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STATISTICAL AND BIOGRAPHICAL LABORATORY/CENTER DATA, REVISION C

COMMANDER, SPACE AND NAVAL WARFARE
SYSTEMS COMMAND, AND
OFFICE OF THE CHIEF OF NAVAL RESEARCH
WASHINGTON, D.C.

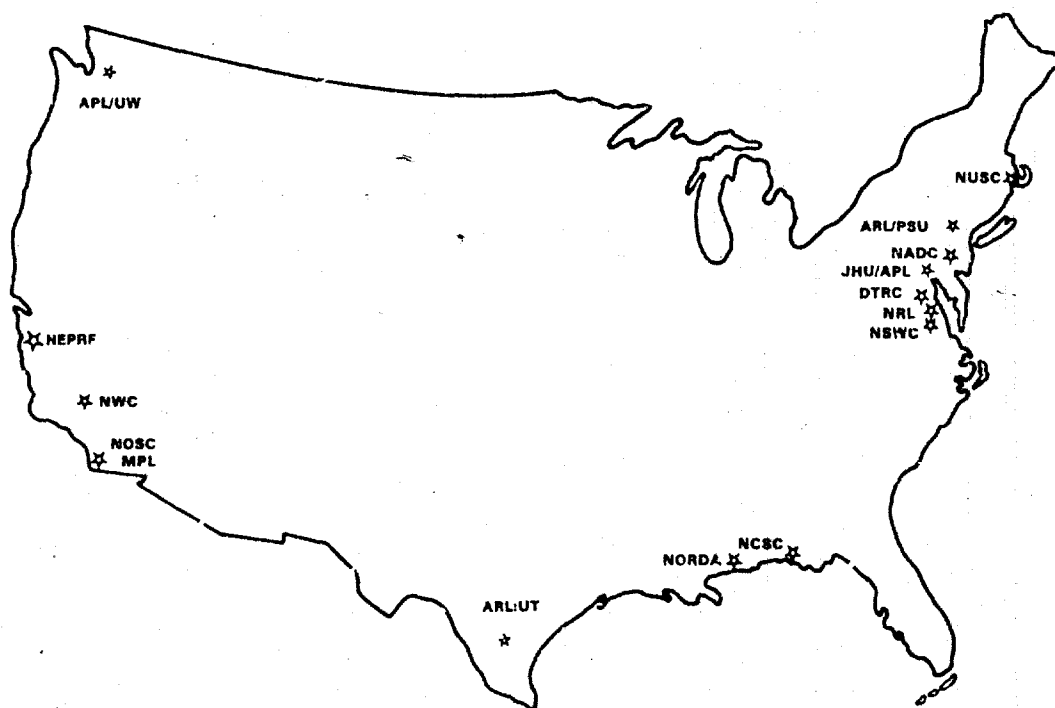


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THE NAVAL LABORATORIES/CENTERS

→ This document contains biographical and statistical data for the following organizations:

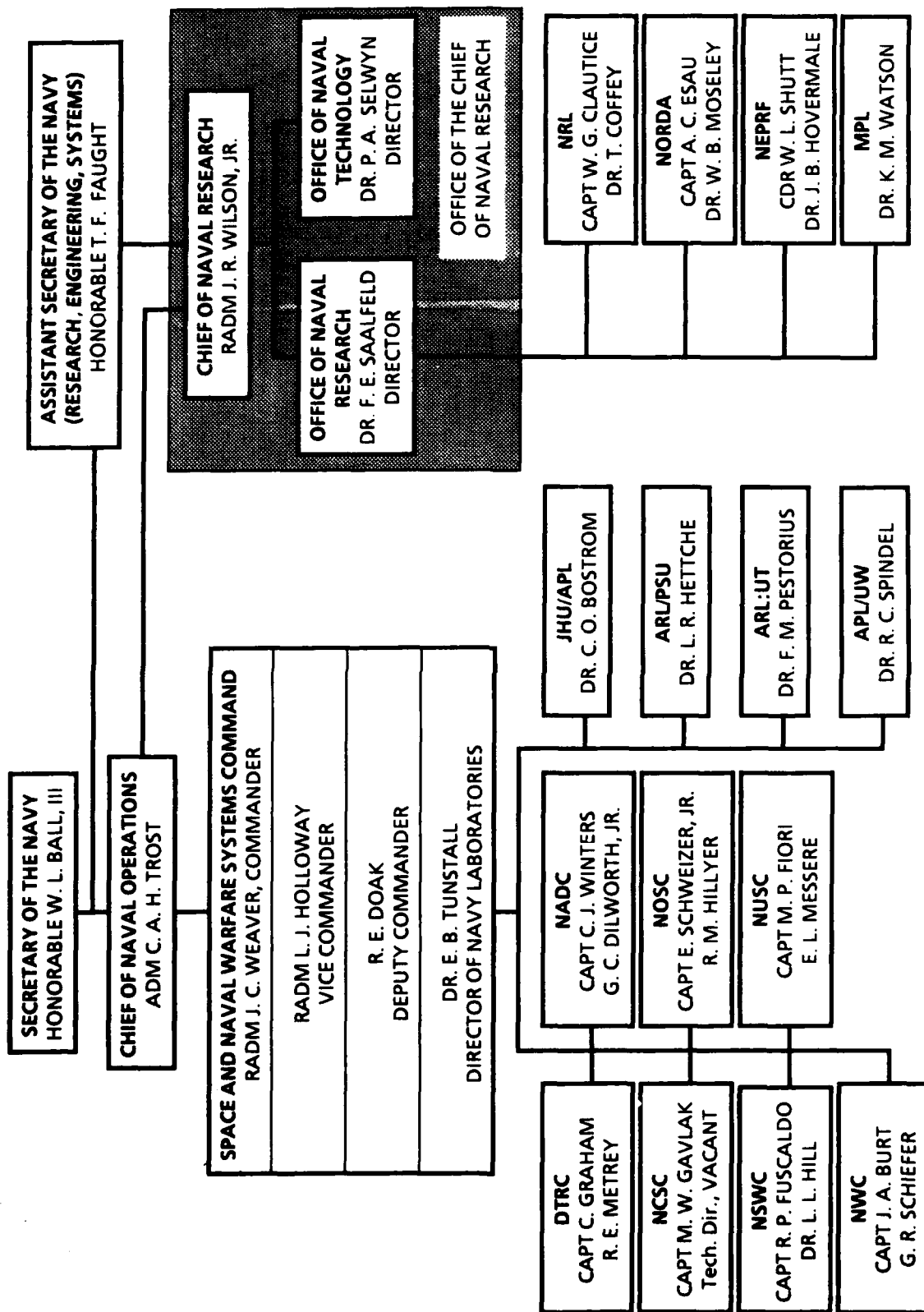
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OCTOBER 1988

**COMMANDER
SPACE AND NAVAL WARFARE SYSTEMS COMMAND**



REAR ADMIRAL JOHN C. WEAVER, USN

Rear Admiral John C. Weaver graduated from the U.S. Naval Academy in 1955 and earned his wings as a Naval Aviator in 1957. He served in Fighter Squadron 213 from 1957 to 1960, flying the F-4D Skyray and the F-3H Demon.

Rear Admiral Weaver received his B.S. degree in Aeronautical Engineering in 1962 and his M.S. degree in Aeronautical Electronics in 1963 from the Naval Postgraduate School. From 1963 to 1966 he served aboard USS *Ranger* (CVA 61). In 1966 he was assigned to the Navy F-111B/Phoenix Program Office at Aircraft Systems Division, Wright Patterson Air Force Base. He was then assigned to the Naval Air Systems Command's F-14/Phoenix Program from 1968 to 1973. In 1974 he attended the Industrial College of the Armed Forces.

Rear Admiral Weaver next served as Assistant Chief of Staff (Material) for Commander, Carrier Striking Force, Seventh Fleet, during the evacuation of Saigon and the Mayaguez Operation. In 1976 he reported to the Pacific Missile Test Center (PMTTC), Point Mugu, Calif. He assumed command of PMTTC in 1977.

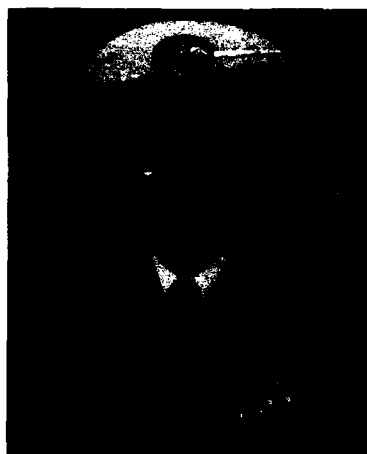
In 1980 Rear Admiral Weaver was designated Project Manager of the F/A-18 Aircraft Weapon System Project (PMA-265) at NAVAIR. He was selected for flag rank in 1981. From 1983 to 1985 he served as Assistant Chief of Staff (Material) for Commander, Naval Air Force, U.S. Atlantic Fleet.

Rear Admiral Weaver served in the Office of the Chief of Naval Operations (OP 51) as Director, Naval Aviation Maintenance Program Division, from 1985 to 1986, when he reported to the Space and Naval Warfare Systems Command as Vice Commander. He became Commander in June 1988.

Rear Admiral Weaver's personal awards include the Legion of Merit with third gold star in lieu of the fourth award, and the Meritorious Service Medal.

He is married to the former Joan Gatt. They have four children: Laurel, Bryce, Marley, and John. Ensign John Weaver graduated from the U.S. Naval Academy in 1987.

**VICE COMMANDER
SPACE AND NAVAL WARFARE SYSTEMS COMMAND**



REAR ADMIRAL LOWELL JOHN HOLLOWAY, USN

Rear Admiral Holloway is a native of Racine, Wisc. He entered the U.S. Navy through the NROTC program at the University of Wisconsin, Madison, Wisc., where he received his B.S. degree. His first tour was as Gunnery Officer aboard USS *Silverstein* (DE 534). Subsequent shipboard tours included service as recommissioning First Lieutenant aboard USS *Oklahoma City* (CLG 5), and as Weapons Officer aboard USS *Dale* (DLG-19).

Rear Admiral Holloway's shore duty assignments included the NROTC Unit, Iowa State University, as Naval Weapons Instructor; the Naval Postgraduate School, where he received his M.S. degree in Electrical Engineering; the Advanced Surface Missile System Project, Naval Ordnance Systems Command; and the Naval Ship Weapon Systems Engineering Station, Port Hueneme, Calif., as the Terrier/Talos Weapon System Department Head. During this period he completed the Program for Management Development, Harvard Graduate School of Business.

Rear Admiral Holloway served at various times in the Naval Sea Systems Command as Terrier/Talos Program Manager; Technical Director, Aegis Shipbuilding Project; Director, Combat System Architecture Program; Director, Combat System Engineering Group; Assistant Deputy Commander for AAW and Surface Warfare Systems; Assistant Deputy Commander for Combat System Engineering; and Deputy Chief for Combat Systems Engineering.

In August 1988 he assumed duties as Vice Commander, Space and Naval Warfare Systems Command.

Rear Admiral Holloway was designated an Ordnance Engineering Duty Officer in 1967 and an Engineering Duty Officer in 1974. He was selected for flag rank in 1984.

In 1974 he was awarded the Eli T. Reich Award for outstanding managerial and technical leadership at the Naval Ship Weapon Systems Engineering Station. He has also been awarded the Meritorious Service Medal, the Navy Commendation Medal, the National Defense Service Medal, and the Vietnam Service Medal with two stars.

Rear Admiral Holloway is married to the former Jean Knaup. They have two children: Cindy and Bryan.

**DIRECTOR OF NAVY LABORATORIES
SPACE AND NAVAL WARFARE SYSTEMS COMMAND**



EDWARD B. TUNSTALL

Dr. Edward B. Tunstall, a native of Charleston N.C., received his B.S. degree in Physics from Florida State University in 1964. During his last three undergraduate years, he participated in a work-study program at the Naval Coastal Systems Laboratory (NCSL). Upon graduation, he joined the technical staff of NCSL. He returned to graduate studies at Florida State University in 1966, and received his M.S. degree in Fluid Mechanics in 1967.

Dr. Tunstall then joined the staff of the Naval Undersea Center (NUC), San Diego, where he worked in hydrodynamic modeling and data reduction for a series of high-speed depressor trials conducted on the Navy's hydrofoil. Following completion of the trials, he entered Scripps Institution of Oceanography at the University of California, San Diego, earning his Ph.D. in Ocean Engineering in 1973.

Returning to the NUC staff, he was appointed Deputy Program Element Administrator for the exploratory development program in Undersea Target Surveillance in Washington, D.C. In 1974 he participated in an underwater acoustics exercise in the Mediterranean, following which he spent 3 months as a technical representative aboard AN/SQR-15 Towed Array Surveillance System (TASS) ships during their operational deployments.

Dr. Tunstall returned to NWC in 1975 to serve as the Program Manager for the Long-Range Acoustic Propagation Project (LRAPP). In 1977 he was selected to head the Environmental Acoustics Division of the newly established Naval Ocean Systems Center (NOSC), which was formed by merging NUC and the Naval Electronics Laboratory Center. During that time, he was appointed Chief Scientist for a 3-month Indian Ocean environmental acoustics exercise involving five ships.

In 1978 Dr. Tunstall accepted a 1-year assignment in Washington, D.C., serving as Deputy Technical Director, Undersea Surveillance Project Office, Naval Electronic Systems Command.

He returned to NOSC in 1979 as Head of the Surveillance Systems Department. He later became Head of the Integrated Tactical Surveillance Systems Program Office. In 1984 Dr. Tunstall was selected as Head of NOSC's Command and Control Department, directing the development of Navy command and control systems from concept formulation through implementation. He was appointed Technical Director, Naval Coastal Systems Center, Panama City, Fla., in August 1987.

Dr. Tunstall was appointed Director of Navy Laboratories effective 9 October 1988.

He is married to the former Tricia Fidler.

DAVID TAYLOR RESEARCH CENTER
BETHESDA, MD 20084-5000
(202) 227-2828 AV 287-2828

MISSION To be the principal Navy RDT&E center for naval vehicles and for providing RDT&E support to the U.S. Maritime Administration and the maritime industry.

PERSONNEL **Commander:** CAPT Clark Graham, USN Ext. 1515
Technical Director: Mr. Richard E. Metrey Ext. 1628

	Civilian	Military
Total On Board (10/88)	2,783	55
FTP On Board (10/88)	2,671	
FTP Scientists & Engineers (10/88)	1,412	

FUNDING (\$337,902 thousand, FY 1988) (NOR, including RCPs)

By Category	Percent	By Sponsor	Percent
6.1	2.4	SPAWAR	0.9
6.2	13.8	NAVAIR	0.9
6.3A	2.0	NAVSEA	59.1
6.3B	14.1	OCNR	16.6
6.4	23.6	Other Navy	18.0
6.5	7.2	Other	4.5
6.6	3.5	Total	100
O&MN	13.5		
APN	0.1		
WPN	0.1		
SCN	6.3		
OPN	6.0		
NIF	2.7		
Other Navy	0.4		
Other	4.3		
Total	100		

LEADERSHIP

ASSIGNMENTS Surface and Subsurface Vehicles
Logistics Support Systems Technology
Experimental Aircraft Aerodynamics

PROPERTY

Land: Owned 325 acres Leased 88 acres Buildings: RDT&E 1,728,000 ft ² Administrative 100,000 ft ² Other 292,000 ft ²	Acquisition Costs: Real Property \$ 80.5 million Equipment \$138.2 million
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DAVID TAYLOR RESEARCH CENTER



COMMANDER

CAPTAIN CLARK GRAHAM, USN

Captain Clark Graham, a native of New York City, graduated in 1964 from the U.S. Naval Academy, where he served as Regimental Commander and was selected as the Navy's first Trident Scholar.

Following assignments aboard the destroyers USS *Charles R. Ware* (DD 865) and USS *Richard E. Byrd* (DDG 23), Captain Graham attended the Massachusetts Institute of Technology (MIT), where he earned his M.S. and Ph.D. degrees in Mechanical Engineering.

In 1969 he was assigned to the Naval Ship Engineering Center, where he served as Deputy Ship Design Manager of the *Virginia*-class cruiser; Design Integration Manager of the destroyer USS *Spruance* (DD 963); and Director of the U.S.-Soviet Comparative Naval Architecture Study. While Captain Graham served aboard the cruiser USS *Gridley* (CG 21) as Engineer Officer in 1971, the ship passed the Propulsion Examining Board's Light Off Exam, the first ship in the Pacific Fleet to do so.

In 1972 Captain Graham returned to MIT as Associate Professor of Naval Construction and Naval Engineering.

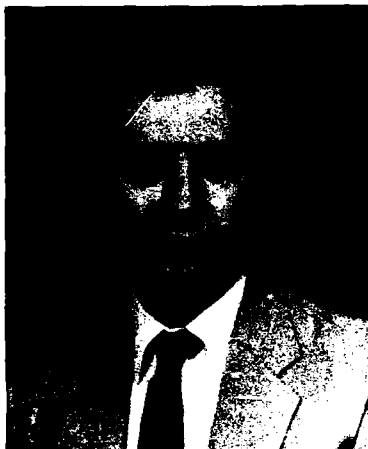
Subsequent duty included assignment as Assistant Technical Director for the Advanced Naval Vehicle Concepts Evaluation Study in the Systems Analysis Division (OP-96) of the Office of the Chief of Naval Operations.

From 1976 to 1979 Captain Graham was Nuclear Cruiser Project Officer at the Supervisor of Shipbuilding, Newport News, Va. During this tour he was responsible for the delivery of the USS *Mississippi* (CGN 40). He served the next 5 years as Ship Design Manager and Technical Director for the Navy's newest destroyer, the USS *Arleigh Burke* (DDG 51), in the Naval Sea Systems Command.

Before assuming command of David Taylor Research Center, Captain Graham was Professor of Naval Construction and Engineering at MIT, directing the curriculum for over 60 officers from the Navy, Coast Guard, and foreign countries. He is the lecturer in charge of two courses at the NAVSEA Institute and is a frequent lecturer at the Naval Postgraduate School and the Engineering Duty Officer School. He has published more than 20 articles on the subject of naval ship design and acquisition, and is an active member of the American Society of Naval Engineers, the Naval Institute, and the Society of Naval Architects and Marine Engineers.

Captain Graham has three children.

DAVID TAYLOR RESEARCH CENTER



TECHNICAL DIRECTOR

RICHARD E. METREY

Mr. Richard E. Metrey was born in Milwaukee, Wisc. He received his B.S. degree in Mechanical Engineering from Marquette University, Milwaukee, Wisc., and his M.S. degree, also in Mechanical Engineering, from George Washington University, Washington, D.C. Postgraduate studies included advanced mathematics at George Washington University, thermodynamics and heat transfer at the Massachusetts Institute of Technology, vibration and shock analysis at Princeton University, and law at Georgetown University.

Mr. Metrey entered government service in 1960 as a project engineer in the Ships Machinery Division of the former Bureau of Ships. He subsequently served in management positions involving Navy weapon R&D programs in the Naval Sea Systems and Naval Air Systems Commands and on the staff of the Naval Material Command.

From 1972 until 1977 he served as Program Manager for the Navy Advanced Prototyping Program in NAVSEA, initiating such programs as Vertical Launch, Seafire, Multimode Guidance, Advanced Surface-to-Air Missile (ASAM), and the Agile Beam Illuminator.

In 1977 he joined the Navy secretariat as Special Assistant for Combat Systems in the Office of the Assistant Secretary of the Navy (OASN) Research, Engineering, and Systems (RES), where he was responsible for Navy ship and aircraft combat systems from program initiation through production decision. In 1981 he became Director of Surface Warfare Programs in OASN (RES).

In June 1985 Mr. Metrey was appointed Deputy Assistant Secretary of the Navy (Surface Warfare). In this position, he was responsible for Navy surface ship programs, including launchers, fire-control systems, weapons, and sensors. He was the principal advisor to the Assistant Secretary of the Navy on matters pertaining to the Navy surface-warfare R&D and acquisition programs, and acted as the principal point of contact in the Navy for the Program of Naval Cooperation with the People's Republic of China.

Mr. Metrey became Technical Director of David Taylor Naval Ship R&D Center in June 1986.

He and the former Mary Sue Sonefeld are the parents of four sons.

NAVAL AIR DEVELOPMENT CENTER
WARMINSTER, PA 18974-5000
(215) 441-2000 AV 441-2000

MISSION To be the principal Navy RDT&E center for naval aircraft systems less aircraft-launched weapons systems.

PERSONNEL **Commander:** CAPT Curtis J. Winters, USN Ext. 2235
 Technical Director: Mr. Guy C. Dilworth, Jr. Ext. 3300

	Civilian	Military
Total On Board (10/88)	2,589	235
FTP On Board (10/88)	2,516	
FTP Scientists & Engineers (10/88)	1,526	

FUNDING (\$361,250 thousand, FY 1988) (NOR; including RCPs)

By Category	Percent	By Sponsor	Percent
6.1	1.4	SPAWAR	8.9
6.2	11.1	NAVAIR	52.4
6.3A	2.7	NAVSEA	7.2
6.3B	8.1	OCNR	13.0
6.4	28.8	Other Navy	14.4
6.5	2.8	Other	4.1
6.6	5.1	Total	100
O&MN	13.8		
APN	8.4		
WPN	1.3		
SCN	3.2		
OPN	4.8		
NIF	1.2		
Other Navy	2.2		
Other	5.1		
Total	100		

LEADERSHIP

ASSIGNMENTS	Air Warfare Analysis with NWC (AAW, ASUW, STRIKE) Air ASW Warfare Analysis Air Combat Systems Engineering and Integration with NWC Air Vehicles Air Vehicle-Related Human Factors	Aircraft, Surface Ship, and Submarine Navigation Systems Aircraft Crew Equipment and Life Support Air Command and Control Systems Aerial Targets (Subscale)
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PROPERTY

Land: Owned 839 acres	Acquisition Costs: Real Property \$ 54.4 million Equipment \$123.4 million
Buildings: RDT&E 867,000 ft ² Administrative 92,500 ft ² Other 444,600 ft ² (excl. housing)	

NAVAL AIR DEVELOPMENT CENTER



COMMANDER

CAPTAIN CURTIS J. WINTERS, USN

Captain Curtis J. Winters attended the University of Kansas as an NROTC Midshipman and received a bachelor's degree in Aeronautical Engineering there in 1963. He was commissioned that same year.

After designation as a Naval Aviator in 1964, Captain Winters was assigned to VP-8 at the Naval Air Station (NAS), Patuxent River, Md., where he participated in deployments to Sangley Point, Philippines and Keflavik, Iceland. In 1968 he reported to VP-31 at NAS, Moffet Field, Calif., to serve as a flight instructor in the P-3 aircraft.

Captain Winters received a master's degree in Aeronautical Engineering from the Naval Postgraduate School in 1971, and then joined the staff of Commander, Fleet Air Keflavik, Iceland, where he served in the Antisubmarine Warfare Command Center.

In 1973 Captain Winters reported to VP-24 at NAS, Jacksonville, Fla., making deployments to Keflavik, Iceland, and Sigonella, Sicily. In 1976 he was assigned to VX-1 at NAS, Patuxent River, Md., as Projects Officer. In 1978 he reported to VT-28 at NAS, Corpus Christi, Tex., as Executive Officer, and in 1979 he assumed command of VT-28.

Captain Winters' next assignment was on the staff of Commander, Seventh Fleet aboard USS *Blue Ridge* (LCC 19), operating from Yokosuka, Japan. In 1983, after attending the Industrial College of the Armed Forces for 1 year, he was assigned to Naval Air Systems Command Headquarters as Director, Plans and Programs Division. In 1986 he became Assistant to the Deputy Commander for Program Support. In July 1987, Captain Winters assumed command of the Naval Air Development Center.

Captain Winters' awards include the Meritorious Service Medal with gold star, the Air Medal with numeral two, the Navy Commendation Medal with gold star, and various campaign and area awards.

Captain Winters is married to the former Marian Louise Jun. They have four children: Christopher, Jeanne, Kevin, and Robert.

NAVAL AIR DEVELOPMENT CENTER



TECHNICAL DIRECTOR

GUY C. DILWORTH, JR.

Mr. Guy C. Dilworth, Jr., was born in Dancey, Ala. He received a bachelor's degree in Electrical Engineering from Tuskegee Institute and a master's degree in Electrical Engineering from Pennsylvania State University.

Mr. Dilworth served as an Aircraft Maintenance Officer, Strategic Air Command, from 1960 to 1962. He joined the Naval Air Development Center (NADC) in 1963 as a digital logic designer for VP, VS, and A-NEW projects. At NADC he served as Systems Engineer for computer-driven cathode-ray-tube display systems. He later became Head of the Displays and Control Branch of the Systems Analysis and Engineering Department. He then served as Project Engineer for the carrier-based ASW command and control system. Mr. Dilworth next became Manager of the Systems Readiness Division. As manager of this division, he directed weapons systems reliability and maintainability engineering, projects systems cost research and analysis activities, development of system integrated logistics support plans, and special Fleet readiness support projects. He subsequently was named Deputy Director and later Director, Software and Computer Directorate. In that capacity he directed programs involving tactical software for naval aircraft and ship-based systems, software research and development, algorithm and software processing, advanced signal processing and computer system architecture developments, and development of mass data storage and retrieval systems.

In April 1981 Mr. Dilworth was named Technical Director of the Naval Coastal Systems Center (NCSC). Under his leadership, NCSC's business base approximately tripled, its technical staff more than doubled, and several new RDT&E facilities were built.

He returned to NADC as Technical Director in January 1987.

Mr. Dilworth was the recipient of SES Bonus Awards for Exceptional Performance in 1982, 1983, 1984, 1986, and 1987. He received the Meritorious Executive Presidential Rank Award in 1985.

He is married to the former K. Jean Elliot. They have three children: Michael, Martin, and Janean.

NAVAL COASTAL SYSTEMS CENTER
PANAMA CITY, FL 32407-5000
(904) 234-4011 AV 436-4011

MISSION To be the principal Navy RDT&E center for mine and undersea countermeasures, special warfare, amphibious warfare, diving, and other naval missions that take place primarily in the coastal regions.

PERSONNEL **Commanding Officer:** CAPT Michael W. Gavlak, USN Ext. 4201
Technical Director: Vacant Ext. 4202

	Civilian	Military
Total On Board (10/88)	1,192	118
FTP On Board (10/88)	1,178	
FTP Scientists & Engineers (10/88)	606	

FUNDING (\$136,136 thousand, FY 1988)(NOR, including RCPs)

By Category	Percent	By Sponsor	Percent
6.1	4.2	SPAWAR	2.2
6.2	11.9	NAVAIR	15.2
6.3A	0.0	NAVSEA	54.8
6.3B	23.4	OCNR	9.0
6.4	8.0	Other Navy	16.3
6.5	2.2	Other	2.5
6.6	3.6	Total	100
O&MN	14.4		
APN	0.0		
WPN	0.1		
SCN	10.4		
OPN	14.1		
NIF	0.2		
Other Navy	4.8		
Other	2.7		
Total	100		

LEADERSHIP

ASSIGNMENTS	Undersea Countermeasures	Submarine Launchers (Countermeasures Unique)
	Mine Countermeasures	Special Warfare
	Torpedo and Sonar Countermeasures	Amphibious Warfare
	Ship/Airborne Mine Countermeasures	Diving and Salvage
	Combat System Integration	

PROPERTY

Land:	Acquisition Costs:
Owned 648 acres	Real Property \$66.2 million
	Equipment \$33.5 million
Buildings:	
RD&E 358,636 ft ²	
Administrative 42,503 ft ²	
Other 553,861 ft ²	

NAVAL COASTAL SYSTEMS CENTER



COMMANDING OFFICER

CAPTAIN MICHAEL W. GAVLAK, USN

Captain Michael W. Gavlak, a native of Cleveland, Ohio, received his commission as Ensign from the U.S. Naval Academy in 1960 and was designated a Naval Aviator the following year.

His first aviation assignment was with Airborne Early Warning Squadron 11, home-based at Naval Station Argentia, Newfoundland. While flying out of Keflavik, Iceland, Captain Gavlak became a member of the Century Club, flying over 100 missions on the North Atlantic Distant Early Warning line in the Super Constellation. From 1964 to 1966, while attached to Patrol Squadron 7 in Jacksonville, Fla., he served as a patrol plane commander in the SP2E/H "Neptune" to Rota, Spain and Sigonella, Sicily. In 1966 he joined Training Squadron 2 as a formation flight instructor.

Captain Gavlak joined Patrol Squadron 5 in Jacksonville in 1970, serving as NATOPS/Safety Department Head and as Assistant Maintenance Officer. As a P-3 Orion plane commander, he had return deployments to Rota and Sigonella, along with a detachment assignment to Lajes Air Force Base, Azores. He reached a personal milestone of 5,000 pilot hours on his last flight with Patrol Squadron 5. In 1976 he served as Executive Officer aboard USS *Marlin* (SST 2), and from 1978 to 1979 he commanded Patrol Squadron 40.

Captain Gavlak reported to Naval Air Systems Command in 1979 as the Advanced Development Project Officer for maritime patrol aircraft and antisubmarine warfare programs. Later he served as Director, Plans and Resources Division, and as Deputy to the Assistant Commander for Programs. Before reporting to the Naval Coastal Systems Center in 1986, Captain Gavlak was on special assignment as the commander of a contract administration support unit with the Defense Logistics Agency.

Captain Gavlak received his M.S. degree in Operations Research from the Naval Postgraduate School in 1970. In 1972, after an abbreviated tour as a student in the College of Naval Command and Staff, he joined the defense economics and decision-making faculty of the Naval War College. He attended the Industrial College of the Armed Forces from 1980 to 1981.

Captain Gavlak has been designated a Material Professional by the Secretary of the Navy. He is a proven subspecialist in antisubmarine warfare and plans and programs and he is a designated Weapons Acquisition Manager.

His awards include the Defense Superior Service medal, the Meritorious Service medal, and the Navy Commendation medal.

Captain Gavlak has four children.

NAVAL COASTAL SYSTEMS CENTER

TECHNICAL DIRECTOR

VACANT

NAVAL OCEAN SYSTEMS CENTER
SAN DIEGO, CA 92152-5000
(619) 553-1111 AV 553-1011

MISSION To be the principal Navy RDT&E center for command control, communications, ocean surveillance, surface- and air-launched undersea weapon systems, and submarine arctic warfare.

PERSONNEL **Commander:** CAPT Earle G. Schweizer, Jr., USN Ext. 3000
Technical Director: Mr. Robert M. Hillyer Ext. 3010

	Civilian	Military
Total On Board (10/88)	3,087	229
FTP On Board (10/88)	3,052	
FTP Scientists & Engineers (10/88)	1,582	

FUNDING (\$526,137 thousand, FY 1988) (NOR, including RCPs)

By Category	Percent	By Sponsor	Percent
6.1	5.4	SPAWAR	24.9
6.2	8.9	NAVAIR	2.2
6.3A	3.0	NAVSEA	26.5
6.3B	4.9	OCNR	11.0
6.4	16.4	Other Navy	21.2
6.5	2.9	Other	14.2
6.6	6.5	Total	100
O&MN	16.5		
APN	0.1		
WPN	3.5		
SCN	2.3		
OPN	9.0		
NIF	5.0		
Other Navy	1.3		
Other	14.3		
Total	100		

LEADERSHIP

ASSIGNMENTS	Multiplatform Command Control and Communications (C ³) Systems	Shipboard Internal Communications
	Multiplatform Combat Systems	Marine Biosciences
	Integration	Environmental Description and Prediction for Ocean Surveillance and C ³
	Ocean Surveillance(Electromagnetic/Electro-Optic/Acoustic Reconnaissance and Search)	Surface Ship ASW Fire Control
	Deep Ocean Engineering	Surface- and Air-Launched Torpedoes

PROPERTY

Land:	Acquisition Costs:
Owned 1,603 acres	Real Property \$ 68.8 million
Leased 664 acres	Equipment \$191.2 million
Buildings:	
RDT&E 1,392,656 ft ²	
Administrative 201,642 ft ²	
Other 205,530 ft ²	

NAVAL OCEAN SYSTEMS CENTER



COMMANDER

CAPTAIN EARLE G. SCHWEIZER, JR., USN

Captain Earle G. Schweizer, Jr., a native of San Diego, graduated from the U.S. Naval Academy in 1960. He was commissioned Ensign the same year and served his first tour of duty aboard USS *Bradford* (DD 545). He next served aboard USS *Henry W. Tucker* (DD 875) as Weapons Officer.

Captain Schweizer received his B.S. degree in Mechanical Engineering from the Naval Postgraduate School in 1966. From 1966 to 1969 he served as Chief Engineer aboard USS *Mahan* (DLG 11), spending two deployments in the Western Pacific and the Gulf of Tonkin. Captain Schweizer served as Commanding Officer of USS *Energy* (MSO 436) from 1969 to 1971, when he became a DD 963 Assistant Project Officer at Litton Ship Systems, Culver City, Calif. In 1972 he assumed additional duty as Resident Supervisor of Shipbuilding, Culver City.

From 1974 to 1976 Captain Schweizer was Executive Officer of the San Diego-based Amphibious Transport Dock USS *Juneau* (LPD 10). He next reported to USS *Caron* (DD 970) Precom Unit as Officer-in-Charge. From 1977 to 1979 he served as both Commissioning Commanding Officer and Commanding Officer aboard *Caron*.

Captain Schweizer graduated from National Defense University, Industrial College of the Armed Forces, in 1980 and received his M.S. degree in Administration from George Washington University the same year. He next reported to the NAVSEA Mini Warfare Project and served as AEGIS Fleet Introduction Division Director in the AEGIS shipbuilding project.

In 1984 Captain Schweizer assumed command of USS *Coronado* (AGF 11). As Sixth Fleet flagship from 1985 to 1986, *Coronado* twice conducted Eastern Mediterranean contingency operations and participated in four different periods of battle-group operation in the vicinity of Libya. *Coronado* received the Navy Unit Commendation for Exceptionally Meritorious Service.

Captain Schweizer assumed command of the Naval Ocean Systems Center in October 1986.

His decorations include the Meritorious Service Medal with gold star, the Navy Commendation Medal, the Navy Achievement Medal, the Navy Unit Commendation, and service medals from Vietnam and Korea.

Captain Schweizer is married to the former Margaret Navrkal. They have three children: Karen, Earle III, and Kristin.

NAVAL OCEAN SYSTEMS CENTER



TECHNICAL DIRECTOR

ROBERT M. HILLYER

Mr. Robert M. Hillyer was born in Sayre, Pa. He received his B.S. degree in Mechanical Engineering from the University of Idaho in 1957 and his M.S. degree in Mechanical Engineering from the University of California at Los Angeles in 1964. He completed an additional year of graduate study at UCLA in 1965 under a Weapon Control Systems Engineering (WEPCOSE) Fellowship.

Mr. Hillyer has served the Navy laboratory system since 1957. On active duty as a naval officer from 1957 to 1960, he was assigned to the Naval Ordnance Laboratory, Corona, as project engineer on safety-arming devices and contact fuzes for Sidewinder missiles. In the ensuing years, as a civilian in the Fuze Department at Corona, he conducted applied research programs on explosive trains, electric explosive devices, and a sea-launched satellite interceptor. He served as Branch Head and Assistant Division Head in the Fuze Department's System Analysis Division. In 1970, concurrent with the transfer of the Naval Ordnance Laboratory to the Naval Weapons Center, Mr. Hillyer became Head of the Fuze Development Division and later Head of the Fuze Department. In 1975 he was assigned as Head of the Resources and Technology Office, which was responsible for management of the Center's technology base program, long-range planning, and resource management. Upon reorganization of NWC in 1976, he became Laboratory Director/Deputy Technical Director. In January 1978, after 8 months as Acting Technical Director, Mr. Hillyer was selected as Technical Director. He was appointed Director of Navy Laboratories in July 1982, and was named Technical Director of the Naval Ocean Systems Center in July 1983.

Mr. Hillyer's awards include the Navy Holloway Plan Fellowship, the Naval Ordnance Laboratory Fellowship, and the Navy WEPCOSE Fellowship. In 1982 he was awarded the rank of Distinguished Senior Executive by the President. He was presented the Distinguished Civilian Service Award in 1983. In 1987 Mr. Hillyer received the Meritorious Senior Executive Presidential Rank Award.

Mr. Hillyer is married to the former M. Luverne Glynn. They have four children: Regina, Linda, Michelle, and Thomas.

NAVAL SURFACE WARFARE CENTER
DAHLGREN, VA 22448-5000
(703) 663-8531 AV 249-8531

MISSION To be the principal Navy RDT&E center for surface ship weapons systems, ordnance, mines, and strategic systems support.

PERSONNEL **Commander:** CAPT Robert P. Fuscaldo, USN Ext. 8101
Technical Director: Dr. Lemmuel L. Hill Ext. 8103

	Civilian	Military
Total On Board (10/88)	5,141	116
FTP On Board (10/88)	4,978	
FTP Scientists & Engineers (10/88)	2,555	

FUNDING (\$682,914 thousand, FY 1988) (NOR, including RCPs)

By Category	Percent	By Sponsor	Percent
6.1	1.0	SPAWAR	3.3
6.2	6.5	NAVAIR	7.4
6.3A	1.6	NAVSEA	45.5
6.3B	10.2	OCNR	8.6
6.4	13.6	Other Navy	25.3
6.5	4.8	Other	9.9
6.6	4.2	Total	100
O&MN	14.4		
APN	1.6		
WPN	3.9		
SCN	16.3		
OPN	8.6		
NIF	0.5		
Other Navy	2.6		
Other	10.2		
Total	100		

LEADERSHIP

ASSIGNMENTS	
Surface Ship Combat Systems Engineering and Integration	Navy Strategic Systems Targeting and Fire Control
Surface Warfare Analysis	Mines
Surface Ship Electromagnetic/Electro-Optic Reconnaissance Search Systems	Nuclear Weapons Effects
Surface Ship Gun and Missile Systems	Surface Ship Biological and Chemical Warfare Systems
Mine, Torpedo, Projectile and Warheads	Directed Energy Weapons Systems
Surface Ship Electronic Warfare	Explosives (principally research)
	Mine, Torpedo, and Projectile Fuzes

PROPERTY

Land:		Acquisition Costs:	
Owned/Leased	5,084 acres	Real Property	\$132.8 million
		Equipment	\$157.7 million
Buildings:			
RDT&E	1,616,610 ft ²		
Administrative	304,521 ft ²		
Other	1,176,514 ft ²		

NAVAL SURFACE WARFARE CENTER



COMMANDER

CAPTAIN ROBERT P. FUSCALDO, USN

Captain Robert P. Fuscaldo entered the U.S. Navy through the NROTC program at the University of Notre Dame, where he earned his B.S. degree in Chemical Engineering. He is also a graduate of the Naval Postgraduate School (Ordnance Engineering) and the Industrial College of the Armed Forces.

Captain Fuscaldo reported to the Naval Surface Warfare Center from the Naval Sea Systems Command's Aegis Shipbuilding Program (PMS-400), in which he served as Deputy Program Manager. He is a line officer material professional.

Captain Fuscaldo has served as Director of Ordnance of the Naval Weapons Support Center, Crane, Ind.; Assistant for Weapons Systems at the Naval Surface Weapons Center, Dahlgren, Va.; and Executive Assistant to the Commander, Naval Sea Systems Command.

His shipboard service was spent aboard destroyers, auxiliaries, amphibious ships, and an aircraft carrier. He was the Assistant Chief of Staff for Operations to Commander, Surface Group, Western Pacific. He also served on river patrol boats in Vietnam.

Captain Fuscaldo has been awarded the Bronze Star with Combat V, the Meritorious Service Medal with two gold stars, the Navy Commendation Medal with gold star, the Combat Action Ribbon, the Presidential Unit Citation, three Navy Unit Citations, and various service and campaign ribbons.

He is married to the former Barbara Bond. They have four children: Jason, Elizabeth, Jared, and Robert Joseph.

NAVAL SURFACE WARFARE CENTER



TECHNICAL DIRECTOR

DR. LEMMUEL L. HILL

Dr. Lemmuel L. Hill, a native of Ithaca, N.Y., served in the Navy from 1950 to 1955. He received his B.S. degree in Physics from Rensselaer Polytechnic Institute in 1959.

From 1959 to 1967, when he received his Ph.D. degree in Nuclear Theory from the Catholic University of America, Washington, D.C., Dr. Hill worked in the field of aerophysics at the Naval Surface Weapons Center (NSWC), principally in the area of reentry wake properties utilizing various shock tube, shock tube wind tunnel, and ballistics range facilities. At NSWC Dr. Hill became Head of the Nuclear Physics Branch in 1968 and Head of the Physics Research Division in 1973. In 1974 he served as Assistant to the Head of the Underwater Weapons Department.

In 1975 he served as Science Advisor to Commander, Naval Surface Forces, Atlantic, in Norfolk, Va. He then returned to NSWC as Head of the Radiation Physics Division. In 1977 Dr. Hill was selected to head the Research and Technology Department at the Center's White Oak Laboratory. In 1979 he was transferred to serve as Head of the Weapons Systems Department at the Dahlgren Laboratory.

From 1980 to 1983 Dr. Hill served as Technical Director of the Office of Naval Technology, Naval Material Command, where his responsibilities included management of the Navy Exploratory Development program and the Navy Industrial Research and Development program. He was named Technical Director of NSWC in May 1983.

Dr. Hill's recent awards include the Presidential Award for Meritorious Executive Service (1982) and the Navy Superior Service Award (1983).

Dr. Hill is married to the former Suzanne Kennedy. They have four children: Doug, Lee, Barry, and Ann.

NAVAL UNDERWATER SYSTEMS CENTER
NEWPORT, RI 02841-5047
(401) 841-2311 AV 948-2311

MISSION To be the principal RDT&E center for submarine warfare and submarine weapon systems.

PERSONNEL **Commander:** CAPT Mario P. Fiori, USN Ext. 3344
Technical Director: Mr. Earle L. Messere Ext. 4572

	Civilian	Military
Total On Board (10/88)	3,523	91
FTP On Board (10/88)	3,478	
FTP Scientists & Engineers (10/88)	2,025	

FUNDING (\$598,047 thousand, FY 1988 (NOR, including RCPs)

By Category	Percent	By Sponsor	Percent
6.1	0.6	SPAWAR	3.9
6.2	5.8	NAVAIR	13.4
6.3A	1.3	NAVSEA	66.2
6.3B	6.4	OCNR	7.0
6.4	21.8	Other Navy	8.8
6.5	7.7	Other	0.7
6.6	1.8	Total	100
O&MN	19.4		
APN	0.1		
WPN	11.3		
SCN	6.1		
OPN	13.3		
NIF	0.4		
Other Navy	1.8		
Other	2.2		
Total	100		

LEADERSHIP ASSIGNMENTS

Submarine Warfare and Analysis	Submarine Combat Control Systems
Submarine Combat Systems	Submarine Unique Communications Systems
Engineering and Integration	Submarine Launchers (Torpedo Tube)
Submarine and Surface Ship	Submarine Launched Torpedoes
Acoustic Reconnaissance and	Submarine Unique ASW Tactical
Search Systems (Mobile Sonar)	Missile Systems
Submarine Electromagnetic/Electro-optic	Underwater Acoustics for System
Reconnaissance and Search Systems	Performance Prediction
Submarine Electronic Warfare and Systems	Subsurface Target Simulators
Submarine Command and Control Systems	Undersea Range Development and Operation

PROPERTY

Land:
Owned/Leased 1,372 acres

Acquisition Costs:
Real Property \$103.0 million
Equipment \$ 67.1 million

Buildings:
RDT&E 1,324,299 ft²
Administrative 333,805 ft²
Other 859,805 ft²

NAVAL UNDERWATER SYSTEMS CENTER



COMMANDER

CAPTAIN MARIO P. FIORI, USN

Captain Mario P. Fiori assumed command of the Naval Underwater Systems Center in April 1987.

Captain Fiori, born in Frankfurt, West Germany, immigrated to the United States in 1948 and was raised in Brooklyn, New York. He graduated from the U.S. Naval Academy in 1963. Captain Fiori's first duty assignment was aboard the diesel submarine USS *Tench* (SS 417), where he qualified in submarines.

In 1964 Captain Fiori was assigned as a Naval Advanced Education (Burke) Program student at the Massachusetts Institute of Technology (MIT), from which he received a master's degree in Mechanical Engineering, as well as in Nuclear Engineering. He received his Ph.D. degree in Nuclear Engineering from MIT in 1968.

In 1969 Captain Fiori reported to the nuclear submarine USS *Pargo* (SSN 650). Forty-four months later he reported to the Office of the Chief of Naval Operations, Washington, D.C., and was assigned to the Operations Analysis Division (OP-96) as a submarine system analyst. His next assignment was to the Federal Energy Office as the Department of Defense liaison officer during the Arab oil embargo crisis of 1973-1974.

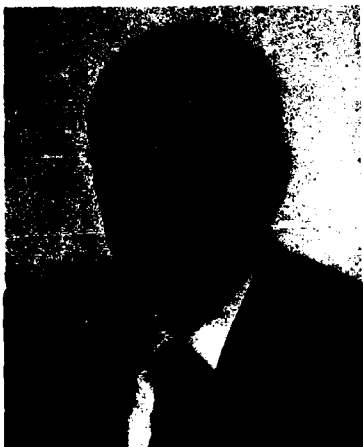
Captain Fiori reported as the Executive Officer of the Fleet ballistic missile submarine USS *George Washington Carver* (SSBN 656) (blue) in 1975, and in 1979 he assumed command of USS *Spadefish* (SSN 668). His 39-month command tour included three major deployments: a 5-month Mediterranean deployment, a 4-month independent operation, and a 3-month Submarine Ice Exercise. The highlight of the last deployment was the surfacing of the USS *Spadefish* at the North Pole.

In June 1983 Captain Fiori reported to Washington, D.C., as the military assistant to the President's Science Advisor. Captain Fiori commanded Submarine Squadron 4 in Charleston, S.C., from June 1985 until he assumed his current assignment.

Captain Fiori has been decorated with the Defense Superior Service Medal, the Legion of Merit with two gold stars, the Joint Service Commendation Medal, and the Navy Commendation Medal with two gold stars.

He and his wife, Susan, have three daughters: Christina, Alison, and Katherine.

NAVAL UNDERWATER SYSTEMS CENTER



TECHNICAL DIRECTOR

EARLE L. MESSERE

Mr. Earle L. Messere received his B.S. degree in Engineering Mathematics from the University of Rhode Island in 1956 and his M.S. degree in Aeronautics and Astronautics from the Massachusetts Institute of Technology in 1964. He continued graduate studies in control systems and electrical engineering at Rensselaer Polytechnic Institute and the University of Connecticut. He holds a master's degree in Public Administration from the University of Northern Colorado.

Mr. Messere served in the U.S. Army as a Second Lieutenant in the 20th Engineering Battalion, U.S. Army Corps of Engineers. He was subsequently associated with the Research Department of United Aircraft Corp. as an analytical engineer and later was a senior systems engineer with General Dynamics Corp.

In 1961 Mr. Messere became an engineer in the Propulsion Division of the Naval Underwater Ordnance Station (NUOS), a forerunner of NUSC's Newport Laboratory. His subsequent positions at NUSC (later renamed Naval Underwater Weapons Research and Engineering Station (NUWRES)) included Head, Controls and Guidance Section; Head, Exploratory Research and Development Branch; and Chief, Fire Control and Systems Division.

Mr. Messere became Head of NUSC's Combat Control Systems Department in 1970, following the establishment of the Center. He was named Deputy Director in 1980 and became Technical Director in April 1982.

His awards include the NUWRES award for Excellence in the Area of Engineering and Science, the NUSC Technical Director's Award in Excellence, and the Knowles Award (Silver Medal) from the American Defense Preparedness Association. He is also the recipient of the 1982 Admiral Charles B. Martell Technical Excellence Award presented by the National Security Industrial Association ASW Committee. In 1984 Mr. Messere was awarded an honorary Doctor of Engineering degree from Southeastern Massachusetts University. Mr. Messere is the recipient of the 1985 Meritorious Executive Rank Award and in 1986 received the national Roger W. Jones Award for technical and managerial achievements at NUSC by the College of Public and International Affairs of American University.

In 1982 Mr. Messere chaired a special Naval Material Command Research and Development Centers Mission Review Panel. He currently serves as a trustee on the University of Rhode Island Foundation and is a member of the university's Marine Program Advisory Council and its College of Engineering Advisory Council. He is also a member of the Advisory and Strategic Planning Committee for the Rhode Island Partnership for Science and Technology.

Mr. Messere and his wife Barbara have three children: Carolyn, Stephen, and Suzanne.

NAVAL WEAPONS CENTER
CHINA LAKE, CA 93555-6001
(619) 939-4113 AV 437-4113

MISSION To be the principal Navy RDT&E center for air warfare systems (except antisubmarine warfare systems) and missile weapons systems, and the national range/facility for parachute test and evaluation.

PERSONNEL **Commander:** CAPT John A. Burt, USN Ext. 2201
 Technical Director: Mr. Gerald R. Schiefer Ext. 3409

Civilian Military

Total On Board (10/88) 5,100 496
 FTP On Board (10/88) 4,949
 FTP Scientists & Engineers (10/88) 1,833

FUNDING (\$719,591 thousand, FY 1988) (NOR, including RCPs)

By Category	Percent	By Sponsor	Percent
6.1	0.9	SPAWAR	1.0
6.2	3.5	NAVAIR	66.4
6.3A	0.5	NAVSEA	9.0
6.3B	10.9	OCNR	7.3
6.4	16.7	Other Navy	10.2
6.5	10.4	Other	6.1
6.6	4.0	Total	100
O&MN	8.7		
APN	9.9		
WPN	13.4		
SCN	0.0		
OPN	3.3		
NIF	0.2		
Other Navy	3.9		
Other	13.7		
Total	100		

LEADERSHIP ASSIGNMENTS

Air Warfare Analysis with NADC (AAW, ASUW, STRIKE) Air Combat Systems Engineering and Integration With NADC Missiles and Missile Subsystems Aircraft Launched Free-Fall Weapons Aircraft Electronic Warfare Range Development and Operation (Air-to-Air, Air-to-Surface and Surface-to-Air Weapons; Air Electronic Warfare; and Parachute Systems)	Explosives (principally scale-up) Missile and Free-Fall Weapon Fuzing and Warheads Aerial Targets (full scale) Aerodynamic Deceleration (Parachute Systems) and Components Aircraft and Missile Nonnuclear Survivability and Vulnerability
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PROPERTY

Land:
 Owned/Leased 1,127,267 acres

Acquisition Costs:

Real Property \$285.7 million
 Equipment \$165.9 million

Buildings:
 RDT&E 2,240,910 ft²
 Administrative 201,551 ft²
 Other 2,908,456 ft²

NAVAL WEAPONS CENTER



COMMANDER

CAPTAIN JOHN A. BURT, USN

Captain John A. Burt, a native of Annapolis, Md., graduated from the U.S. Naval Academy in 1965 and was designated a Naval Aviator in 1967. Captain Burt's first flying assignment was with Attack Squadron 97 at NAS Lemoore. Following a combat deployment to Southeast Asia aboard USS *Constellation* (CVA 64), he reported to the Naval Postgraduate School, where he earned his M.S. degree in Aeronautical Engineering in 1971.

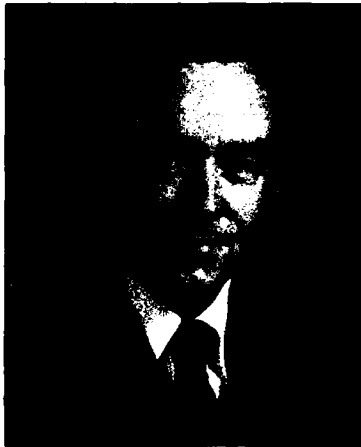
After refresher training flying the A-7 FRG aircraft in Attack Squadron 122, Captain Burt reported to Attack Squadron 146, flying the A-7E aircraft. With Attack Squadron 146, he made two more deployments to Southeast Asia aboard the *Constellation*, flying combat and noncombat missions. During this tour, Captain Burt served as Aircraft Maintenance Officer for 2 years and Operations Officer for 6 months.

Captain Burt was an instructor in Aeronautics and Associate Chairman of the Aerospace Engineering Department at the U.S. Naval Academy from 1974 to 1977, during which time he was designated an Aeronautical Engineering Duty Officer. After graduating from the Program Management Course at the Defense Systems Management College in 1977, Captain Burt reported to Naval Air Systems Command as the Weapons Integration Officer for the F/A-18 aircraft. He held the High-Speed Antiradiation Missile (HARM) Class Desk at NAVAIR from 1979 until 1980, when he reported to the Ministry of Defense, Procurement Executive, London, as the F-402 Engine Technical Representative from NAVAIR. During this 3-year assignment, Captain Burt served as U.S. Cochairman of the Pegasus Engine Joint Control Board. He returned to Washington in 1983 as Head of the Large Turbine Engine Branch at NAVAIR. From 1984 to 1985 Captain Burt served as Executive Assistant to the Commander, NAVAIR. He served as Program Coordinator for Support Aircraft and Weapon Systems Managers at NAVAIR before assuming command of the Naval Weapons Center in August 1986.

Captain Burt's awards include the Meritorious Service Medal, the Air Medal (with bronze star and Numeral 11), the Navy Commendation Medal (two awards with combat distinguishing device), and other unit and individual citations and campaign ribbons.

He is married to the former Mary Mechesney. They have three children: John, Heather, and Kathryn.

NAVAL WEAPONS CENTER



TECHNICAL DIRECTOR

GERALD R. SCHIEFER

Mr. Gerald R. Schiefer was born in Zion National Park, Utah. He came to China Lake in 1960 following his graduation from the University of Utah with a B.S. degree in Electrical Engineering. His first assignment as a junior professional (JP) was to the Supersonic Naval Ordnance Research Track (SNORT). His technical work with weapons began years earlier, however, when he was a fire-control instructor in the Army.

Upon completing his JP tour, Mr. Schiefer joined the Shrike missile team as a project engineer. In this capacity he helped design the control-section electronics, telemetry systems, and test set for the Shrike. In 1963 he was given the responsibility for coordinating the Cuban-Crisis-inspired Early Shrike Effort (ESE) test and evaluation. He became Head of the Shrike Test and Evaluation Group the following year. During the Vietnam War, Mr. Schiefer made five trips to Vietnam and Southeast Asia to provide Shrike support to the Fleet and consultation on defense suppression.

In 1970 Mr. Schiefer was appointed Head of the new HARM Program Office. His work on this program was recognized with the Michelson Laboratories Award for Engineering in 1974.

From 1975 to 1976 Mr. Schiefer served as Science Advisor to RAdm. P. R. Monroe, Commander, Operational Test and Evaluation Force, Norfolk, Va. Upon Mr. Schiefer's return to China Lake, he was appointed Associate Department Head of the Electronic Warfare Department and, subsequently, Head of the Electronic Warfare Department. His guidance led to the continued development of the NWC EWTES Facility and its recognized excellence, both as a full-scale test and evaluation facility and as a training and tactics development facility. During this time, Mr. Schiefer was awarded the Center's highest award for individual achievement, the L.T.E. Thompson Award.

In 1981 Mr. Schiefer assumed the duties of Associate Technical Director and Head of the Test and Evaluation Directorate. He became the Deputy Technical Director/Laboratory Director of the Naval Weapons Center in 1982. Mr. Schiefer became NWC's Technical Director in May 1986.

Mr. Schiefer received the Navy Superior Civilian Service Award in 1985 and was awarded the rank of Meritorious Executive in 1987.

He and his wife, the former Loretta McArthur, have three children: Heidi, Scott, and Charles.

**THE JOHNS HOPKINS UNIVERSITY
APPLIED PHYSICS LABORATORY
LAUREL, MD 20707
(301) 953-5000**

MISSION To provide essential engineering, research, development, test, and evaluation capabilities in support of programs to improve the efficiency and assure the availability of current and future Navy strategic and tactical forces, and to conduct related scientific and technical programs on behalf of other military and civilian agencies of the government.

PERSONNEL Director: Dr. Carl O. Bostrom Ext. 6050
Total On Board (10/88) 2,818
FTP Scientists & Engineers (10/88) 1,617

FUNDING (Total Navy—\$293,478 thousand; Total—\$416,439 thousand, GFY 1988)

Navy Funding		Total Funding	
By Category	Percent	By Sponsor	Percent
6.1.....	1	NAVSEA	24
6.2.....	1	NAVAIR.....	5
6.3.....	31	SPAWAR	7
6.4.....	18	SSPO.....	18
6.5.....	1	Other Navy	16
6.6.....	10	Other	30
O&MN	21		
Other	17	Total	100

LEADERSHIP ASSIGNMENTS

FBM Systems and Related Command,
Control and Communication Systems
Survivability of FBM Submarine
Space Systems and Instruments for
Precision Tracking, Location, and
Navigation Systems
Guided Missile System Design
Shipboard Combat Systems

Battle Group Level Warfare Systems and
Evaluation of Tactical C³ Systems
Technical Intelligence Information
Evaluation
Simulations, Models, and Operations
Analysis Techniques
Other Related Research and Technology
Development

PROPERTY Land:
Owned/Leased 365 acres

Acquisition Costs:
Real Property \$ 67.7 million
Equipment \$168.3 million

Buildings:
Laboratories 261,968 ft²
Offices 273,043 ft²
Computing Facilities 92,105 ft²
Other 585,062 ft²

**THE JOHNS HOPKINS UNIVERSITY
APPLIED PHYSICS LABORATORY**



DIRECTOR

DR. CARL O. BOSTROM

Although he was trained in nuclear physics, Dr. Carl O. Bostrom, Director of The Johns Hopkins University Applied Physics Laboratory, has spent his scientific career in space physics. An experimental physicist, he designed a variety of scientific instruments for studying energetic particles in the space environment. These instruments have been included on some 27 Navy and NASA spacecraft. Dr. Bostrom served as Project Scientist for four Navy research satellites associated with the development of the Transit navigation system. He has been principal investigator for several NASA-sponsored experiments.

Among the scientific results reported in Dr. Bostrom's 60 published papers are the first observations of low-energy solar protons in the earth's polar regions; the first long-term study of the stability of the inner Van Allen belt; and measurement of the lifetimes of energetic electrons in the artificial radiation belt produced by the Starfish high-altitude nuclear burst in 1962. In recent years, Dr. Bostrom managed the development of a complex instrument, flown aboard the Voyager spacecraft, for measuring the particle environments of the outer planets.

Dr. Bostrom, a native of Port Jefferson, N.Y., served in the Army from 1950 to 1952. He received a B.S. degree in Physics from Franklin and Marshall College, Lancaster, Pa., in 1956. Until 1960 he was a graduate student at Yale University, from which he received both an M.S. degree (1958) and Ph.D. degree (1962) in Physics. Dr. Bostrom joined the Applied Physics Laboratory in September 1960 and led the space physics program from 1964 to 1974. He was appointed Chief Scientist of the Space Department in 1974, Associate Department Head in 1978, and in 1979 held concurrent positions as Head of the Space Department and Deputy Director of the Laboratory. He became Laboratory Director in 1980.

Dr. Bostrom received the Air Force Medal for Exceptional Civilian Service in recognition of distinguished performance as a member of its advisory board from 1983-1987. He is chairman of the Defense Intelligence Agency Scientific Advisory Committee and a member of the President's Committee on the National Medal of Science.

Dr. Bostrom and his wife, the former Sara Hertzog, have three children.

**APPLIED RESEARCH LABORATORY
PENNSYLVANIA STATE UNIVERSITY
STATE COLLEGE, PA 16804
(814) 865-6531**

MISSION To serve as the lead laboratory for research and development in the guidance and control of undersea weapons; provide corporate memory, research, development, and technical expertise in the area of advanced, closed-cycle thermal propulsion systems for undersea weapons; provide research, development, and expertise in the area of propulsion technology, hydrodynamics, and hydroacoustics for undersea vehicles and weapons; and provide research and development in materials and manufacturing science in support of the above areas.

PERSONNEL Director: Dr. L. R. Hettche Ext. 6343

Total On Board (10/88) 582
Scientists and Engineers (10/88) 292

FUNDING (\$39,160 thousand, FY 1988)

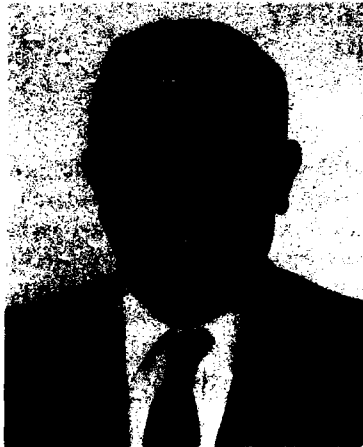
By Category	Percent	By Sponsor	Percent
6.1	2	NAVSEA	44
6.2	31	OCNR	20
6.3	33	Other Navy	22
6.4	16	Other	14
6.6	8		
Other Navy	8	Total	100
Other	2		
Total	100		

LEADERSHIP ASSIGNMENTS

Advanced Guidance and Control Concepts and Systems
Advanced Thermal Propulsion Concepts and Systems
Advanced Compound Propulsor Technology
Advanced Shipboard Turbomachinery Concepts and Systems
Hydrodynamic and Hydroacoustic Analysis and Testing
Materials and Manufacturing Science

PROPERTY	Land:	Acquisition Costs:
	Navy Owned, 2 acres University Leased, 7 acres	Real Property \$ 7.4 million Equipment \$24.1 million
	Buildings:	
	RDT&E 83,890 ft ²	
	Administrative 6,806 ft ²	
	Other 83,867 ft ²	

**APPLIED RESEARCH LABORATORY
PENNSYLVANIA STATE UNIVERSITY**



DIRECTOR

DR. L. RAYMOND HETTCHÉ

Dr. L. Raymond Hettche, a native of Baltimore, Md., received a bachelor's degree in Mathematics and Engineering from Bucknell University, Lewisburg, Pa. He entered a graduate program at Carnegie-Mellon University, Pittsburgh, Pa., as a national Tau Beta Pi Fellow and received his M.S. and Ph.D. degrees in Engineering from that school in 1965.

Following graduate school, Dr. Hettche held a faculty position in the College of Engineering, Rutgers University. He then became a National Research Council Research Associate at the National Bureau of Standards, Washington, D.C. In 1968 he joined the Naval Research Laboratory (NRL) as a consultant in engineering mechanics, and advanced to the position of Superintendent, Material Science Division. During his research career at NRL, Dr. Hettche wrote numerous technical papers and reports on dynamic deformation and fracture of metals and the thermomechanical response of materials to pulsed radiated heating. These papers represent some of the most significant research contributions in these areas to date and are directly applicable to critical Navy systems, including ships, submarines, ballistic missiles, and satellites.

In 1981 Dr. Hettche became director of Penn State's Applied Research Laboratory. In this capacity, he is the chief academic administrator of the Laboratory, reporting through the office of Vice President for Research and Dean of the Graduate School. He is responsible for directing the Laboratory's efforts in concurrence with the mission of the University and with the goals of the Navy's undersea technology base.

Dr. Hettche was a charter member of the Senior Executive Service and currently is a member of the American Society of Mechanical Engineers, the Acoustical Society of America, Sigma Xi, and the American Defense Preparedness Association. He has received the Recognition of Achievement Award from the Secretary of the Navy, as well as the Senior Executive Service Award.

Dr. Hettche is married to the former Patricia Durkan. They have four children: Lisa, Kathy, Matt, and Craig.

**APPLIED RESEARCH LABORATORIES
THE UNIVERSITY OF TEXAS AT AUSTIN
AUSTIN, TX 78713-8029
(512) 835-3200**

MISSION To contribute to fundamental scientific and engineering advances in acoustics, electromagnetics, and computer engineering; assist with interpretation and transition of relevant research results; and conduct RDT&E and field support for solution of Navy wartime problems in acoustics and electromagnetics for surface, subsurface, and space environments.

PERSONNEL Director: Dr. F. Michael Pestorius Ext. 3251

Total On Board (10/88) 505
Scientists and Engineers (10/88) 175

FUNDING (\$27,957 thousand, FY 1988)

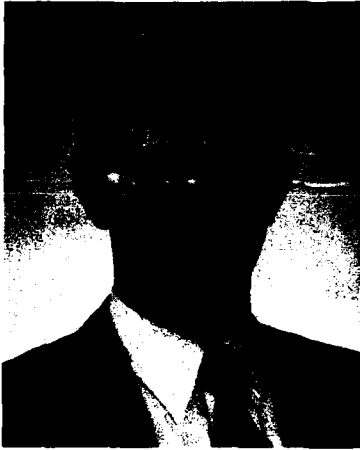
By Category	Percent	By Sponsor	Percent
6.1.....	3	NAVSEA	43
6.2.....	6	NAVAIR.....	1
6.3.....	41	SPAWAR	11
6.4.....	7	OCNR	11
6.5.....	14	CNO	2
6.6.....	6	Other Navy	7
O&MN	16	Other	25
Other	7		
Total	100	Total	100

LEADERSHIP ASSIGNMENTS

Advanced Mine Mechanisms in Complex Ocean Environments
Software Techniques and Architecture for Surface Ship Combat Systems
Mine Hunting, Mine Avoidance, and Under Ice Sonar Systems
Torpedo Countermeasure and Counter-Countermeasure Sensors
Software and Hardware Technology in Parallel/Distributed Communication Systems
Special Purpose, High Frequency/Resolution Sonars
Ocean Acoustic Effects on ASW Sonar Systems
Signal Processing and Display Concepts for ASW Active and Passive Sonar
Acoustic Sensors & Arrays
Satellite-Based Geodetic and Navigation Systems

PROPERTY	Land:	Acquisition Costs:
	Owned/Leased 52.9 acres	Real Property \$.03 million
		Equipment \$5.6 million
Buildings:		Univ. Buildings \$1.3 million
RDT&E	87,118 ft ²	Univ. Equipment \$6.4 million
Administrative	9,499 ft ²	
Other	17,218 ft ²	

**APPLIED RESEARCH LABORATORIES
THE UNIVERSITY OF TEXAS AT AUSTIN**



DIRECTOR

DR. F. MICHAEL PESTORIUS

Dr. F. Michael (Mike) Pestorius became Director, Applied Research Laboratories, The University of Texas at Austin (ARL:UT) in February 1988 following his retirement from the U.S. Navy.

Dr. Pestorius received a B.S. degree from the U.S. Naval Academy in 1961, an M.A. in Physics from Harvard University in 1964, and a Ph.D. in Electrical Engineering from The University of Texas at Austin in 1973. At both Harvard and the University of Texas, his primary research interests were in acoustic propagation and signal analysis.

His Navy experience was primarily in nuclear-powered submarines. He served as the Commanding Officer of a Fleet Ballistic Missile submarine, the USS *Vallejo*, for nearly 4 years.

Before becoming Director of ARL:UT, Dr. Pestorius was Commanding Officer of the Naval Ocean Systems Center, San Diego, Calif. He has also served in the Chief of Naval Operations Strategic Studies Group, and as the U.S. Navy's Program Manager in the Space and Naval Warfare Systems Command's nonacoustic antisubmarine warfare programs.

Dr. Pestorius and his wife, Eileen, have four children.

**APPLIED PHYSICS LABORATORY
UNIVERSITY OF WASHINGTON
SEATTLE, WA 98105-6698
(206) 543-1300**

MISSION To conduct a university-based program of fundamental research, technology advancement, and engineering support emphasizing naval applications of ocean science, ocean acoustics, and engineering.

PERSONNEL Director: Robert C. Spindel Ext. 1310

Total On Board (10/88) 222
Scientists and Engineers (10/88) 126

FUNDING (\$21,025 thousand, FY 1988)

By Category	Percent	By Sponsor	Percent
6.1	43	NAVSEA	14
6.2	16	SPAWAR	2
6.3	11	OCNR	31
6.4	3	CNO	1
6.5	0	Other Navy	41
6.6	1	Other	11
O&MN	10		
Other	16	Total	100
Total	100		

LEADERSHIP ASSIGNMENTS

Experimental Physical Oceanography
Polar Science
High-Frequency Environmental Acoustics
Acoustic Tracking Ranges
Unmanned Underwater Vehicles and Vehicle Subsystems for Research, Testing, and Other
Specialized Missions
ASW Targets—Fixed and Mobile
Exploders—Design, Prototype Development, and Failure Analysis
Marine Corrosion of Acoustic Transducers and Associated Components
Acoustic Transducers
Underwater Acoustic Reconnaissance Systems
Acoustic Survey Systems
Advanced Data Processing Techniques
Advanced Guidance and Control Techniques
ASW Sensor Performance Assessment
Support of Systems Development and Testing in the Arctic

PROPERTY	Buildings:		Acquisition Costs:	
	RDT&E	98,120 ft ²	Univ. Property	\$5.1 million
	Administrative	6,769 ft ²	Govt. Property	\$.06 million
	Other	27,455 ft ²	Univ. Equipment	\$7.2 million
			Govt Equipment	\$.60 million

**APPLIED PHYSICS LABORATORY
UNIVERSITY OF WASHINGTON**



DIRECTOR

DR. ROBERT C. SPINDEL

Dr. Robert C. Spindel was appointed Director of the Applied Physics Laboratory and Professor of Electrical Engineering at the University of Washington in 1987.

Dr. Spindel received a B.E. degree in Electrical Engineering from The Cooper Union, New York City, in 1965. He received an M.S. degree in 1966, an M.Phil. degree in 1968, and a Ph.D. degree in 1971, all in Electrical Engineering, from Yale University.

His work in underwater acoustics began with his doctoral research on acoustic scattering from the sea surface, and continued with research on volume scattering and low-frequency, side-looking, sonar systems during a 1971 post-doctoral fellowship at the Woods Hole Oceanographic Institution.

In 1972 Dr. Spindel joined the Woods Hole staff as an Assistant Scientist in the Department of Ocean Engineering. He was appointed an Associate Scientist in 1976, and a Senior Scientist and Chairman of the Department in 1982. During his chairmanship, the Ocean Engineering Department was responsible for operation of the research submersible, Alvin, and for developing the instrumentation used to find the Titanic. His research continued to focus on problems in underwater sound, with particular emphasis on acoustic navigation and on low frequency propagation, signal processing, and instrument design. He is presently developing instrumentation and techniques to apply tomographic methods to large-scale ocean measurement. Dr. Spindel is the author or coauthor of over 70 scientific and technical publications.

Dr. Spindel is active in the scientific and naval communities. He is a member of the Naval Studies Board and has served on numerous panels of the National Academy of Sciences and the Naval Research Advisory Committee. He is a Fellow of the Acoustical Society of America and a member of its Executive Council. In 1981 Dr. Spindel was awarded the A.B. Wood Medal by the British Institute of Acoustics. He serves as an Associate Editor of the IEEE Journal of Oceanic Engineering and the American Meteorological Society Journal of Oceanic and Atmospheric Technology.

Dr. Spindel and his wife, Barbara, have two children: Jennifer and Miranda.

CHIEF OF NAVAL RESEARCH



REAR ADMIRAL JOHN R. WILSON, JR., USN

Rear Admiral John R. Wilson, Jr., a native of Glendale, Calif., enlisted in the Navy in 1950. He received his commission from the U.S. Naval Academy in 1955 and was designated a Naval Aviator in 1956. He was promoted to Rear Admiral in December 1986 and became the 16th Chief of Naval Research (CNR) in September 1987.

Rear Admiral Wilson's first sea duty assignments were with Fighter Squadrons VF-112 and VF-53 aboard USS *Ticonderoga* (CVS 14), deployed to the Far East. After a tour as Aide and Flag Lieutenant to Commander, Carrier Division Four, he served as Operations Officer of VF-14, making deployments to Vietnam and the Mediterranean. In 1970 he became Executive Officer of VF-142, and commanded the "Ghostriders" from 1971 to 1972, completing his second combat tour to Vietnam. Rear Admiral Wilson assumed command of Carrier Air Wing 14 during the first deployment of the F-14 and S-3A and participated in the final operations of the Vietnam action. He later commanded the replenishment ship USS *Kansas City* (AOR 3), and became Commander, Service Squadron 3.

Rear Admiral Wilson's shore tours included two assignments at the Naval Air Test Center, Patuxent River, Md., and the Pacific Missile Test Center (PMTC), Point Mugu, Calif., where he headed the Joint Evaluation Team for the prosecution of the weapon systems and guided missile trials of the F-14A/Phoenix. In his second tour of duty on the Staff, Naval Air Forces, Pacific Fleet, he served as Chief of Staff, and in 1981 was selected to the rank of Commodore. He then acted as Director of Logistics and Security Assistance, U.S. Pacific Command, and in 1984 assumed command of PMTC. At Naval Air Systems Command he served as Director, Air-Launched Guided Missile Branch, and Deputy Assistant Commander for Navy Ranges and Field Activity Management. In 1986 he became Assistant Commander for Systems and Engineering.

A veteran of over 4,500 hours in 104 different aircraft, Rear Admiral Wilson made more than 1,000 carrier-arrested landings. He was the first pilot to fire all four air-to-air weapons from the F-14 Tomcat fighter and the only pilot to fire six missiles simultaneously against six separate targets.

As CNR, Rear Admiral Wilson oversees the Office of Naval Research; the Office of Naval Technology; the CNR field laboratories and facilities in Washington, D.C., California, and Mississippi; and numerous support activities, including science liaison offices in Tokyo and London.

Rear Admiral Wilson is a graduate of the Naval Test Pilot School and the Armed Forces Staff College. He is a designated Aeronautical Engineering Specialist and Material Professional with a master's degree in Systems Management. His military decorations include 20 personal decorations, three unit citations, and 13 service medals.

Rear Admiral Wilson is married to the former Connie Dale. They have four children: Skip, Robin, Bill, and Julie.

**DIRECTOR
OFFICE OF NAVAL RESEARCH**



DR. FRED E. SAALFELD

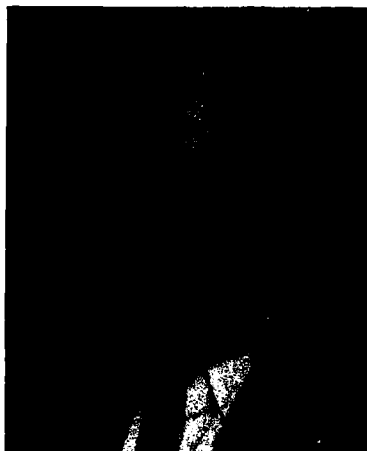
Dr. Fred E. Saalfeld became Director of the Office of Naval Research (ONR) in September 1987, assuming management of the Navy's basic research program. As ONR's Director, he also oversees the functions of the Naval Research Laboratory (NRL), the Naval Ocean Research and Development Activity, the Naval Environmental Prediction Research Facility, and ONR's foreign liaison offices in London and Tokyo, as well as other field activities. Dr. Saalfeld previously was Associate Director and Director of ONR's Contract Research Program.

Dr. Saalfeld came to ONR from NRL in 1982. He began his career at NRL in 1962 as Head of the Mass Spectrometry Section, and later became Head of the Physical Chemistry Branch. In 1976 he became Superintendent of the Chemistry Division, with responsibility for approximately 350 chemists and a program of more than \$16 million. During his tenure as Superintendent, he also served as Chief Scientist at ONR's Branch Office in London. For his accomplishments in London, he was awarded the Navy Meritorious Civilian Service Award. In 1982 Dr. Saalfeld was named NRL's Acting Associate Director of Research for Material Science and Component Technology. In this capacity, he managed a \$90 million program with more than 600 scientists.

A native of St. Louis, Mo., Dr. Saalfeld received a B.S. degree cum laude in Chemistry in 1957, and M.S. and Ph.D. degrees in Physical Chemistry from Iowa State University in 1959 and 1961, respectively. He remained at Iowa State for 1 year as an instructor. Dr. Saalfeld's government career, which spans more than 25 years, was recently highlighted when he was awarded the rank of Meritorious Executive by President Reagan. The award recognizes his success in improving the quality of basic research relationships between academia and the Department of Defense, and for establishing innovative programs to strengthen university and Navy laboratory relationships. He was also acclaimed for innovative management of programs that produced a highly successful sonar dome rubber window failure analysis program, that developed the Navy's central atmosphere monitor system, and that developed a detector for toxic fuels for the Space Shuttle program. The Presidential citation also commended him for his cost reduction efforts as a scientific administrator while at NRL and for his many contributions in the field of chemistry. Dr. Saalfeld has authored or coauthored more than 450 papers, reports, and articles in mass spectrometry, laser chemistry, and chemical spectrometry and chemical kinetics.

Dr. Saalfeld has received three outstanding government service awards, five Senior Executive Service bonus awards, the Navy Meritorious Civilian Service Award, and the Navy Superior Civilian Service Award. He is a Fellow of the American Association for the Advancement of Science and a member of the American Society for Mass Spectrometry, the American Chemical Society, the Combustion Institute, and the Society for Applied Spectroscopy. He has served as Secretary of the American Society for Mass Spectrometry and as President of the Chemical Society of Washington.

**DIRECTOR,
OFFICE OF NAVAL TECHNOLOGY**



DR. PHILIP A. SELWYN

Dr. Philip A. Selwyn was born in New York City. He received his B.S. degree in Chemistry, with distinction, from the University of Rochester in 1965, and his Ph.D. degree in Chemical Physics from the Massachusetts Institute of Technology in 1970.

From 1970 to 1976 Dr. Selwyn was a research staff member at the Institute for Defense Analyses.

He joined the federal government in 1976 as a Program Manager at the Defense Advanced Research Projects Agency. From 1979 to 1982 Dr. Selwyn was Chief Scientist for the Fleet Ballistic Missile Submarine (SSBN) Security Technology Program in the Navy's Strategic Systems Project Office. In this position he assessed the significance of future advanced technology threats to the nation's sea-based nuclear deterrent force. Dr. Selwyn served as technical director for the program, determining and implementing research and technical policy and establishing program priorities, plans, and strategy.

During 1983 Dr. Selwyn was a Presidential Exchange Executive, on loan from the Navy, working for Honeywell Inc. as Special Assistant to the Vice President for Science and Technology. He was responsible for assessing and improving the effectiveness of Honeywell's corporate research and development programs, strategic technology planning process, and top-level research and development management systems and oversight boards.

Dr. Selwyn was selected as Director of the Office of Naval Technology in September 1983. As Director of ONT, Dr. Selwyn directs and manages the Navy's exploratory development programs.

Dr. Selwyn is a nationally recognized authority in advanced nonacoustic submarine detection technology and SSBN security. He has published in the areas of operations analysis, hydrodynamics, upper atmosphere physics, and nuclear weapons effects. His awards include the Meritorious Executive Presidential Rank award, the Secretary of Defense Meritorious Civilian Service Medal, and the Navy Superior Civilian Service Medal.

Dr. Selwyn is married to the former Karen Sue Peller. They have a son, Eric.

NAVAL RESEARCH LABORATORY
WASHINGTON, D.C. 20375-5000
(202) 767-3200

MISSION To conduct a broadly based multidisciplinary program of scientific research and advanced technological development directed toward new and improved materials, equipment, techniques, systems, and related operational procedures for the Navy.

PERSONNEL **Commanding Officer:** CAPT William G. Clautice, USN Ext. 73403
Director of Research: Dr. Timothy Coffey Ext. 73301

	Civilian	Military
Total On Board (10/88)	3,652	152
FTP Scientists & Engineers (10/88)	1,587	

FUNDING (\$346,000 thousand, FY 1988)

By Category	Percent	By Sponsor	Percent
6.1.....	21	OCNR	38
6.2.....	14	SPAWAR	7
6.3.....	5	NAVAIR	5
6.4.....	9	NAVSEA	10
6.5.....	1	Other Navy	25
6.6.....	2	Other	15
O&MN	4	Total	100
Other Navy	23		
Other	21		
Total	100		

LEADERSHIP

ASSIGNMENTS* Primary In-House Research for
Physical, Engineering, and
Environmental Sciences
Broadly Based Exploratory and
Advanced Development in
Response to Identified and
Anticipated Navy Needs
Space Systems for the Navy

PROPERTY

Land: Owned 598 acres Leased 583 acres Buildings: RDT&E 2,689,754 ft ² Administrative 196,018 ft ² Other 290,575 ft ²	Acquisition Costs: Real Property \$135.1 million
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NAVAL RESEARCH LABORATORY



COMMANDING OFFICER

CAPTAIN WILLIAM G. CLAUTICE, USN

Captain William G. Clautice, a native of Baltimore, Md., is a 1959 graduate of the U.S. Naval Academy and holds master's degrees in Ocean Engineering, Systems Management, and Business Administration.

His first 10 years of sea duty were served aboard a destroyer and a diesel submarine. During this time he also received nuclear power training and was involved in building two missile-firing submarines.

Following a shore duty assignment as instructor and Division Director at the Naval Submarine School, Captain Clautice served aboard a nuclear attack submarine and qualified as Chief Engineer of a naval nuclear power plant. In 1973, while serving as Executive Officer of a Poseidon missile submarine, he was selected for nuclear submarine command.

Captain Clautice is a distinguished graduate of the Program Managers' Course at Defense Systems Management College. He served at Headquarters, Strategic Systems Programs, from 1975 to 1979. He then served as Commanding Officer of the Naval Ordnance Test Unit, Cape Canaveral, where he was responsible for flight testing the Navy's strategic missiles, including Trident. In 1983 he assumed command of the Strategic Weapons Facility Pacific, Bremerton, Wash., where Trident missiles were assembled and new Trident submarines were outloaded. Captain Clautice became the Assistant Chief of Naval Research in 1985 and assumed command of the Naval Research Laboratory in August 1987.

Captain Clautice is the author of three technical papers that have been published in the Institute of Navigation Journal (1971, 1978), the Marine Technology Society Journal (1974), and the Institut Francais de Navigation Revue Technique (1979). He has been awarded the Legion of Merit (two awards), the Meritorious Service Medal (two awards), the Navy Achievement Medal (two awards), the Navy Unit Commendation, and the Meritorious Unit Commendation, as well as several campaign and service medals.

He is married to the former Joyce Marie Reilly. They have three children: Kimberly Ann; Susanne, a graduate of the U.S. Naval Academy; and Jim, an Eagle Scout in his third year at the U.S. Naval Academy.

NAVAL RESEARCH LABORATORY



DIRECTOR OF RESEARCH

DR. TIMOTHY COFFEY

Dr. Timothy Coffey was born in Washington, D.C. He graduated from the Massachusetts Institute of Technology in 1962 with a B.S. degree in Electrical Engineering. He received his M.S. degree in 1963 and his Ph.D. degree in 1967, both in Physics, from the University of Michigan.

During his graduate career, Dr. Coffey worked as a research assistant at the University of California, as a research physicist at the Air Force Cambridge Research Laboratories, and as a teaching fellow and research assistant in physics at the University of Michigan. As a scientific consultant for EG&G, Inc., from 1966 to 1971, he was involved in investigations in theoretical and mathematical physics.

Dr. Coffey came to the Naval Research Laboratory (NRL) in 1971 as Head of the Plasma Dynamics Branch, Plasma Physics Division. In this position, he directed research in the simulation of plasma instabilities, the development of multidimensional fluid and magnetohydrodynamic codes, and the development of computer codes for treating chemically reactive flows. In 1975 he was named Superintendent of the Plasma Physics Division. In 1980 Dr. Coffey was appointed Associate Director of Research for General Science and Technology. He was appointed Director of Research of NRL in 1982.

Dr. Coffey is recognized as an authority on the theory of nonlinear oscillations and has played a major role in the national program on high-altitude nuclear effects. The author or coauthor of over 70 publications and reports, he made several fundamental contributions to the theory of electron beam-plasma interaction and to the understanding of plasma processes in the earth's ionosphere.

Dr. Coffey is a Fellow of the American Physical Society and a Fellow of the Washington Academy of Sciences.

Dr. Coffey was awarded the Presidential Rank of Meritorious Executive in 1981. In 1987 he was awarded the Senior Executive Service Rank of Distinguished Executive by President Reagan.

He and his wife, Paula, have three children: Donna, Marie, and Timothy.

NAVAL OCEAN RESEARCH AND DEVELOPMENT ACTIVITY
STENNIS SPACE CENTER, MS 39529-5004
(601) 688-4010 AV 485-4010

MISSION To carry out a broadly based RDT&E program in ocean science and technology, with emphasis on understanding ocean processes through measurement and analysis, and the effects of the ocean environment on Navy systems and operations.

PERSONNEL **Commanding Officer:** CAPT Anthony C. Esau, USN Ext. 4010
Technical Director: Dr. William B. Moseley Ext. 4670

	Civilian	Military
Total On Board (10/88)	421	10
FTP Scientists & Engineers (10/88)	214	9

FUNDING (\$54,384 thousand, FY 1988)

By Category	Percent	By Sponsor	Percent
6.1	14.0	OCNR	26.7
6.2	26.7	ONT	22.5
6.3	33.7	CNO	20.4
6.4	3.1	SPAWAR	12.4
6.5	9.5	NAVO	6.1
6.6	2.7	DMA	4.3
Other	10.3	NAVSEA	2.7
		Other Navy	4.3
		Other	6
Total	100	Total	100

LEADERSHIP ASSIGNMENTS Principal Navy Research, Exploratory Development, and Advanced Development for Ocean Environmental Measurement; and Development of Relevant Instrumentation, Analysis, and Prediction
Mapping, Charting, and Geodesy
Environmental Ocean Acoustics Investigations

PROPERTY Land (Tenant Activity at Stennis Space Center)

Acquisition Costs:
Real Property \$18.4 million
Equipment \$31.0 million

Buildings:
RDT&E 113,249 ft²
Administrative 24,986 ft²
Other 68,305 ft²

NAVAL OCEAN RESEARCH AND DEVELOPMENT ACTIVITY



COMMANDING OFFICER

CAPTAIN ANTHONY C. ESAU, USN

Captain Anthony C. Esau, a native of New York City, graduated from the U.S. Naval Academy in 1961.

After receiving his commission as Ensign, Captain Esau, who subsequently earned Navy designations as a submariner and diver, served aboard USS *Lake Champlain* (CVS 39) as Assistant Navigator and Athletic Officer. He then attended submarine school and served in a variety of assignments (Engineering Officer, Weapons Officer, Operations Officer) aboard USS *Barracuda* (SST 3), USS *Carp* (SS 338), and USS *George Washington Carver* (SSBN 656).

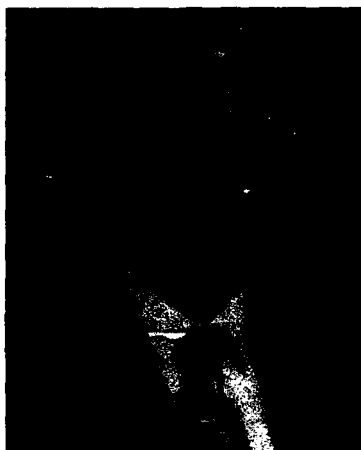
During 1968 and 1969 Captain Esau attended deep sea diving school. For the next 41 months he served aboard USS *Sunbird* (ASR 15), the first 14 months as Executive Officer, and thereafter as Commanding Officer. From 1972 to 1976 he served as Commanding Officer, Naval Diving and Salvage School, Washington, D.C.

Captain Esau became Commanding Officer of USS *Ortolan* (ASR 22) in 1976. In 1979 he was transferred to the staff of Commander, Submarine Force, Atlantic Fleet, as War Plans Officer, and, later, as Force Personnel Officer. From 1981 to 1983 Captain Esau served as Chief Staff Officer on the staff of Commander, Submarine Squadron 6. His next assignment was as Director of Submarine Safety Programs at the Naval Safety Center, Norfolk, Va. Captain Esau became Commanding Officer of the Naval Ocean Research and Development Activity in September 1986.

His awards include the Meritorious Service Medal with gold star, the Navy Commendation Medal with gold star, the National Defense Medal, the Navy Expeditionary Medal, and the Polaris Patrol Pin with three stars.

Captain Esau has two daughters, Laura and Catherine.

NAVAL OCEAN RESEARCH AND DEVELOPMENT ACTIVITY



TECHNICAL DIRECTOR

DR. WILLIAM B. MOSELEY

Dr. William B. Moseley is a native of Savannah, Ga., and a graduate of the Georgia Institute of Technology. He joined the Naval Ocean Research and Development Activities (NORDA) in 1983 as Associate Technical Director for Ocean Acoustics and Head of NORDA's Ocean Acoustics and Technology Directorate.

Dr. Moseley received a B.S. degree in Physics in 1964, an M.S. degree in 1966, and a Ph.D. degree, also in Physics, in 1968, all three degrees conferred by Georgia Institute of Technology. During his graduate student days, he also served as an instructor in the university's Aerospace Engineering Department and worked on a NASA-Georgia Tech contract to study upper atmospheric physics.

In 1968 he was hired by the Naval Research Laboratory (NRL) to work on a large-aperture, long-range propagation project. From 1972 to 1974, he was NRL's first exchange scientist to the Admiralty Research Laboratory in Teddington, England. He returned to NRL as project leader for theoretical and experimental studies of environmental limitations of antenna design.

In 1976 Dr. Moseley was named Head of the Signal Coherence Section of NRL's Large Aperture Acoustics Branch and, in 1980, was appointed Head of the laboratory's Applied Acoustics Branch.

Dr. Moseley has authored or coauthored more than 40 publications and professional papers. He has served as Chairman of the Navy-wide Arctic Planning Group and of the Environmental Acoustics Subgroup of the Mobile Ocean Sonar Technology (MOST) Committee.

He is a member of Tau Beta Pi, the National Engineering Honor Society; Sigma Pi Sigma, the National Physics Honor Society; Sigma Xi, the Scientific Research Society of America; and the Acoustical Society of America.

NAVAL ENVIRONMENTAL PREDICTION RESEARCH FACILITY
MONTEREY, CA 93948-5006
(408) 847-4731 AV 878-4731

MISSION To conduct research and development directed toward providing objective local, regional, and global environmental analysis and prediction techniques; and to provide planning, modeling, and evaluation services for determining the effect of environmental elements on naval weapon systems.

PERSONNEL Commanding Officer: CDR William L. Shutt, USN Ext. 4750
Technical Director: Dr. John B. Hovermale Ext. 4721

	Civilian	Military
Total On Board (10/88)	59	10
FTP Scientists & Engineers (10/88)	44	4

FUNDING (\$6,010 thousand, FY 1988)

By Category	Percent	By Sponsor	Percent
6.1	5	CNR	29
6.2	31	SPAWAR	55
6.3	31	Other Navy	16
6.4	14	Total	100
6.6	14		
Other	5		
Total	100		

LEADERSHIP ASSIGNMENTS

Only Navy Atmospheric Research
and Development Laboratory
Global Atmospheric Modeling
Remote Sensing Applications
Weather Analysis and Forecasting
Techniques
Naval Warfare Support
Environmental Command Control
Tactical Decision Aids

Environmental Effects on Weapon
Systems
Technical Direction Activity for
Tactical Environmental Support
System (TESS)
Ground Processing Software Development
for Navy Remote Ocean Sensing
System (NROSS) Satellite

PROPERTY

Land (Tenant Activity at
Naval Postgraduate School)

Acquisition Costs:

Real Property N/A
Equipment \$2.7 million

Buildings:

RDT&E 18,500 ft²
Administrative 3,500 ft²
Other 6,500 ft²

NAVAL ENVIRONMENTAL PREDICTION RESEARCH FACILITY



COMMANDING OFFICER

COMMANDER WILLIAM L. SHUTT, USN

Commander William L. Shutt, a native of El Campo, Tex., was commissioned after graduating with merit from the U.S. Naval Academy in 1971. He received a master's degree in Meteorology and Oceanography from the Naval Postgraduate School in 1976, and is a graduate of the Navy's Mine Countermeasures Officers' School and the Armed Forces Staff College.

Commander Shutt's first duty assignment was as Mine Countermeasures Officer, Navigator, and Operations Officer aboard USS *Excel* (MSO 439) from 1971 to 1974. After his studies at the Naval Postgraduate School, he served as Executive Officer of Oceanographic Unit 3 during conversion of SS *Canada Mail* into USNS *H.H. Hess* (TAGS 38) in 1977 and 1978. His next assignment was as Officer in Charge, Naval Oceanography Command Detachment, Roosevelt Roads, Puerto Rico.

As Meteorologist aboard USS *Independence* (CV 62) from 1981 to 1983, Commander Shutt supported the Commander, Striking Force, Sixth Fleet, during the Lebanese crisis in 1982 and also served as Second Fleet Liaison Officer to the Joint Task Force supporting the Grenada invasion in 1983. His next assignment was as Oceanographer for the Navy Operational Intelligence Center, Suitland, Md., where he provided operational oceanography support to the Navy's primary indication and warning center.

Before assuming his present command, Commander Shutt was on the Staff of the Oceanographer of the Navy, serving as Remote Sensing Programs Officer in the Oceanography Development Division. In this capacity he was responsible for monitoring the development of two key remote sensing programs, the AN/SMQ-11 Meteorological Satellite Receiver and the Navy Remote Ocean Sensing System.

Commander Shutt assumed command of the Naval Environmental Prediction Research Facility on 25 February 1988.

He holds the Meritorious Service Medal, the Navy Commendation Medal (two awards), the Navy Achievement Medal, the Navy Expeditionary Medal, the Armed Forces Expeditionary Medal, the National Defense Medal, and the Vietnam Service Medal.

Commander Shutt and his wife, the former Judith Ann Hutchison, have two daughters: Melissa and Suzanne.

NAVAL ENVIRONMENTAL PREDICTION RESEARCH FACILITY



TECHNICAL DIRECTOR

DR. JOHN B. HOVERMALE

Dr. John B. Hovermale was born in Martinsburg, W. Va. He received his B.S., M.S., and Ph.D. degrees in Meteorology from Pennsylvania State University in 1960, 1962, and 1965, respectively.

His career in meteorology began in 1959 when he worked as a summer trainee for the National Weather Service. After earning his B.S. and M.S. degrees, he joined the National Meteorological Center, Washington, D.C., as a research meteorologist, specializing in prediction model development.

From 1967 to 1973, Dr. Hovermale served on the faculty of Pennsylvania State University as Assistant Professor of Meteorology. His research work centered on objective isentropic analysis techniques and mesoscale modeling with emphasis on airflow over lakes and frontal motions.

In 1973 he rejoined the National Meteorological Center to lead a research program in objective hurricane prediction. In 1977 he received the Gold Medal of the Department of Commerce for his work in model development.

Before becoming Technical Director of the Naval Environmental Prediction Research Facility in January 1985, Dr. Hovermale was Deputy Chief of the Development Division of the National Meteorological Center, a post he had held since 1978.

Active in the scientific community at large, Dr. Hovermale has served on several committees of the American Meteorological Society, was editor of the AMS publication *Monthly Weather Review* (1977 to 1980), and is a member of working groups to advise on research initiatives for the world Meteorological Organization and the International Union of Geodesy and Geophysics. He also is a member of the Board of Atmospheric Sciences and Climate of the National Research Council.

Dr. Hovermale and his wife, Susan, have three sons: Michael, Christopher, and Benjamin.

**MARINE PHYSICAL LABORATORY
SCRIPPS INSTITUTION OF OCEANOGRAPHY**



DIRECTOR OF RESEARCH

DR. KENNETH M. WATSON

Dr. Kenneth Watson, a native of Des Moines, Ia., graduated from Iowa State University with a B.S. degree in Physics and Electrical Engineering. He received a Ph.D. degree in Physics from the University of Iowa in 1948.

After spending a year at the Institute of Advanced Study in a postdoctoral position, Dr. Watson joined the Lawrence Berkeley Laboratory staff in 1949. In 1951 he became a faculty member at Indiana University. In 1953 he joined the Physics Department of the University of Wisconsin. In 1957 he became a member of the Physics Department of the University of California, Berkeley. During this time he was also a staff member of the Lawrence Laboratory. In 1981 Dr. Watson became a faculty member of the Scripps Institution of Oceanography Department, University of California, San Diego, and Director of the Marine Physical Laboratory, which is a research unit within the Scripps Institution of Oceanography.

Dr. Watson has done research in nuclear physics, plasma physics, statistical mechanisms, and fluid dynamics. He is the author or coauthor of over 120 journal publications and 74 books.

Dr. Watson is a member of the National Academy of Sciences, a member of the JASON Advisory Group, and a Fellow of the American Physical Society. He is also a member of the American Geophysical Union and the Acoustical Society of America. He was granted a D.Sc. degree from Indiana University in 1976.

He and his wife, Elaine, have two children: Ronald and Mark.

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S. E. SANDERS, Head, Technical Information Department,
NWC, 21 December 1988.

Extra copies of this publication are available at SPAWAR (005).