company, Inc.	Santa Cruz Test Complex, Santa Cruz, CA	0	293	0	0
Data Acquisition <u>2/</u>	B0951	Lockheed Missiles and Space Company, Inc.	Cape Canaveral, FL	0	0	26	12,144
Software Development <u>2/</u>	B0951	Interstate Electronics Corp.	Anaheim, CA	0	0	0	5,380
Upgrade Surface Launch Complex to Accommodate TRIDENT II Development <u>2/</u>	B0951	Westinghouse Electric Corp.	Hunters Point Surface Launch Test Complex, San Francisco, CA	0	435	2,241	10,123
Engineering Test System Test Berth Modifications for TRIDENT II Development <u>2/</u>	B0951	General Electric Company, Ordnance Systems	NIROP Pittsfield Pittsfield, MA	0	0	0	1,000
TOTAL, PART I				<u>\$612</u>	<u>\$ 982</u>	<u>\$ 8,649</u>	<u>\$63,531</u>

SUPPORTING NARRATIVE STATEMENT FOR EXTREMELY LOW FREQUENCY (ELF) COMMUNICATIONS WISCONSIN TEST FACILITY

Expanded facilities are needed at the ELF Wisconsin Test Facility (WTF) to validate the performance of the Presidentially approved ELF transmitter system. The WTF was built in 1969 as an RDT&E test bed to verify ELF transmissions and their reception aboard submarines. Subsequent to the validation of the theory and in preparation for an operational system, specific performance goals and transmission system specifications have been established which require replacement or additions to certain segments of the transmitter equipments. In order to verify system operating parameters prior to the production of another unique operating system, the RDT&E test bed must be improved to incorporate all system operating constraints.

In addition to more square footage, primary improvements will be made to provide High-altitude Electromagnetic Pulse (HEMP) protection and Electromagnetic Compatibility (EMC) characteristics to the test facility to allow it to house an expanded equipment suite, including the addition of a HEMP-protected alternate power source (generators) with associated switchgear to support system performance requirements for contingency conditions.

To convert the test site to a reliable operational system the existing transmitter facility will be altered to include the addition of an 8400 square foot backup power building to accommodate four 500 KW generators and provide vehicle storage/maintenance. Existing facilities will receive alterations to include ventilation and HEMP protection and modifications to built-in equipment such as installation of shielded rooms, rearranging switch gear, and installation/routing of alternate generator power lines and connections.

The Wisconsin Test Facility is now providing test signals to prototype receivers using the originally developed 1969 equipment. The 8 October 1981 Presidential decision to develop a second synchronously operated ELF site requires an operational vice RDT&E system; thus the RDT&E configuration needs to be replaced in part and expanded to reflect an operational system. The needed improvements to the WTF are required in order to verify total system performance before fielding a second site. The construction for the second site is to be programmed using MILCON appropriations.

SUPPORTING NARRATIVE STATEMENT FOR MACHINE TOOLS AND TEST EQUIPMENT FOR TRIDENT II DEVELOPMENT

Because of the existing technical expertise and proven performance, Lockheed Missiles and Space Company Incorporated (LMSC) was selected as subsystem prime contractor for design and development of the Missile Subsystem for the TRIDENT II SWS. Functions which must be performed at this facility during the development phase of the program are advanced product development, limited development manufacturing, and associated testing and product assurance as they relate to formulating the various materials, components, and subsystems. The facilities included in this project are those vital to the successful accomplishment of the development program. They are projects which LMSC is unwilling to furnish and for which Navy funds must be provided. Examples of the items to be provided are; Computer Numerically Controlled Machine Tools to accommodate the increased size of the missile, Automatic Test Equipment for test and evaluations of integrated circuit candidates for various new devices, and various civil works items in support of these acquisitions.

The approximate dollar breakdown is:

	<u>FY 82 (K\$)</u>	<u>FY 83 (K\$)</u>	<u>FY 84 (K\$)</u>
Non-severable Facilities Items	254	1,982	3,199
Severable Facilities Items	3,046	16,371	27,793

Many facility items required for previous FBM work are inadequate for TRIDENT II missile development since state of the art technological progress in materials composition and bonding electronics miniaturization, sequencing and control techniques, and other areas important to missile subsystem development require that some additional, and more modern facilities be provided at NIROP Sunnyvale. The design parameters (greater weight, thrust, altitude, range, flight duration, reliability) demand more extensive facilities capability, with wider performance ranges and even greater repeatability in testing and production, than presently exists at the Navy Industrial Reserve Ordnance Plant (NIROP) for proposed hardware item feasibility and function testing. Alternate component manufacturing methods must be examined on a small scale during development for their impact upon hardware function, operating costs, and reliability before design options are only those for which no substitute capabilities exist, or for which the cost or loss of time and/or program control involved in subcontracting far outweighs the Navy facilities investment and LMSC operating costs. The cost of this facility project relative to overall program development cost is relatively small but is essential to the program. The facilities are needed beginning in FY 1982 in order to support the currently baseline development schedule.

SUPPORTING NARRATIVE STATEMENT FOR UPGRADED SURFACE LAUNCH COMPLEX TO ACCOMMODATE TRIDENT II DEVELOPMENT

The Hunters Point Surface Launch Test Complex (HPSLTC) in San Francisco is a Facility that has been developed to accommodate developmental, environmental and reliability testing of components of the Fleet Ballistic Missile (FBM) launching systems. The test complex was part of the Hunters Point Naval Shipyard before it was deactivated in 1974. The test complex area was constructed at the yard in 1945 and used as a regunning facility for Naval Surface Combatants. The regunning pier and other facilities were retained by the Naval Sea Systems Command (NAVSEA) upon deactivation of the yard. In 1957 the Strategic Systems Project Office (SSPO) established the test complex to support POLARIS Missile and launcher development requirements. SSPO has an agreement with NAVSEA for exclusive use of the land and facilities within the test complex. Under this agreement, the maintenance and repair of existing facilities and the construction of new facilities within the test complex is the responsibility of SSPO.

Considering the large expenditure of funds required to retain existing capability at Hunters Point and to construct facilities for TRIDENT II requirements, serious consideration was given to relocating this test effort to another site. However, the already overcrowded conditions at other sites, the explosive safety and environmental impacts, and the cost considerations have resulted on the selection of HPSLTC for launcher systems testing.

The existing technical expertise and proven performance has resulted in the selection of Westinghouse Electric Corporation (WEC) for launch subsystem development. WEC is the operating contractor at HPSLTC, and is the vehicle for capital maintenance and improvement of the test complex.

The complex must be upgraded to meet the needs of TRIDENT II development. A Data Acquisition Systems (DAS), arrestment system, handling systems, a number of operations buildings, a launch pad, and the sky catch system must be modified and in some cases new facilities provided.

All the project items covered by this report are non-severable.

Maximum use of the existing facilities will be exercised. The TRIDENT II Missile, however, will be larger, heavier, and more complex than previous vehicles. More complex testing, monitoring, analysis, manufacturing, and handling equipment will be necessary. The arrestment handling, launch pad, and a number of building requirements are related to increased size. The more complex testing and monitoring make a new DAS and some new building necessary. The current DAS system is a patch work of equipment which has neither the capacity nor reliability to meet the advance missile development requirements. A new building is required to house this system.

MAJOR IMPROVEMENTS TO AND CONSTRUCTION OF GOVERNMENT-OWNED FACILITIES FUNDED BY RDT&E

PART II. UTILIZATION OF RDT&E APPROPRIATION FOR FACILITIES AT GOVERNMENT-OWNED/GOVERNMENT-OPERATED INSTALLATIONS

Chapter 251 of the DOD Budget Guidance Manual (which was approved by the GAO as DOD Instruction 7220.5) provides that RDT&E appropriations may finance the development, design, purchase, and installation (including directly related foundations, shielding, environmental control, weather protection, structural adjustments, utilities and access) of equipment or instrumentation required for research, development, test and evaluation activities. The table below provides a summary listing of all such projects for the installation of equipment, where the cost of installation is \$100,000 or more, accomplished in FY 1981 and planned in FY 1982, FY 1983, and FY 1984.

<u>FACILITY/EQUIPMENT</u>	<u>RDT&E PROJECT NUMBER</u>	<u>LOCATION</u>	<u>TOTAL OBLIGATIONAL AUTHORITY (\$ in thousands)</u>			
			<u>FY 1981</u>	<u>FY 1982</u>	<u>FY 1983</u>	<u>FY 1984</u>
<u>SECTION I</u>						
PROJECTS ACCOMPLISHED OR UNDERWAY						
Shielded Anechoic Chamber Installation and Special Laboratories (MILCON P-080) <u>1/</u>	R0137	Naval Research Laboratory, Washington, DC	1,877	-	-	-
Shielded Anechoic Chamber Installation and Special Laboratories (MILCON P-280) <u>1/</u>	R0137	Naval Research Laboratory, Washington, DC	2,869	3,568	1,860	379
Central Target Simulation Facility Installation <u>1/</u>	R0137	Naval Research Laboratory, Washington, DC	400	755	270	350
Radome Installation for AN/FPS-114 radar (PMTTC) <u>1/</u>	W0653	Pacific Missile Test Center (Santa Cruz Island) Pt Mugu, CA	224	-	-	-

FACILITY/EQUIPMENT	RDT&E PROJECT NUMBER	LOCATION	TOTAL OBLIGATIONAL AUTHORITY (\$ in thousands)			
			FY 1981	FY 1982	FY 1983	FY 1984
Radome Installation for AN/FPS-114 Radar (PMTC) <u>1/</u>	W0653	Pacific Missile Test Center (Laguna Park) Pt Mugu, CA	160	-	-	-
Central Scientific Computer Communications Network <u>1/</u> (NATC)	W0654	Naval Air Test Center Patuxent River, MD	1,800	-	-	-
Central Air Conditioning Cooling System, Hangar 144 (Shielded Hangar) (NATC) <u>2/</u>	W0654	Naval Air Test Center Patuxent River, MD	100	-	-	-
Unabated Engine Test Facility (NATC) <u>2/</u>	W0654	Naval Air Test Center Patuxent River, MD	-	170	-	-
Electric Power Transfer System, SNI (PMTC) <u>2/</u>	W0653	Pacific Missile Test Center Point Mugu, CA	-	130	-	-
Install Vehicle System Integration Facility <u>1/</u>	W0597	Naval Air Development Center, Warminster, PA	121	-	-	-
Install Mass Storage System <u>1/</u>	Z0833	David W. Taylor Naval Ship R&D Center, Bethesda, MD	222	-	-	-
Install Linear Accelerator <u>1/</u>	Z0833	Naval Air Development Center, Warminster, PA	148	300	-	-
Install 50 Gallon Propellant Batch Mixer <u>1/</u>	Z0833	Naval Weapons Center, China Lake, CA	-	392	-	-
Non-Acoustics Laboratory <u>2/</u>	S1125	Naval Underwater Systems Center, Newport, RI	125	-	-	-
Integrated Target Facility <u>2/</u>	S1265 S0199	Naval Underwater Systems Center, Newport, RI	950	-	-	-

FACILITY/EQUIPMENT	RDT&E PROJECT NUMBER	LOCATION	TOTAL OBLIGATIONAL AUTHORITY (\$ in thousands)			
			FY 1981	FY 1982	FY 1983	FY 1984
TRIDENT Submarine Land Based Evaluation Facility <u>1/</u>	B0004	Naval Underwater Systems Center, Newport, RI	310	335	365	400

SECTION II

PROJECTS PLANNED OR PROJECTED

Wells Air Start System (NWC) <u>2/</u>	W0657	Naval Weapons Center China Lake, CA	-	-	100	-
Hydroshaker Installation (NWC) <u>1/</u>	W0657	Naval Weapons Center China Lake, CA	-	-	150	-
Refrigeration System for Cruise Missile (NAPC) <u>1/</u>	W0655	Naval Air Propulsion Center Trenton, NJ	-	-	292	-
Centralized 400 HZ Power Chesapeake Test Range (NATC) <u>1/</u>	W0654	Naval Air Test Center Patuxent River, MD	-	-	-	150
P-3 Facility Installation <u>1/</u>	W1149	Naval Air Development Center, Warminster, PA	-	797	-	-
Install Ocean Surveillance <u>1/</u> Equipment	Z0833	Naval Ocean Systems Center, San Diego, CA	-	250	-	-
Install Interactive Graphics <u>2/</u> System	Z0833	Naval Ocean Systems Center, San Diego, CA	-	150	-	-
Install CDC 6000 Computer <u>2/</u>	Z0833	David W. Taylor Naval Ship R&D Center, Bethesda, MD	-	152	-	-

<u>PROJECT</u>	<u>PROJECT NUMBER</u>	<u>LOCATION</u>	TOTAL OBLIGATIONAL AUTHORITY (\$ in thousands)			
			<u>FY 1981</u>	<u>FY 1982</u>	<u>FY 1983</u>	<u>FY 1984</u>
Computer Aided 2/ Drafting (CADD)	Z0833	Naval Surface Weapons Center, Dahlgren, VA	-	275	-	-
al Computer 2/ s 107 & 1176	Z0833	Naval Underwater Systems Center, Newport, RI	-	250	-	-
al Computer 2/ 80 (NL)	Z0833	Naval Underwater Systems Center, New London, CT	-	205	-	-
egrated Test 2/) Sonar Control	Z0833	Naval Underwater Systems Center, New London, CT	-	200	-	-
voltaic, Bermuda 2/	Z0833	Naval Underwater Systems Center, Tudor Hill Lab, Bermuda	-	200	-	-
I			<u>9,306</u>	<u>8,129</u>	<u>3,037</u>	<u>1,279</u>

by (2) DD 1391's (\$158 and \$117)

listed in RDT&E Justification of Estimates for FY 1982
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SUPPORTING NARRATIVE STATEMENT ON INSTALLATIONS AND TECHNICAL COLLATERAL FOR SPECIAL LABORATORIES, P-280 CHAMBER

Two chambers are to be installed:

- Wideband Measurements Shielded Anechoic Chamber (WMSAC)
- Air Frame Shielded Anechoic Test Chamber (AFSATC)

Each chamber has an associated control room and computer area, with dedicated instrumentation. The seventeen (17) special collateral technical laboratory facilities are being equipped with dedicated equipments and special components to permit each to be used independently or simultaneously peripherally or interdependently with the P-280 chambers as well as those in the second phase, P-080, or the large phase one Central Target Simulator (CTS). These seventeen (17) special laboratories are identified by the following descriptive titles:

- Airborne Decoy Laboratory Equipments
- Airborne Reconnaissance Laboratory Equipments
- Airborne Intercept Laboratory Equipments
- High Bay Systems Engineering
- High Bay/System Integration Equipments
- Airborne Antenna Laboratory Equipments
- Interface Simulation Instrumentation
- Special Projects - Laboratory Equipments
- Flight Simulation Instrumentation
- Airborne Jammer Laboratory Equipments
- Airborne Warning Laboratory Equipments
- High Power Radio Frequency (RF) Instruments
- Environmental Laboratory Interface Equipments
- Central Control/Display System
- Hybrid Laboratory Instrumentation
- High Power Vacuum Test System
- Laboratory Wide Tunnel and Equipments

The P-280 chamber installations and special laboratory equipments require additions and/or modifications in the building structures and utilities (heating, ventilating, mechanical and electrical).

	<u>Non-Severable*</u>	<u>Severable</u>
WMSAC(AIR)	2425	710
AFSATC	1722	540
In-House Design/Management	1192	-
Technical collateral for special laboratories	3072	3900
	<u>8411</u>	<u>5150</u>

*includes designs, interfaces, and interconnections.

The Naval Research Laboratory (NRL) conducts a multi-disciplined program of scientific research and development directed toward new and improved materials, equipment, techniques, and systems for the Navy. The Tactical Electronic Warfare Division (TEWD) of the Naval Research Laboratory is responsible for research and development in support of the Navy's tactical electronic warfare requirements and missions. These include electronic warfare support measures, electronic countermeasures, supporting counter-countermeasures, as well as study, analyses, and simulations for the determination and improvement of the effectiveness of these systems. Special functional facilities are required to advance the development and evaluation of shipboard electronic warfare systems through wider application of simulation techniques representing realistic tactical events under controlled laboratory conditions. This project provides chambers in P-080 and P-280 essential to providing funded programs the facilities needed for an integrated facility for sea research in electromagnetic signal intercept and the effective development of electronic countermeasure in support of fleet electronic warfare systems.

In support of the research and development the basic building chamber installations require additional technical collateral instrumented laboratories to assure interfaces with actual military equipments and systems being tested for developmental purposes.

NRL's TEWD has a funded program of over \$35M annually. Among its sponsors are: Naval Material Command (NAVMAT), the Naval Systems Commands and their program management offices, Office of Naval Research (ONR), Naval Intelligence Support Center (NISC), National Security Agency (NSA), and other Department of Defense (DoD) organizations; funds are obtained in categories 6.1, 6.2, 6.3, 6.4, and 6.5, as well as Other Procurement, Navy (OPN) and Operations and Maintenance, Navy (O&MN). Funds are exchanged with other Navy and DoD laboratories to achieve a well integrated RDT&E program, for which these facilities are being constructed and installed. Three broad goals set the schedules: (1) P-080 facilities to support the Ships Design-to-Price Electronic Ware (EW) equipment developments, (2) P-280 facilities to support the Air EW Advanced Self-Protection Jammer (ASPJ) program developments, and (3) the completion of of Military Construction, Navy (MCON) P-280 and Central Target Simulator (CTS) Projects. The overall program is one of expanding facilities to advance both SHIP and AIR development capabilities as rapidly as possible.

SUPPORTING NARRATIVE STATEMENT FOR CENTRAL TARGET SIMULATION (CTS) FACILITY

The Tactical Electronic Warfare Division (TEWD) of the Naval Research Laboratory (NRL) is involved in a major effort which provides for the Navy a state-of-the-art Central Target Simulation (CTS) facility. CTS is located in NRL's INTEGRATED ELECTROMAGNETIC TEST AND ANALYSIS LABORATORY (Building 210B). The overall purpose of this facility is to provide for the development, test and evaluation of Electronic Warfare (EW) systems and techniques for countering the missile threat to the Navy by hardware and software real-time simulations in the electromagnetic domain. The CTS is capable of simulating in real-time air and/or sea tactical engagements featuring EW actions and analyzing the results of these simulations. The design of the CTS facility gives the Navy a unique capability to rapidly improve and develop tactical EW technology and systems at minimum cost. The capabilities include:

- Dynamic closed-loop missile seeker and guidance simulation/active radar missile guidance
- True missile motion (in response to Radio Frequency (RF) target generation) via a high performance three-axis flight table
- Evaluation of missile responses in the presence of multiple returns (targets, active Electronic Counter Measures (ECM), chaff)
- Integration and subsequent evaluation of anti-missile EW systems and techniques
- Cooperative countermeasures technique evaluation (combination on-board/off-board ECM)

A laboratory simulation facility featuring "hardware-in-the-loop" is required to advance the development and evaluation of shipboard and airborne electronic warfare systems. This facility makes wide application of simulation techniques (i.e., modeling, replication) specifically designed to represent realistic natural and physical environmental effects. The CTS project provides an integrated facility for research in electromagnetic signal intercept and continued development of electronic countermeasures in support of fleet EW systems.

NRL's Tactical Electronic Warfare Division (TEWD) has a funded program of over \$40M annually. Among its sponsors are: Naval Material Command (NAVMAT), the Naval Systems Commands and their program management offices, Office of Naval Research (ONR), Naval Intelligence Support Center (NISC), National Security Agency (NSA), and other Department of Defense (DOD) organizations; funds are obtained in categories 6.1 through 6.5, as well as Other Procurement, Navy (OPN), and Operations and Maintenance, Navy (O&MN). Funds are exchanged with other Navy and DOD laboratories to ensure a well integrated RDT&E program. The continued development of the CTS facility will enhance the capability of this total EW program. The facility is currently in operation and efforts are directed at improving the current operating modes. Some examples of EW R&D efforts which are being included in the facility planning and operations include:

- Advanced Missile Seeker Countermeasures
- Airborne Cooperative Countermeasures
- Onboard/Offboard Countermeasures for Ships EW
- Electronic Support Measures (ESM) Receiver System Test and Evaluation (T&E)

The overall Central Target Simulator (CTS) facility is one of continual expansion of its resources to support SHIPS Electronic Warfare (EW), AIR EW, and MISSILE Electronic Counter Countermeasures (ECCM) development capabilities as quickly and as economically as possible throughout the EW community.

The various elements which make up the CTS can be described in terms of the five functional subsystems shown in Table 1. Dollar values represent the total subsystem expenditures beginning in FY-78.

Table 1. Five Major Elements of Central Target Simulator (CTS)

<u>Subsystem</u>	<u>Purpose</u>	Dollar Value (\$000)	
		<u>Severable</u>	<u>Non-Severable</u>
Shielded Anechoic Chamber (SAC)	Free Space Radio Frequency (RF) Environment	\$ ---	\$ 500
Target/Source "A" (T/S "A")	Dynamic Motion Simulation	355	
Target/Source "B" (T/S "B")	Radio Frequency (RF) Generation	1,300	6,122
Dedicated Processors/Controller	Real-Time Computations and Control	2,702	179
Background Processors	System Control and Data Analysis	<u>746</u>	<u>80</u>
TOTAL		\$5,103	\$6,881

Supporting Narrative Statement for TRIDENT Submarine Land Based Evaluation Facility (LBEF)

Development studies are currently on-going to identify/design an LBEF support system with a higher degree of commonality between Command and Control System (CCS) tactical and system level trainer simulation and stimulation equipments. Alternatives identified will require replacement of overage equipments currently in the support system with the inherent modifications to equipment foundations, environmental control, cable runs, etc. Completion of these development studies are scheduled for FY 1982 with equipment procurement and installation in FY 1982 and installation in FY 1983. Equipments identified for installation:

Hewlett Packard PDP 11/34
Simulation Signal Data Converter
EMLAC Computer

IBM Automatic Disk File
IBM 1840 Tape Drive

SUPPORTING NARRATIVE STATEMENT FOR INSTALLATION OF CRUISE MISSILE REFRIGERATION SYSTEM

The Naval Air Propulsion Center is the principal Navy Research, Development, Test and Evaluation Center to provide technical and engineering support for air breathing propulsion systems including their accessories and components and fuels/lubricants.

The Naval Air Propulsion Center has been tasked by the Joint Cruise Missile Project Office, Department of Defense, to assume an expanded role in support of the development and production assurance testing of the F-107 family of cruise missile engines and their derivatives, in the Small Engine Test Area (SETA). With increases in the testing of other high priority engine programs there will be heavy operating demands on the existing three refrigeration systems. The fourth refrigeration system will provide the center with the additional capacity needed to retain its SETA and other multicell test capability, and enable it to support cruise missile testing on a noninterference basis.

The test facilities include ram air blowers, exhausters, gas cooler and refrigeration systems. This equipment is used to provide inlet flow, mach number and altitude simulation for engines under test. The fourth refrigeration system will provide additional air and fuel conditioning capacity to support the increased testing workload expected through FY-89 and provide backup to the three 25 year old systems that have been experiencing frequent and protracted downtimes. This project installs approximately \$3.7M of refrigeration system equipment.

The primary objectives of this program will be to:

- Develop cruise missile engines during full-scale development.
- Perform Qualification Tests
- Do follow-on test and evaluation
- Perform production assurance tests
- Allow on-site program monitoring
- Perform the effectiveness verification improvement program
- Allow Navy/Air Force coordination as directed by the Joint Cruise Missiles Project Office and the Joint Engine Project Office
- Develop altitude performance calibrations

MAJOR IMPROVEMENTS TO AND CONSTRUCTION OF GOVERNMENT-OWNED FACILITIES FUNDED BY RDT&E

PART III. UTILIZATION OF RDT&E APPROPRIATION FOR MINOR CONSTRUCTION

For in-house installations, construction projects in support of R&D for \$100,000 or less are funded from the RDT&E appropriation. Such expenditures are authorized by 10 USC 2674 and the applicable provisions of the current OOD Appropriation Act. Under this procedure, project approval at this level is authorized by the Major Command concerned, or delegated to the R&D installation commanders as appropriate. The table below provides a summary total of such minor construction accomplished in FY 1981 and the estimated amounts planned for FY 1982, FY 1983, and FY 1984. All minor construction must result in a complete and useable facility. In no event are two or more minor construction projects or minor and major construction projects to be contrived to form a useable facility.

SUMMARY OF MINOR CONSTRUCTION FUNDED BY RDT&E, NAVY
(\$ in thousands)

	<u>FY 1981</u>	<u>FY 1982</u>	<u>FY 1983</u>	<u>FY 1984</u>
TOTAL, Part III	<u>4,305</u>	<u>5,208</u>	<u>6,698</u>	<u>7,371</u>
GRAND TOTAL*	<u>14,223</u>	<u>14,319</u>	<u>18,384</u>	<u>72,181</u>

* Major Improvements to, and Construction of Government-Owned Facilities funded by Research, Development, Test and Evaluation

1. COMPONENT NAVY		FY 19⁸³ MILITARY CONSTRUCTION PROJECT DATA			2. DATE FEB 1982	
3. INSTALLATION AND LOCATION EXTREMELY LOW FREQUENCY COMMUNICATIONS (ELF COMM) WISCONSIN TEST FACILITY (WTF) CLAM LAKE, WISCONSIN				4. PROJECT TITLE ELF COMM WTF ALTERATION		
5. PROGRAM ELEMENT 1 14 01 N		6. CATEGORY CODE 317-10	7. PROJECT NUMBER P-350 X0792		8. PROJECT COST (\$000) 4,400	
9. COST ESTIMATES						
ITEM					U/M	QUANTITY
					UNIT COST	COST (\$000)
ALTER RDT&E TRANSMITTER FACILITY.					SF	8,400
BACKUP POWER BUILDING ADDITION.					SF	8,400 300.00
FACILITY ALTERATIONS.					LS	-
BUILT IN EQUIPMENT.					LS	-
SUPPORTING FACILITIES.					LS	-
SITE IMPROVEMENTS.					LS	-
PAVING.					LS	-
SUBTOTAL.					-	4,965
CONTINGENCY (5%).					-	248
TOTAL CONTRACT COST.					-	5,213
SUPERVISION, INSPECTION & OVERHEAD (3%).					-	156
TOTAL REQUEST.					-	5,369
TOTAL REQUEST (ROUNDED).					-	4,400
EQUIPMENT PROVIDED FROM OTHER APPROPRIATIONS.					-	(0)
EQUIPMENT/GENERATORS (NON-ADD)						(1,000)
10. DESCRIPTION OF PROPOSED CONSTRUCTION						
Alter existing transmitter control room to incorporate new equipment, modify existing support systems and construct additional single story, concrete block, RDT&E support facilities; utilities. Project design must include provisions for electronic equipment to be procured and installed with other appropriations (see paragraph 6. of the facility study); in accordance with NAVMATINST 5430.21C development of a BESEP by NAVELEX may be required.						
11. REQUIREMENT: 16384 SF. ADEQUATE: 7984 SF. SUBSTANDARD: 0 SF.						
PROJECT: This 1391 project documentation is submitted as an addendum to the FY 83 RDT&E budget request under the auspices of Title 10 USC 2353 with regard to using RDT&E funds for construction purposes. Provides RF shielded enclosure to validate HEMP characteristics of newly developed ELF RDT&E equipment and facility expansion to house backup power system to verify RDT&E system performance under contingency situations. Equipment is scheduled for delivery in 1984.						
REQUIREMENT: Expanded facilities at the ELF Wisconsin Test Facility to validate a modified ELF transmitter system performance. The Wisconsin Test Facility was built in 1969 as an RDT&E test bed to substantiate that ELF signals could be transmitted and then received aboard submarines. Subsequent to the validation of the theory, specific performance goals and transmission system specifications have been established which require replacement or additions to certain segments of the transmitter equipments. In order to substantiate system operating parameters prior to the production of another unique operating system, the RDT&E test bed must be						

1. COMPONENT	FY 19_83 MILITARY CONSTRUCTION PROJECT DATA		2. DATE
NAVY			FEB 1982
3. INSTALLATION AND LOCATION Extremely Low Frequency Communications (ELF COMM) Wisconsin Test Facility (WTF) Clam Lake, Wisconsin			
4. PROJECT TITLE		5. PROJECT NUMBER	
ELF COMM WTF ALTERATION		P-350 X0792	
11. (Continued) improved to incorporate all system operating constraints. Primary improvements will be made to the facility's High-altitude ElectroMagnetic Pulse (HEMP) protection and ElectroMagnetic Compatibility (EMC) characteristics to house an expanded equipment suite, and the addition of a HEMP protected alternate power source (generators) with associated switchgear to verify system performance mandates for contingency conditions. <u>CURRENT SITUATION:</u> WTF has been providing test signals to prototype receivers using the originally developed equipment. The Presidential decision expressed in his 8 October 1981 letter authorizes fielding of a small operational ELF system and the CNO requirements letter Ser 941/S343153 of 17 December 1981 defines performance characteristics of this system. Requirements specify development of a second synchronously operated site. The currently installed equipment does not meet the operational specifications nor have the desired capabilities (HEMP and backup power). In order to prove system performance and confirm design, the RDT&E configuration needs to be replaced in part and expanded to reflect an operational system. <u>IMPACT IF NOT PROVIDED:</u> NAVY will not make IOC as directed by the President. <u>ADDITIONAL:</u> This documentation is forwarded as an FY-83 budget addendum for use of RDT&E funds for construction purposes under the auspices of Title 10 U.S.C. 2353 rather than as a request for MILCON funding. The construction effort contained herein is a valid use of RDT&E funds since it is a required improvement to an RDT&E facility in order to verify total system performance before fielding a second site. The construction for the second site is to be programmed using MILCON appropriations.			

1. COMPONENT NAVY		FY 19 <u>82</u> MILITARY CONSTRUCTION PROJECT DATA			2. DATE March 82	
3. INSTALLATION AND LOCATION NIROP Sunnyvale Sunnyvale, CA				4. PROJECT TITLE Civil Works in Support of Machine Tool Installation		
5. PROGRAM ELEMENT		6. CATEGORY CODE		7. PROJECT NUMBER		8. PROJECT COST (\$000) \$ 254
9. COST ESTIMATES						
ITEM				U/M	QUANTITY	COST (\$000)
Civil Works to Support Machine Tool Installation (sound proof rooms, dust collection systems, hoist installations, HVAC modifications, etc.)						\$ 241
NAVFAC Supervision, Inspection & Overhead (SIOH) 5%						$\frac{13}{\$ 254}$
EQUIPMENT (Non-Add)						(3,046)
10. DESCRIPTION OF PROPOSED CONSTRUCTION						
These projects will provide sound proofing, dust collection systems, hoist installations, HVAC modifications, and other construction necessary for installation of machine tools which will be used for TRIDENT II missile development and production. <u>Requirement:</u> Machine tools are used in the manufacturing of parts for the TRIDENT II missile.						

1. COMPONENT NAVY	FY 19 <u>83</u> MILITARY CONSTRUCTION PROJECT DATA		2. DATE March 82
3. INSTALLATION AND LOCATION NIROP Sunnyvale Sunnyvale, CA			
4. PROJECT TITLE Civil Works in Support of Machine Tool Installation		5. PROJECT NUMBER	
<u>Current Situation:</u> The existing machine tools do not have the capacity to handle the larger parts required for the increased size of the TRIDENT II missile. <u>Impact If Not Provided:</u> Development and production of the TRIDENT II missile would not be possible. <u>Pollution Prevention, Abatement & Control:</u> No additional air and water pollution is anticipated. <u>Floodplain Management and Protection of Wetlands:</u> Not applicable. <u>Environmental Impact:</u> No environmental impact is generated by these projects. <u>International Balance of Payments Procedures:</u> Not applicable. <u>Preservation of Historical Sites and Structures:</u> Not applicable.. <u>Design for Accessibility of Physically Handicapped Personnel:</u> Provisions for the physically handicapped are incorporated in this facility.			

1. COMPONENT NAVY	FY 19 ⁸³ MILITARY CONSTRUCTION PROJECT DATA	2. DATE March 82
3. INSTALLATION AND LOCATION NIROP Sunnyvale Sunnyvale, CA		
4. PROJECT TITLE Civil Works in Support of Machine Tools Installation		5. PROJECT NUMBER
<u>Justification for Project:</u> The TRIDENT II program requires machining large metal and composite parts of the missile. These operations generate noise levels above standard safety levels, generate carbon graphite and other kinds of dust in excess of acceptable limits set by applicable codes for Industrial Hygiene and Safety; and require electrical power, HVAC, and materials Handling additions, alterations, and modifications. These projects are needed to comply with health and safety standards for operating personnel and to provide service necessary to support the machine installations. The machines are necessary for the development and production of the TRIDENT II missile.		

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1. COMPONENT NAVY		FY 19 <u>83</u> MILITARY CONSTRUCTION PROJECT DATA		2. DATE March 82	
3. INSTALLATION AND LOCATION NIROP Sunnyvale Sunnyvale, CA			4. PROJECT TITLE Civil Works in Support of Machine Tool Installation		
5. PROGRAM ELEMENT		6. CATEGORY CODE	7. PROJECT NUMBER		8. PROJECT COST (\$000) \$ 1,982
9. COST ESTIMATES					
ITEM			U/M	QUANTITY	COST (\$000)
Civil Works to Support Machine Tool installations (sound proof rooms, dust collection systems, hoist installations, HVAC modifications, etc.)					\$ 1,879
NAVFAC Supervision, Inspection & Overhead (SION) 5%					103 \$ 1,932
EQUIPMENT (Non-Add)					(16,371)
10. DESCRIPTION OF PROPOSED CONSTRUCTION					
These projects will provide sound proofing, dust collection systems, hoist installations, HVAC modifications, and other construction necessary for installation of machine tools which will be used for TRIDENT II missile development and production. <u>Requirement:</u> Machine tools are used in the manufacturing for the TRIDENT II missile.					

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1. COMPONENT NAVY	FY 19 ⁸³ MILITARY CONSTRUCTION PROJECT DATA	2 DATE March 82
3 INSTALLATION AND LOCATION NIROP Sunnyvale Sunnyvale, CA		
4. PROJECT TITLE Civil Works in Support of Machine Tool Installation		5. PROJECT NUMBER
<u>Current Situation:</u> The existing machine tools do not have the capacity to handle the larger parts required for the increased size of the TRIDENT II missile. <u>Impact If Not Provided:</u> Development and production of the TRIDENT II missile would not be possible. <u>Pollution Prevention, Abatement & Control:</u> No additional air and water pollution is anticipated. <u>Floodplain Management and Protection of Wetlands:</u> Not applicable. <u>Environmental Impact:</u> No environmental impact is generated by these projects. <u>International Balance of Payments Procedures:</u> Not applicable. <u>Preservation of Historical Sites and Structures:</u> Not applicable.. <u>Design for Accessibility of Physically Handicapped Personnel:</u> Provisions for the physically handicapped are incorporated in this facility.		

1. COMPONENT NAVY	FY 19 ⁸³ MILITARY CONSTRUCTION PROJECT DATA	2. DATE March 82
3. INSTALLATION AND LOCATION NIROP Sunnyvale Sunnyvale, CA		
4. PROJECT TITLE Civil Works in Support of Machine Tools Installation		5. PROJECT NUMBER
<u>Justification for Project:</u> The TRIDENT II program requires machining large metal and composite parts of the missile. These operations generate noise levels above standard safety levels, generate carbon graphite and other kinds of dust in excess of acceptable limits set by applicable codes for Industrial Hygiene and Safety; and require electrical power, HVAC, and materials Handling additions, alterations, and modifications. These projects are needed to comply with health and safety standards for operating personnel and to provide service necessary to support the machine installations. The machines are necessary for the development and production of the TRIDENT II missile.		

1. COMPONENT NAVY		FY 1983 MILITARY CONSTRUCTION PROJECT DATA		2. DATE Feb 1982	
3. INSTALLATION AND LOCATION Hunters Point Surface Launch Test Complex (HPSLTC) San Francisco, California			4. PROJECT TITLE Upgrade Surface Launch Complex to Accommodate TRIDENT II Development		
5. PROGRAM ELEMENT		6. CATEGORY CODE		7. PROJECT NUMBER B0951	
				8. PROJECT COST (\$000) \$2241	
9. COST ESTIMATES					
ITEM				U/M	QUANTITY
				UNIT COST	COST (\$000)
Capital Acquisition Projects to support Trident II Testing					\$2,241
a. Instrumentation Building				SF	3300
b. Instrumentation Remote Storage/Interface Building				SF	200
c. G1/G2 Crane Upgrade				LS	1,098
d. New Launch Pad (design)					26
e. Crane Track Modification					82
Addition (design) -					506
f. Pier Facing Berth 20 (design)					18
g. Hoist Proofing Foundation (design)					
h. NAVFAC Supervision, Inspection and Overhead (SIOH) 5.5%					117
					\$2,241
Equipment (Non-Add) Figures Not Applicable					
10. DESCRIPTION OF PROPOSED CONSTRUCTION					
a. A new instrumentation building and remote storage/interface building will be required to house the new Data Acquisition System used to support Trident II testing requirements. b. Upgrade the G1 and G2 Crane from 112,000# to 180,000# capacity. c. Provide design work in preparation for a new launch pad, crane track modification and addition, pier facing (berth 20), and a hoist proofing foundation.					
11. <u>PROJECT</u> : Provide additional facilities to support Trident II testing.					

1. COMPONENT NAVY	FY 19 ⁸³ MILITARY CONSTRUCTION PROJECT DATA	2. DATE Feb 1982
3. INSTALLATION AND LOCATION Hunters Point Surface Launch Test Complex (HPSLTC) San Francisco, California		
4. PROJECT TITLE Upgrade Surface Launch Complex to Accommodate TRIDENT II Development		5. PROJECT NUMBER B0951
REQUIREMENT: HPSLTC has responsibility for all missile and launcher surface testing to support development, reliability, environmental, and qualification requirements. The procurement of the following items will satisfy all known requirements for these items at HPSLTC for the next 15 years. a. New launch pad. b. Crane track modification and addition. c. New exterior pier wall facings. d. Hoist Proofing Foundation. e. Instrumentation Buildings for Data Acquisition System. f. Upgrade of G1/G2 cranes. CURRENT SITUATION: a. The current instrumentation building houses a Data Acquisition System which is utilized to its capacity. Air Conditioning and humidity requirements of the new Data Acquisition System are beyond the capabilities of the existing building. In addition, the present instrumentation building is in the explosive, "Quantity Distance Safety" area of a proposed new launch pad and must be relocated. b. The present capacity of the "G" cranes is 112,000# which is inadequate to handle the increased weight (130K# Max) of the Trident II Test Vehicle. c. A new launch pad will be required to permit uninterrupted test operations during the period of time (approximately one year) when planned construction is being performed adjacent to the present launch pad #2. d. Portions of the existing crane test must be relocated to permit installation of the new launch pad. Tracks outside the site have been condemned necessitating addition of a switching "Y" on the site. e. Deterioration of the pier cells supporting the area around the existing launch pad and the proposed launch pad necessitates the construction of a new pier wall.		

1 COMPONENT NAVY	FY 19 <u>83</u> MILITARY CONSTRUCTION PROJECT DATA	2 DATE Feb 1982
3 INSTALLATION AND LOCATION Hunters Point Surface Launch Test Complex (HPSLTC) San Francisco, California		
4 PROJECT TITLE Upgrade Surface Launch Complex to Accommodate TRIDENT II Development		5. PROJECT NUMBER B0951
f. The construction of a Hoist Proof Foundation is required to permit static load testing of the Trident II hoists. <u>IMPACT IF NOT PROVIDED:</u> Deferral of these projects would result in a major delay in the development and deployment of a Trident II weapon system. <u>POLLUTION PREVENTION, ABATEMENT AND CONTROL:</u> This project will not cause additional air or water pollution. <u>FLOODPLAIN MANAGEMENT AND PROTECTION OF WETLANDS:</u> Requirements of Executive Order No. 11988 (Floodplain Management) and Executive Order 11990 (Protection of Wetlands) are not applicable. <u>ENVIRONMENTAL IMPACT:</u> A preliminary environmental assessment has been made and it has been determined that the proposed project will not impact the environment. <u>INTERNATIONAL BALANCE OF PAYMENTS PROCEDURES:</u> N/A <u>PRESERVATION OF HISTORICAL SITES AND STRUCTURES:</u> The project does not directly or indirectly affect a district, site, building, structure, object or setting which listed in, or eligible for listing in, the National Register or other wise possesses a significant quality of American History, Archeology, Architecture, or Culture. <u>DESIGN FOR ACCESSIBILITY OF PHYSICALLY HANDICAPPED PERSONNEL:</u> Provisions for physically handicapped personnel are not required at this facility.		

1 COMPONENT NAVY	FY 19 <u>83</u> MILITARY CONSTRUCTION PROJECT DATA	2 DATE Feb 1982
3 INSTALLATION AND LOCATION Hunters Point Surface Launch Test Complex (HPSLTC) San Francisco, California		
4. PROJECT TITLE Upgrade Surface Launch Complex to Accommodate TRIDENT II Development		5. PROJECT NUMBER B0951
<u>JUSTIFICATION FOR PROJECT:</u> INSTRUMENTATION BUILDING - An instrumentation building will be required to house the new Data Acquisition System (DAS) which is required for Trident II testing; the present instrumentation building is inadequate because: 1. The present instrumentation building is within the "Quantity Distance Safety" area of a proposed new launch pad. Quantity Distance Safety area is that area which must be evacuated when a gas generator is fired. The DAS must be manned during a test. 2. Major modifications to the present instrumentation building would be required to house the new DAS because: a. The present building could not be insulated and air conditioned adequately to support the environmental requirements of the new DAS without major modifications. b. The present building does not provide adequate space for maintenance/repair of the DAS. 3. The present instrumentation building will be used to satisfy OSHA requirements for lunch room facilities. G1/G2 CRANE UPGRADE - The present capacity of the "G" Cranes is 112,00#, the combined weight of the Trident II test vehicles and handling gear is approximately 180,000#. A tradeoff study of all potential handling options found upgrading the cranes to this capacity the most cost effective. HOIST/MISSILE BUILDING MODIFICATION - The present structure will not accomodate the larger and heavier Trident II missile and must be enlarged and strengthened. NEW LAUNCH PAD - In order to maintain uninterrupted testing capabilities during construction adjacent to the main launch pad (pad #2) a new launch pad will be required. CRANE TRACK MODIFICATION AND ADDITION - The construction of a new launch pad necessitates the moving of a section of a crane track; also, the tracks outside of the site have been condemned and a switching "Y" is required to allow for the switching of cranes.		

1. COMPONENT Navy	FY 1983_MILITARY CONSTRUCTION PROJECT DATA	2. DATE Feb 1982
3. INSTALLATION AND LOCATION Hunters Point Surface Launch Test Complex (HPSLTC), San Francisco, CA		
4. PROJECT TITLE Upgrade Surface Launch Complex to Accommodate TRIDENT II Development		5. PROJECT NUMBER B0951
NEW EXTERIOR PIER WALL FACINGS - The pier construction consists of a series of cells, each cell is formed by numerous steel pilings and the cell is filled with sand. Deterioration of the steel pilings necessitates the installation of new pier wall facings to prevent collapse of the pier. HOIST PROOF FOUNDATION - Hunters Point presently does not have the capability of static loading Trident II missile hoists to their maximum capacity; the hoist proof foundation will satisfy this requirement. <u>JUSTIFICATION FOR SCOPE OF PROJECT:</u> In May 1978 the Surface Launch Facility Working Group (SLFWG) was formed to identify MILCON/RDT&E requirements and costs associated with providing HPSLTC Trident II testing capabilities. The SLFWG committee consisted of Contractor and Navy personnel working in conjunction with Naval Facilities Western Division. The initial study was completed in January 1979; the results were published in Westinghouse Electric Corporation Technical Note 79-009, dated January 1979 and prepared under contract N0003074C0132. This SLFWG report and/or upgrades to it included the requirement for the following facilities: - Instrumentation Buildings - G1/G2 Upgrade - New Launch Pad - Crane Track Modification and Addition - New Exterior Wall Facings - Hoist Proofing Foundation		

1 COMPONENT Navy		FY 1983 MILITARY CONSTRUCTION PROJECT DATA		2 DATE Dec 1981	
3 INSTALLATION AND LOCATION Naval Research Laboratory Washington, DC 20375			4. PROJECT TITLE Radio Frequency Chambers		
5. PROGRAM ELEMENT 65862N	6 CATEGORY CODE N/A	7. PROJECT NUMBER R0137	8. PROJECT COST (\$000) 1860		
9 COST ESTIMATES					
ITEM		U/M	QUANTITY	UNIT COST	COST (\$000)
In-House Design/Management FY-83 Installation - Special Chambers: (Completed)					548
Equipment Acquisition, by Separate Contract(s)					1312
TOTAL					1860
Equipment (Non-Add)					(588)
10. DESCRIPTION OF PROPOSED CONSTRUCTION					
Start of a multiyear installation contract. Facilities for the installation of special chambers and associated control/observation areas will be provided for MCON Project P-280, Electromagnetic Development Laboratory. Work included in the placement of these chambers involves (1) the installation of a wideband RF chamber, shielded and lined with anechoic materials and (2) the installation of an airframe chamber, shielded and lined with anechoic materials. The necessary utility connections and modifications will be made. Structural additions and modifications will be made as required to provide appropriate control and observation spaces. The Naval Research Laboratory conducts a multi-disciplined program of scientific research and development. This program is directed toward the attainment of new and improved materials, equipment, techniques, and systems for the Navy. The Tactical Electronics Warfare Division of NRL is responsible for research and development in support of the Navy's tactical and strategic electronics warfare (EW) requirements and missions. These responsibilities include EW support measures, electronic countermeasures, supporting counter-countermeasures, as well as studies, analyses and simulations for the determination and improvement of operational EW effectiveness. These functional facilities are required to permit advanced development and evaluation of airborne EW systems through wider application of fruitful simulation techniques representing realistic tactical events under controlled laboratory conditions. This project provides the two chamber facilities essential to augment NRL's funded programs and permits the achievements of a laboratory integrated facility for airborne EW research and development.					

1. COMPONENT Navy		FY 1983 MILITARY CONSTRUCTION PROJECT DATA		2. DATE Dec 1981	
3. INSTALLATION AND LOCATION Naval Research Laboratory Washington, DC 20375			4. PROJECT TITLE Central Target Simulator (CTS) Facility		
5. PROGRAM ELEMENT 65862N	6. CATEGORY CODE N/A	7. PROJECT NUMBER R0137		8. PROJECT COST (\$000) 270	
9. COST ESTIMATES					
ITEM		U M	QUANTITY	UNIT COST	COST (\$000)
System Engineering Software Development & Support					270
Equipment (Non-Add) RF Environment Simulator Post Processor/Controller					(1000) (65)
10. DESCRIPTION OF PROPOSED CONSTRUCTION					
The equipment is to be installed in the Central Target Simulation (CTS) Facility in FY 1983. The CTS Facility is a large scale hardware-in-the-loop simulator for use in RDT&E activities for Electronic Warfare systems and techniques. The R&D performed in the facility is primarily directed at countering the missile threat to the Navy.					

1. COMPONENT Navy		FY 1981 MILITARY CONSTRUCTION PROJECT DATA		2. DATE Dec 1981	
3. INSTALLATION AND LOCATION Naval Air Test Center Patuxent River, MD			4. PROJECT TITLE Central Air Conditioning System, Hangar 144		
5. PROGRAM ELEMENT 65864N	6. CATEGORY CODE 317-10	7. PROJECT NUMBER E-4-80		8. PROJECT COST (\$000) 100	
9. COST ESTIMATES					
ITEM		U/M	QUANTITY	UNIT COST	COST (\$000)
Centralized Aircraft Cooling System		LS			100
Equipment (Non-Add) figures not applicable					
10. DESCRIPTION OF PROPOSED CONSTRUCTION					
This centralized system with an outside location of A/C units, external to the shielded hangar deck, is required to minimize electromagnetic interference and to provide a means of controlling and supplying conditioned air via a non-metallic supply system inside shielded area. This system will also eliminate project delays due to the limited availability of portable units from the flight line.					

1. COMPONENT Navy		FY 1982 MILITARY CONSTRUCTION PROJECT DATA		2. DATE Dec 1981	
3. INSTALLATION AND LOCATION Naval Air Test Center Patuxent River, MD			4. PROJECT TITLE Unabated engine test facility		
5. PROGRAM ELEMENT 65864N		6. CATEGORY CODE 211-66	7. PROJECT NUMBER EC6-81	8. PROJECT COST (\$000) 170 (Equip. Instal.)	
9. COST ESTIMATES					
ITEM		U/M	QUANTITY	UNIT COST	COST (\$000)
Installation of jet engine test stands (T-23 and T-24) with secondary power					170
Equipment (Non-Add) figures not applicable					
10. DESCRIPTION OF PROPOSED CONSTRUCTION					
This facility will operationally test jet aircraft engines out of frame. In addition to normal jet engine testing, a newly designed and constructed jet engine test stand (A/M 37T-23) will undergo evaluation. The T-23 will be used by deployable units acting as a backup to an Aircraft Intermediate Maintenance Department (AIMD). The T-24 will test torbo shaft engines. The existing unabated jet engine test facility is unsatisfactory. It does not meet Office of Safety and Health Administration (OSHA) or Air Installations Compatible Use Zones (AICUZ) requirements. This new site will satisfy these requirements.					

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1 COMPONENT Navy		FY 1982 MILITARY CONSTRUCTION PROJECT DATA			2 DATE Dec 1981	
3 INSTALLATION AND LOCATION Pacific Missile Test Center Point Mugu, CA			4 PROJECT TITLE Electric Power Transfer System, San Nicolas Island			
5 PROGRAM ELEMENT 65864N	6 CATEGORY CODE 311-10	7. PROJECT NUMBER ER1-82	8. PROJECT COST (\$000) 150 (Equip. Instal.)			
9 COST ESTIMATES						
ITEM		U/M	QUANTITY	UNIT COST	COST (\$000)	
Installation of 175 KW diesel generator with automatic transfer switch, circuit breaker, battery charger and rack, switchboard distribution and alarm.					150	
Equipment (Non-Add) figures not applicable						
10. DESCRIPTION OF PROPOSED CONSTRUCTION Automatic emergency power system used to charge batteries and maintain emergency power to building 127 which conducts RDT&E of aerodynamic design of aircraft and Weapons Systems. The existing system is completely in-operative, with only one-half hour backup time on microwave batteries.						

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1. COMPONENT NAVY		FY 19 <u>81</u> MILITARY CONSTRUCTION PROJECT DATA		2. DATE NOV 1981	
3. INSTALLATION AND LOCATION NAVAL UNDERWATER SYSTEMS CENTER NEWPORT LABORATORY, NEWPORT, RI			4. PROJECT TITLE NON-ACOUSTICS LABORATORY		
5. PROGRAM ELEMENT 62711N		6. CATEGORY CODE 315-30	7. PROJECT NUMBER SF11125491	8. PROJECT COST (\$000) 125	
9. COST ESTIMATES					
ITEM		U/M	QUANTITY	UNIT COST	COST (\$000)
Air Conditioning		LS	--	--	30
Install Security Walls		LS	--	--	52
Electrical		LS	--	--	16
Heating & Piping		LS	--	--	11
Security System		LS	--	--	5
Fire Protection		LS	--	--	6
Replace Roofing		LS	--	--	5
TOTAL:					125
Equipment (Non-Add)					750
10. DESCRIPTION OF PROPOSED CONSTRUCTION					
Provides for the modification of Bldg. 117 by installing security walls, shielding, a security system, secure doors, alarm fire protection and alarm system, filtered electrical power, and environmental control to provide a secure non-acoustic laboratory.					

1. COMPONENT NAVY		FY 1981 MILITARY CONSTRUCTION PROJECT DATA		2. DATE NOV 1981	
3. INSTALLATION AND LOCATION NAVAL UNDERWATER SYSTEMS CENTER NEWPORT LABORATORY, NEWPORT, RI			4. PROJECT TITLE INTEGRATED TARGET FACILITY BLDG. 116		
5. PROGRAM ELEMENT 11221N - 350K 63610N - 600K		6. CATEGORY CODE 315-20	7. PROJECT NUMBER S1265 S0199		8. PROJECT COST (\$000) 950
9. COST ESTIMATES					
ITEM		U/M	QUANTITY	UNIT COST	COST (\$000)
Access Floor		SF	4,500	10	45
Demountable Partition		LF	680	70	48
CO ₂		LS	--	--	34
HVAC		LS	--	--	244
Misc. Mech.		LS	--	--	179
Transformer		EA	1	10,000	12
Distribution		LS	--	--	50
400-Hz Motor Generator		EA	1	20,000	20
Security Alarm		LS	--	--	125
Misc. Elec.		LS	--	--	193
TOTAL:					950
Equipment (Non-Add)					5,000
10. DESCRIPTION OF PROPOSED CONSTRUCTION					
The Integrated Target Facility is a multi-function complex of hardware and software laboratories dedicated to the development and life cycle support of the entire class of mobile submarine simulators, from total analog types to the new software controlled digital vehicles. Mobile submarine simulators include submarine counter-measure devices as well as mobile targets.					

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OFFICE OF THE COMPTROLLER (NAVY) WASHINGTON DC

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DEPARTMENT OF THE NAVY JUSTIFICATION OF ESTIMATES FOR FISCAL YE--ETC(U)
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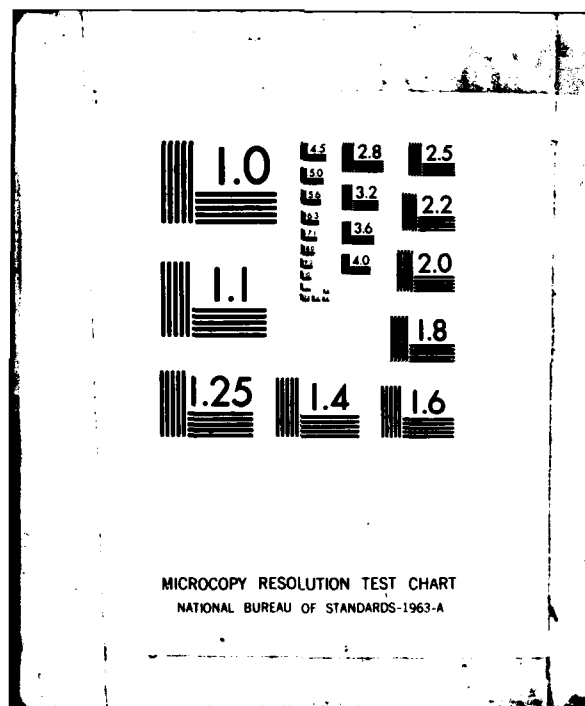
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1 COMPONENT Navy		FY 1983 MILITARY CONSTRUCTION PROJECT DATA		2 DATE Dec 1981	
3 INSTALLATION AND LOCATION Naval Underwater Systems Center Newport, RI			4 PROJECT TITLE TRIDENT Submarine Land Based Evaluation Facility (LBEF)		
5. PROGRAM ELEMENT 11228N	6. CATEGORY CODE	7. PROJECT NUMBER B0004-SB	8. PROJECT COST (\$000) 365		
9. COST ESTIMATES					
ITEM	U/M	QUANTITY	UNIT COST	COST (\$000)	
TRIDENT Submarine Land Based Evaluation Facility					
Reroute and rebalance air conditioning			175		
Reroute cable trap			85		
Relocate bulkheads & change room configuration			95		
Relocate equipment cooling (pure water, etc.)			10		
TOTAL				365	
* Trainer Unique S/W Maintenance Capability	Various	Various			
* TRIDENT Support Complex Updates					
* Non-add equipment costs				(2470)	
10. DESCRIPTION OF PROPOSED CONSTRUCTION Modifications to the Land Based Evaluation Facility (LBEF) and development labs - Defensive Weapons System (DWS) Maintenance Lab, Data Processing Equipment Lab and the Monitor Subsystem Lab. This requires foundation installation, ventilation restructuring, implementation and installation of environmental controls. This includes the redesign, installation and check-out of equipments and systems within the labs.					
11. Requirement: PROJECT: The TRIDENT Submarine Land-Based Evaluation Facility (LBEF) is being used for system level testing and software certification for the TRIDENT Command and Control System. REQUIREMENT: As the Defensive Weapons System (DWS) and Monitoring and other subsystems are modified within the Command and Control System, the Land Based Evaluation Facility (LBEF) and developmental labs must be changed to reflect the updates. Concurrent with any changes to a subsystem, the computer program must be reviewed and modified to assure that the hardware/software is compatible with the revised subsystem configuration. This in turn requires the equipment in the laboratory to be modified to the latest configuration. IMPACT IF NOT PROVIDED: The TRIDENT Command and Control System represents a marriage of the hardware and software and must be tested as a system. This is a primary function of the Land Based Evaluation Facility (LBEF).					

1. COMPONENT Navy		FY 19_83 MILITARY CONSTRUCTION PROJECT DATA		2. DATE Dec 1981	
3. INSTALLATION AND LOCATION Naval Weapons Center China Lake, CA			4. PROJECT TITLE Wells Air Start System		
5. PROGRAM ELEMENT 65864N		6. CATEGORY CODE 110-10	7. PROJECT NUMBER E1-83	8. PROJECT COST (\$000) 100	
9. COST ESTIMATES					
ITEM			U/M	QUANTITY	COST (\$000)
Wells Air Start System Armitage airfield				1	100
Equipment (Non-Add) figures not applicable					
10. DESCRIPTION OF PROPOSED CONSTRUCTION This project will install additional existing compressor, accumulator tank, piping and consoles to add four (4) additional air start stations. The present system can service two aircraft. Completion of this project will release at least three mobile start units to fleet and squadron use.					

1. COMPONENT Navy		FY 19 <u>83</u> MILITARY CONSTRUCTION PROJECT DATA		2. DATE Dec 1981	
3. INSTALLATION AND LOCATION Naval Weapons Center China Lake, CA			4. PROJECT TITLE HYDRO SHAKER		
5. PROGRAM ELEMENT 65864N		6. CATEGORY CODE	7. PROJECT NUMBER E2-83	8. PROJECT COST (\$000) 150	
9. COST ESTIMATES					
ITEM		U/M	QUANTITY	UNIT COST	COST (\$000)
HYDRO SHAKER			1		150
Equipment (Non-Add) figures not applicable					
10. DESCRIPTION OF PROPOSED CONSTRUCTION					
This project will install a Hydro Shaker (Vibratory equipment) that will test missiles and components throughout a varied spectrum for low to high frequencies. This will give an indication of mean time between failure (MTBF) which gives an indication (simulated) of ship- and aircraft flight conditions.					

1. COMPONENT Navy		FY 19_83 MILITARY CONSTRUCTION PROJECT DATA		2. DATE Dec 1981	
3. INSTALLATION AND LOCATION Naval Air Propulsion Center Trenton, NJ			4. PROJECT TITLE Refrigeration System for Cruise Missile		
5. PROGRAM ELEMENT 65864N	6. CATEGORY CODE 318-10	7. PROJECT NUMBER E4-80	8. PROJECT COST (\$000) 4100		
9. COST ESTIMATES					
ITEM		U/M	QUANTITY	UNIT COST	COST (\$000)
Air Conditioning System including packaged refrigeration, cooling chambers, ducting, glycol spray, brine pumping, hydraulic, instrumentation, and insulation					292
Equipment (non-add)					(3808)
10. DESCRIPTION OF PROPOSED CONSTRUCTION					
The center has insufficient refrigeration capacity to fully support the increases in test workload expected from the cruise missile program, other high priority Navy engine programs and fleet problems. The installation of the 4th refrigeration system will correct this deficiency, provide backup for three aging systems and allow the center to retain its present multicell test capability.					

1. COMPONENT Navy		FY 1982 MILITARY CONSTRUCTION PROJECT DATA		2. DATE Dec 1981	
3. INSTALLATION AND LOCATION Naval Ocean Systems Center San Diego, CA 92152			4. PROJECT TITLE Install Interactive Graphics Equipment		
5. PROGRAM ELEMENT 68562	6. CATEGORY CODE 317-15	7. PROJECT NUMBER Z0833	8. PROJECT COST (\$000) 150		
9. COST ESTIMATES					
ITEM		U/M	QUANTITY	UNIT COST	COST (\$000)
Install 1 Central Processor 5 Work Stations		LS	-	-	45
Install 4 Work Stations, Bldg A-33		LS	-	-	25
Install 3 Work Stations, Bldg A-35		LS	-	-	20
Install 3 Secure Work Stations, Bldg 600		LS	-	-	20
Install 2 Work Stations, Bldg 560		LS	-	-	20
Install 2 Work Stations, Bldg 56		LS	-	-	20
Total					150
Equipment (Non-Add) figures not applicable					
10. DESCRIPTION OF PROPOSED CONSTRUCTION					
Installation of Interactive Graphics Equipment. This equipment and the connected systems will increase the productivity of design engineers by assuming some of the routine tasks associated with the development of a technical proposal, idea or solution to a problem. Interactive graphics is considered to be a drafting board as a calculator is to the slide rule. It will include electronic design, mechanical design, facility design, etc. These funds would install the central complex and satellite complexes. The UNIVAC 1100/82 will be connected to the graphics system for execution of computer board analysis program. The acquisition of the system for all Navy Laboratories is being executed by the Naval Weapons Center.					

1. COMPONENT Navy		FY 1982 MILITARY CONSTRUCTION PROJECT DATA		2. DATE Dec 1981	
3. INSTALLATION AND LOCATION David Taylor Naval Ship R&D Center Annapolis Laboratory, Annapolis, MD			4. PROJECT TITLE Install CDC 6000 Computer		
5. PROGRAM ELEMENT 65862N		6. CATEGORY CODE 310-33	7. PROJECT NUMBER ECR 19-82		8. PROJECT COST (\$000) 152
9. COST ESTIMATES					
ITEM		U/M	QUANTITY	UNIT COST	COST (\$000)
Install CDC 6000 Computer		LS			152
Equipment (non-add)					(2000)
10. DESCRIPTION OF PROPOSED CONSTRUCTION					
The equipment to be installed consists of a CDC Model 6000 Computer and its ancillary equipment which require, as part of the installation, raised flooring, special air conditioning, machinery cooling (chilled water), and fire prevention/alarm systems. In addition to the installation costs, related alterations and repairs (to be funded from NIF accruals) with a funded cost of approximately \$90,000 will be accomplished as an integrated combination project totaling approximately \$242,000.					

1 COMPONENT Navy		FY 1982 MILITARY CONSTRUCTION PROJECT DATA		2 DATE Dec 1981	
3. INSTALLATION AND LOCATION Naval Surface Weapons Center White Oak, MD			4. PROJECT TITLE Installation of Computer Aided Design and Drafting Facility		
5. PROGRAM ELEMENT 65862N	6. CATEGORY CODE 143-40	7. PROJECT NUMBER EA1-82	8. PROJECT COST (\$000) 158		
9 COST ESTIMATES					
ITEM		U/M	QUANTITY	UNIT COST	COST (\$000)
Equipment installation of additional Central Processing Facility of computer aided design and drafting equipment. Equipment installation includes raised floors, air conditioning, and electrical service.					158
Equipment (non-add)					(520)
10. DESCRIPTION OF PROPOSED CONSTRUCTION					
Install computer aided design and drafting (CADD) equipment to be supplied by the Naval Laboratories Interactive Graphic Programs under the direction of the Director of Naval Laboratories. Equipment installation includes providing raised flooring, additional air conditioning, and electrical service in existing building space. This project is being initiated and sponsored by the Director of Navy Laboratories (DNL) to expedite the preparation of production documents and facilitate the communication of technological data among all Naval Laboratories.					

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1 COMPONENT Navy		FY 1982 MILITARY CONSTRUCTION PROJECT DATA		2 DATE Dec 1981	
3 INSTALLATION AND LOCATION Naval Surface Weapons Center Dahlgren, VA 22448			4 PROJECT TITLE Installation of Computer Aided Design and Drafting Facility		
5. PROGRAM ELEMENT 65862N	6. CATEGORY CODE 316-10	7. PROJECT NUMBER EA2-82	8. PROJECT COST (\$000) 117		
9. COST ESTIMATES					
ITEM	U/M	QUANTITY	UNIT COST	COST (\$000)	
Equipment installation of Central Processing Facility of computer aided design and drafting equipment. Equipment installation includes raised floors, air conditioning, and electrical service.				117	
Equipment (non-add)				(399)	
10. DESCRIPTION OF PROPOSED CONSTRUCTION					
Install computer aided design and drafting (CADD) equipment to be supplied by the Naval Laboratories Interactive Graphic Programs under the direction of the Director of Naval Laboratories. Equipment installation includes providing raised flooring, additional air conditioning, and electrical service in existing building space. This project is being initiated and sponsored by the Director of Navy Laboratories (DNL) to expedite the preparation of production documents and facilitate the communication of technological data among all Naval Laboratories.					

1 COMPONENT Navy		FY 1982 MILITARY CONSTRUCTION PROJECT DATA		2 DATE Dec 1981	
3 INSTALLATION AND LOCATION Naval Underwater Systems Center Newport Laboratory, Newport, RI			4 PROJECT TITLE Install Central Computer System		
5. PROGRAM ELEMENT 65862N	6 CATEGORY CODE 310-33	7. PROJECT NUMBER Z0833	8. PROJECT COST (\$000) 250		
9. COST ESTIMATES					
ITEM	U/M	QUANTITY	UNIT COST	COST (\$000)	
Install New Equipment Grounding System	LF	11,000	3.00	12	
New Power Distribution System	LF	6,000	5.00	30	
New Power Distribution/Conditioning Units	EA	6	15,000	90	
Misc. Equipment Connections & Terminations	LS	--	--	25	
15-Ton Computer Room A/C Units	EA	4	10,000	40	
Install 400-Hz MG Units	EA	2	3,000	6	
Upgrade Power Feeds & Switchgear	LS	--	--	15	
Line Filters	EA	24	1,000	24	
Misc. Cutting, Patching & Removals	LS	--	--	8	
TOTAL				250	
Equipment (Non-Add) figures not applicable					
10. DESCRIPTION OF PROPOSED CONSTRUCTION					
Provides removal of existing outdated computer system and associated wiring and support systems in Bldgs. 107 and 1176, and the installation of a new grounding system, power conditioning and distribution system, as well as augmenting the air conditioning distribution necessary to properly support the Laboratory's new Central Computer System to be installed in Bldgs. 107 and 1176 at the Newport Laboratory.					

1. COMPONENT Navy		FY 1982 MILITARY CONSTRUCTION PROJECT DATA		2. DATE Dec 1981	
3. INSTALLATION AND LOCATION Naval Underwater Systems Center New London Laboratory, New London, CT			4. PROJECT TITLE Install Central Computer System		
5. PROGRAM ELEMENT 65862N	6. CATEGORY CODE 310-33	7. PROJECT NUMBER Z0833	8. PROJECT COST (\$000) 205		
9. COST ESTIMATES					
ITEM	U/M	QUANTITY	UNIT COST	COST (\$000)	
Install New Grounding System	LF	3,000	3.00	9	
New Power Distribution System	LF	6,000	5.00	30	
New Power Distribution/Conditioning Units	EA	4	15,000	60	
Equipment Connection & Termination	LS	--	--	15	
Additional Environmental System	TON	15	2,000	30	
Extended Existing CO ₂ System	LS	--	--	15	
Install 400-Hz MG Units	EA	2	3,000	6	
Upgrade Power Feed & Switchgear	LS	--	--	20	
Line Filters	EA	16	1,000	16	
Misc. Cutting, Patching & Removals	LS	--	--	4	
TOTAL				205	
Equipment (Non-Add) figures not applicable					
10. DESCRIPTION OF PROPOSED CONSTRUCTION					
Provides for removal of existing outdated computer system and associated wiring and support systems in Bldg. 80, and the installation of a new grounding system, power conditioning and distribution system, as well as augmenting the air conditioning distribution necessary to properly support the Laboratory's new Central Computer System.					

1 COMPONENT Navy		FY 1982 MILITARY CONSTRUCTION PROJECT DATA		2 DATE Dec 1981	
3. INSTALLATION AND LOCATION Naval Underwater Systems Center New London Laboratory, New London, CT			4 PROJECT TITLE LBITS Sonar Control Room Mock-up, Bldg 80		
5. PROGRAM ELEMENT 65862N	6 CATEGORY CODE 310-34	7. PROJECT NUMBER Z0833	8. PROJECT COST (\$000) 200		
9. COST ESTIMATES					
ITEM		U/M	QUANTITY	UNIT COST	COST (\$000)
Install Sonar Control Room Mock-up in Existing Land Base Integrated Test Site (LBITS) Area		LS			200
Equipment (non-add)					(3000)
10 DESCRIPTION OF PROPOSED CONSTRUCTION					
The Land Based Integrated Test Site (LBITS) is a multi-function complex dedicated to support the surface ship anti-submarine warfare sonar systems. LBITS is used by these sonar systems for: (1) Verification and validation of operational software prior to introduction into the Fleet. (2) For the stand-alone and multi-system testing and integration into the AN/SQQ-89(V) sonar suites. (3) For the operation evaluation (OPEVAL) of the AN/SQQ-89(V)1 and (V)2. This project will provide a sonar control room mock-up with the necessary facilities supports required for OPEVAL of the AN/SQQ-89(V)1 and (V)2. This project will also create in LBITS the environment demanded by OPEVAL and at the same time the realism required for the training of sonar operators; for training of the fire control crews for the lead ships and for software life cycle support for each of the sonar systems.					

1 COMPONENT Navy		FY 19 ₈₃ MILITARY CONSTRUCTION PROJECT DATA		2 DATE Dec 1981	
3 INSTALLATION AND LOCATION Naval Underwater Systems Center Tudor Hill Laboratory, Bermuda			4 PROJECT TITLE Install Photovoltaic, Bermuda		
5. PROGRAM ELEMENT 65862N	6 CATEGORY CODE 811-XX	7. PROJECT NUMBER Z0833	8. PROJECT COST (\$000) 200		
9 COST ESTIMATES					
ITEM		U/M	QUANTITY	UNIT COST	COST (\$000)
Supporting Structure		LS	--	--	165
Interconnection of Panels & Controls		LS	--	--	15
Cabling Including Burial		LF	500	40.00	20
TOTAL					200
Equipment (non-add)					(500)
10. DESCRIPTION OF PROPOSED CONSTRUCTION					
Provides for the fabrication and installation of a supporting structure, mounting of panels and the wiring and interconnecting of a 50-KW photovoltaic system to provide for household power at the NUSC Tudor Hill Laboratory, Bermuda.					

DEPARTMENT OF DEFENSE, MILITARY
RESEARCH, DEVELOPMENT, TEST AND EVALUATION, NAVY
FLIGHT SIMULATOR PROGRAMS
(\$ in Thousands)

<u>PROGRAM ELEMENT/PROJECT</u>	<u>FY 1981</u> <u>ESTIMATE</u>	<u>FY 1982</u> <u>ESTIMATE</u>	<u>FY 1983</u> <u>ESTIMATE</u>	<u>FY 1984</u> <u>ESTIMATE</u>	<u>DESCRIPTIVE</u> <u>SUMMARY</u> <u>REFERENCE</u>
62757N Human Factors and Simulation Technology F57-526 Training Devices and Simulation	3,652	3,308	3,886	4,042	
63733N Training Device Technology					
W1198 Conventional Take Off and Landing (CTOL) Visual Technology Research Simulator (VTRS)	404	---	---	---	
W1199 Vertical Take Off and Landing (VTOL) Visual Technology Research Simulator (VTRS)	2,687	618	---	---	
W1200 Visual Technology Research Simulator (VTRS) Utilization	1,293	2,623	2,786	3,191	
W1201 Intermediate Hands-On Maintenance Simulators	289	---	---	---	
W1202 Integrated Maintenance Training System	333	510	603	---	
W1203 Individual Adaptive Training System	141	561	---	---	
W1204 Microcomputer Architecture for Trainer Systems	197	325	299	961	
W1205 Simulation for Selecting Aviation Trainers	237	---	---	---	
W1206 Automation of Part-Task Trainer	322	1,084	---	---	
W1207 Simulator Trainer Requirements for Automatic Test Equipments	72	---	---	---	
W1208 Computer Generated Imagery for Simulation	---	---	---	244	
W1209 Dynamic Scene Visual Display	---	---	597	1,315	
W1390 Multi-Spectral Image Simulation	---	124	438	783	
W1391 Helmet Mounted Display	---	2,105	2,676	1,363	

DEPARTMENT OF DEFENSE, MILITARY
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<u>PROGRAM ELEMENT/PROJECT</u>	<u>DESCRIPTIVE</u>	<u>FY 1981</u> <u>ESTIMATE</u>	<u>FY 1982</u> <u>ESTIMATE</u>	<u>FY 1983</u> <u>ESTIMATE</u>	<u>FY 1984</u> <u>ESTIMATE</u>	<u>SUMMARY</u> <u>REFERENCE</u>
W1663	Part-Task Training for Missile Envelope Recognition	---	---	---	198	
64703N	Training Devices Prototype Development					
W0291	Automated Air Intercept Control Trainer	504	---	---	---	
W0784	Simulator Avionics Maintenance Trainer	257	270	---	---	
W0788	Aviation Weapons System Simulator	576	---	---	---	
W1344	Fixed Pipper Gunnery Simulator	50	---	---	---	
W1345	Mobile Pipper Gunnery Simulator	384	722	---	---	
64714N	Air Warfare Training Devices					
W1110	CH-53E Trainer	3,044	---	---	---	
W1112	SH-60B Trainer *	<u>8,900</u>	<u>17,700</u>	<u>11,500</u>	<u>5,500</u>	
	TOTAL	<u>23,342</u>	<u>29,950</u>	<u>22,785</u>	<u>17,597</u>	

* Total Project funding includes development of Weapons Tactics Trainer equipments as well as development of the Operational Flight Trainer.

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