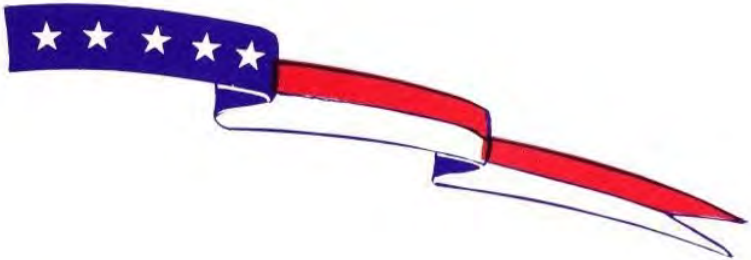
Commissioning

United States Navy Underwater Sound Laboratory

New London, Connecticut

3 DECEMBER, 1966



COMMISSIONING OF A NAVY SHIP

The commissioning ceremony marks the acceptance of a ship as a unit of the Operating Forces of the United States Navy. At the moment of breaking the commissioning pennant, USS FRANCIS SCOTT KEY (SSBN 657) becomes the responsibility of the Commanding Officer who, together with the ship's officers and men, has the duty of making and keeping her ready for any service required by our nation in peace or war.

* * * * * *

The commissioning pennant is believed to date from the 17th century, when the Dutch were at war with the English. The Dutch Admiral TROMP hoisted a broom at his masthead to indicate his intention to sweep the English from the sea. This gesture was answered by the English admiral who hoisted a horse whip, indicating his intention to chastise the Dutch. The English were victorious and ever since the narrow, or coach whip, pennant (symbolizing the original horse whip) has been adopted by all nations as the distinctive mark of a ship of war.

USS FRANCIS SCOTT KEY (SSBN657)

★ ★ ★ ★

Built by
GENERAL DYNAMICS
Electric Boat Division

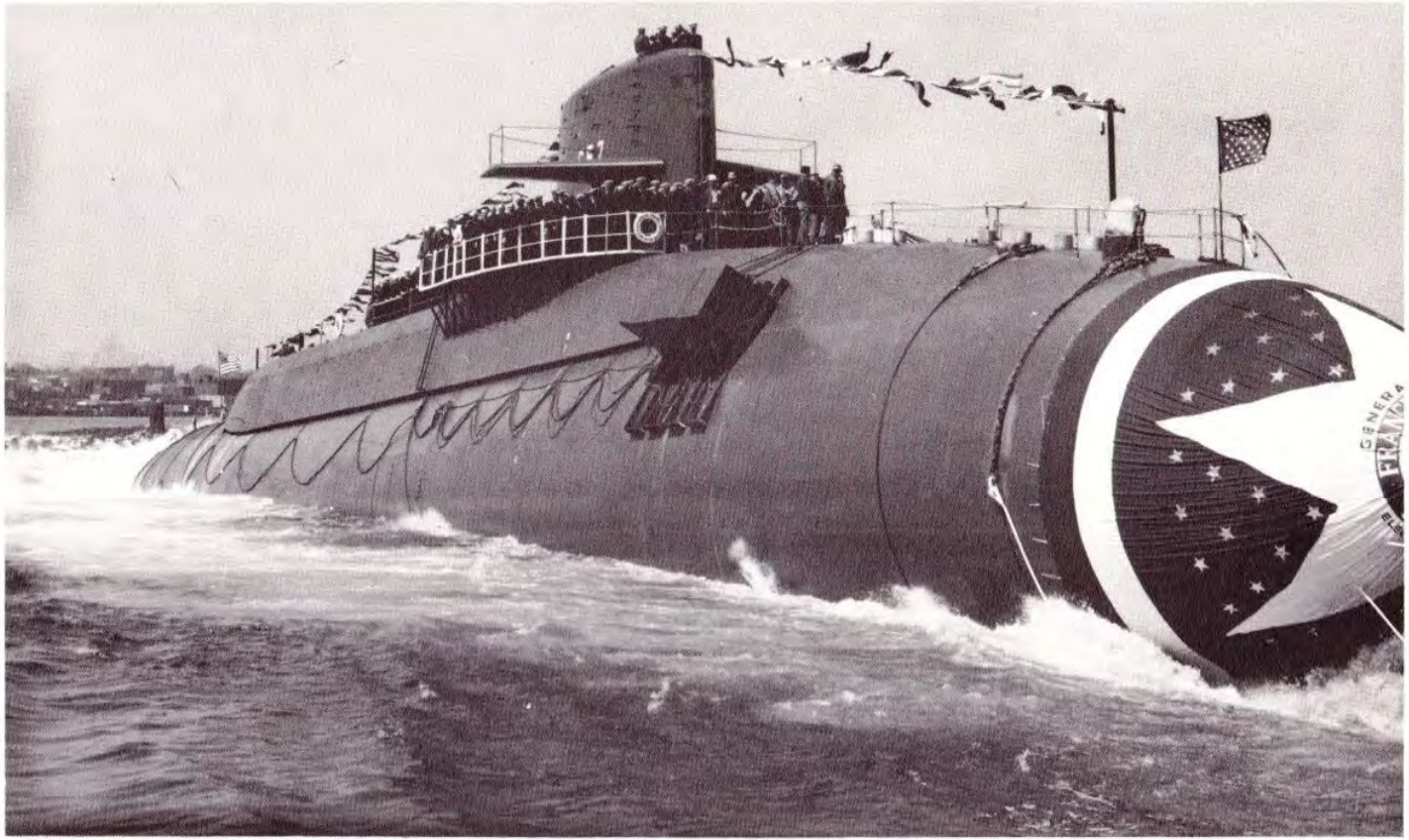
Keel Laid: 5 December 1964
Launched: 23 April 1966
Commissioned: 3 December 1966

★ ★ ★ ★

Co-Sponsor
Mrs. Marjory Key Thorne
Mrs. William T. Jarvis

KEEL LAYING
5 December 1964

CHRISTENING
23 April 1966



LAUNCHING
23 April 1966

FRANCIS SCOTT KEY

Francis Scott Key was born to a family of substantial wealth on August 1, 1779, at the family estate, Terra Rubra, in the Monocacy Valley of western Maryland. At the age of 10, he entered the grammar school operated by St. John's College, in Annapolis, Md., and at 17 received his degree. Key remained in Annapolis to study law in the office of his uncle, Philip Barton Key, and to court Miss Mary Tayloe Lloyd, his future wife. In 1800, Key returned to western Maryland, and opened a law office in Frederick, not far from his birthplace. Five years later, at the suggestion of Philip Key, he moved to Georgetown, a suburb of Washington.

The decision proved to be fortunate. Key soon developed a lucrative law practice. He frequently appeared before the Supreme Court of the United States to argue cases significant in American legal history, and during Andrew Jackson's administration he was appointed United States district attorney.

Key did not permit his law practice to consume all his energies, however. He was also an active social worker. He helped organize the Lancaster Society for the free education of poor children in Georgetown. He was a charter member of the American Colonization Society, and he gave liberal financial support to those organizations he deemed worthy. Friends and strangers found him warmhearted, generous, and eager to assist them in any way he could.
Francis Scott Key's benevolent nature was that of a profoundly religious man. At one time he seriously considered abandoning law for the ministry. He finally resolved, however, to seek solace for his conscience as an active member of the Protestant Episcopal Church. Throughout the span of his life, Key showed extreme tolerance toward other sects and creeds. His deeply religious outlook is reflected in his speeches, correspondence, and serious poetry. This deep-rooted piety, with his intense attachment to his country, conditioned Key's emotional response to the dramatic moment when he wrote the poem for which he is known — "The Star-Spangled Banner."

USS FRANCIS SCOTT KEY (SSBN657)

The USS FRANCIS SCOTT KEY (SSBN657) is the Navy's 60th nuclear powered submarine and the 39th of its Polaris submarine fleet. The ship is 425 feet long with a beam of 33 feet and displaces approximately 8,000 tons submerged.

FRANCIS SCOTT KEY began her waterborne career on 23 April 1966 when she was launched at General Dynamics Corporation's Electric Boat Division at Groton, Connecticut. About six months later she set out on her first series of sea trials under the direction of Vice Adm. H. G. RICKOVER, acting for the U. S. Atomic Energy Commission and the U. S. Navy, to test operation of the nuclear powerplant and handling characteristics of the ship. Immediately after successful completion of first sea trials further sea trials were undertaken to test the complex Polaris Weapon System and other intricate pieces of equipment installed on the ship.

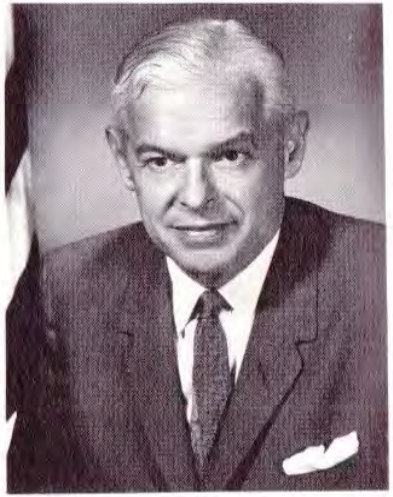
Fast, silent and virtually immune to surprise attack, the FRANCIS SCOTT KEY combines the almost unlimited endurance of nuclear power with the deterrent might of 16 A-3 Polaris missiles capable of wreaking more havoc than all the bombs of World War II. These missiles have a range of about 2,500 nautical miles and are housed in 16 launching tubes located just aft of the sail.

Manned by alternate crews (Blue and Gold) — while one is at sea the other will be ashore training — she will be on duty almost constantly with address unknown, an underwater mobile missile launching platform hidden and virtually indestructible. Under U. S. control at all times the FBM (Fleet Ballistic Missile) system provides the United States with a powerful deterrent force to those who might start a global war.

In order to provide for maximum crew comfort during the 60 day Polaris patrols the ship is equipped with 390 tons of air conditioning equipment. Special atmospheric purification equipment removes irritants from the air and maintains the proper balance of oxygen, carbon dioxide and other atmospheric elements, and electrolytic oxygen generators permit the submarine to manufacture all of its oxygen from sea water.

The Commander in Chief
Lyndon B. Johnson

The Secretary of Defense
Robert S. McNamara



The Secretary of the Navy
Paul H. Nitze

The Chief of Naval Operations
Admiral David L. McDonald

Commander Submarine Force
U. S. Atlantic Fleet
Vice Admiral Arnold F. Schade

Commander Submarine Flotilla Two
U. S. Atlantic Fleet
Rear Admiral Joseph W. Williams, Jr.

CAPTAIN FRANK W. GRAHAM, USN

COMMANDING OFFICER - BLUE

Captain GRAHAM was born on 26 June 1922, in Peoria, Illinois, the son of Mr. and Mrs. Frank F. GRAHAM. He graduated from R. A. Long High School, in Longview, Washington, and attended Whitman College in Walla Walla, Washington. He received his degree in mathematics in June 1944, and subsequently attended Northwestern University Midshipman School prior to receiving his commission in the United States Navy.

After commissioning, Captain GRAHAM was ordered to the USS CHICAGO (CA136) where he served in the Pacific Theatre until after the end of World War II. Thereafter he served on the staff of Commander Naval Forces Far East as Flag Lieutenant and personal aide to Vice Admiral GRIFFIN.

Captain GRAHAM's submarine service has included tours as Weapons and Engineer Officer on the USS CHIVO (SS341), as Engineer and Operations Officer on the USS HALFBEAK (SS352), Executive Officer on the USS CLAMAGOR (SS343), and as Commanding Officer on the USS ATULE (SS403).

In May 1960, he reported to the Naval Reactors Branch, Atomic Energy Commission for duty under instruction. After a year of study, he attended the Polaris Command Course at Dam Neck, Virginia, prior to reporting to the USS SAM HOUSTON (SSBN609) (Gold) as commissioning Executive Officer. In April 1963, he reported to the USS THEODORE ROOSEVELT (SSBN600) (Blue) as Commanding Officer and was detached in July 1965, following ROOSEVELT's 17th Polaris Patrol and return to the United States for conversion. He reported as Commanding Officer of FRANCIS SCOTT KEY (SSBN657) Precommissioning Unit in August 1966.

Captain GRAHAM married the former E. Selby INMAN of South Nyack, New York, in August 1950. They have five children.

LCDR LOGAN was born on 23 February 1930 in Clarksville, Arkansas, the son of Mr. and Mrs. Joseph LOGAN. Upon graduation from Fort Smith Senior High School, Fort Smith, Arkansas, he attended the U. S. Naval Academy and was commissioned in June 1953. He was then attached to USS SANBORN (APA193). Following attendance at the U. S. Naval Submarine School, LCDR LOGAN served aboard USS REQUIN (SS481) as Supply Officer and Engineer Officer. In 1958 he attended the Navy's Nuclear Power School and completed Prototype training in Idaho. In 1959 he reported to the Precommissioning Unit of USS GEORGE WASHINGTON (SSBN598) as an Engineering Division Officer after which he served with the Precommissioning Unit of USS PATRICK HENRY (SSBN-599) as Diving Officer and Damage Control Assistant. He subsequently served as Engineer Officer and completed six partols on the PATRICK HENRY. Following duty on PATRICK HENRY he reported as Gold Crew Executive Officer on USS JAMES MADISON (SSBN627) Precommissioning Unit and completed three patrols prior to reporting to Naval Reactors Branch, Atomic Energy Commission for duty under instruction. In October 1966, following completion of this course of instruction, he reported as Gold Crew Commanding Officer, FRANCIS SCOTT KEY (SSBN-657). LCDR LOGAN married the former Dianna M. ROGALSKY of New York City in May 1955.

LCDR JOSEPH B. LOGAN, USN
COMMANDING OFFICER - GOLD

Blue Crew

BLUE CREW

OFFICERS

CAPT F. W. Graham, USN ..... Commanding Officer

LCDR W. L. Bohannan, USN ..... Executive Officer
LCDR H. D. Barker, USN ..... Navigator
LT R. W. Dommers, USN ..... Main Propulsion Assistant
LT W. J. Donaldson, USN ..... Operations Officer
LT(MC) J. H. Earls, USN ..... Medical Officer
LT W. B. Garrett, USN ..... Weapons Officer

LTJG R. I. Itkin, USN ..... "A" Division Officer
LT R. K. Merkey, USN ..... Assistant Weapons Officer
LTJG C. P. O'Leary, Jr., USN ..... Electrical Officer
LTJG(SC) G. M. Singer ..... Supply Officer
LT R. W. Vogel, III, USN ..... Reactor Control Officer
LT D. Volgenau, USN ..... Engineer Officer

CHIEF PETTY OFFICERS

Ames, C. A., Sr., EMC(SS)
Beaton, J. M., ETC(SU)
Bennett, J. L., QMC(SS)
Cabalona, R. G., SDCS(SS)
Dooley, J. P., TMC(SS)
Ivy, E., E., MMC(SS)
Lewis, E. D., CSC(SS)
MacGregor, C. H., HMC(SS)
Mayberry, T. E., RMCS(SS)
Pimentel, C. F., EMC(SS)
Pinckert, J. D., MTC(SS)
Shelp, R. H., STCS(SS)
Troxell, W. T., ENC(SS)
Williams, F. E., EMC(SS)
Williams, G. E., Jr., ETCM(SS)
Worsfold, E., ETCS(SS)

ENLISTED PERSONNEL

Abernathy, R. L., ET1(SU)
Allfrey, R. G., FTB2(SU)
Ambron, H. J., STS2(SS)
Avery, G. R., IC2(SS)
Balcom, D. G., IC3(SU)
Barden, W. F., IC1(SS)
Barry, J. F., TM3(SU)
Bates, C. E., FTB2(SU)
Bunting, C. M., MM2(SU)
Burrow, C. H., TM2(SU)
Butcher, D. A., TM3(SU)
Caputo, A. M., EM2(SS)
Cather, J. B., ST1(SS)
Chim, R. B., SN(SU)
Cooke, R. B., MM3(SU)
Corbin, C. O., MM1(SS)
Coughlin, D. W., ETN2(SS)
Cowart, T. E., TM2(SS)
Dawson, R. W., MT2(SS)
Deshazo, W. W., III, MM2(SU)
Donovan, J. C., ETN2(SS)
Doran, T. J., MT2(SS)
Dougherty, J. R., RM2(SS)
Duffy, M. E., RMSN(SS)
Engle, R. C., MM3(SS)
Ethington, D. M., MM2(SS)
Eubanks, L. A., Jr., QM2(SU)
Evans, T. R., II, STS2(SS)
Fuller, C. C., ETR2(SS)
Franceschiello, G. RM1(SS)
Glover, R. A., TM1(SS)
Goss, T. A., FTG2(SS)
Grant, P. J., MM2(SS)
Hankel, E. M., MM1(SS)
Holiman, N. E., QM1(SS)
Hofp, R. E., EN2(SS)
Hurder, J. B., FA(SU)
Jonason, A. S., CS3(SS)
Kirkwood, D. L., IC1(SS)
Kloepfer, D. B., STSSN(SU)
Klimek, S. J., Jr., MM2(SU)
Komac, M. J., FTB2(SS)
Kretowitz, E., TM1(SS)
Krumpholz, D. P., SN(SU)
Lanoue, D. B., Jr., QM1((SS)
LaPorte, C. R., EN1(SS)
Laverty, T. P., FN(SU)
LeAnna, M. L., RM2(SS)
Lewis, C. R., MT3(SU)
Lyon, D., III, FTG1(SS)
Madigan, W. W., Jr., QM2(SU)
Mann, J. "W", ET1(SS)
McAdams, VD., III, ET1(SS)
Medeiros, A. F., Jr., ENFN(SG)
Melher, P. J., MT2(SS)
Milazzo, J. H., MT1(SS)
Miller, D. L., FN(SU)
Miskanin, R. A., MM1(SS)
Mitchell, B. R., SK1
Mongelluzzo, L. A., ET1(SS)
Moore, M. J., ETN2(SS)
Murrell, F. R., Jr., SD1(SS)
Neal, R. A., FTB2(SS)
Nelson, D., TN
Parkins, C. R., ETN2(SU)
Pearson, E. R., FTB2(SS)
Pedersen, R. A., EN1(SS)
Peterson, R. W., EN1(SS)
Poe, R. R., YN2(SS)
Pratt, D. C., SN(SU)
Proper, J. R., EM2(SS)
Prorok, E. R., RMSN(SU)
Pyeatt, R. L., Jr., SA(SU)
Recely, G. A., ETR2(SS)
Reddock, J. E., EN2(SS)
Reinoehl, P. W., YN1(SS)
Reynolds, D. N., EM1(SS)
Romero, J. L., MM1(SS)
Rose, G. W., FTB2(SS)
Rudolph, R. E., ET1(SU)
Sabbath, C. O., CS2(SS)
Satchell, W. F., MT3(SS)
Scairpon, J., EN1(SS)
Sharpe, W. R., CS1(SS)
Shaw, J. D., Jr., MM2(SS)
Shores, L. R., EM1 (SS)
Smith, J. P., MT3(SU)
Smith, J. P., MM2(SS)
Sparks, K. A., Jr., MM2(SU)
Sprecher, R. E., MM3(SU)
Steadman, C. C., III, ET1(SS)
Stephens, K. D., IC1(SS)
Stills, F. C., MM2(SS)
Stovall, W. D., MT3(SU)
Strahan, G. F., IC1(SS)
Taylor, K. N., MM1(SS)
Valella, M. D., TM3(SU)
Varese, J. J., IC2(SS)
Vavra, F. A., TM1(SS)
Wagner, P. E., EN2(SS)
Wahl, J. C., ETR3(SU)
Walsh, J. P., IC3(SS)
Welch, L. L., MM2(SU)
Wicks, M. C., ETN2(SS)
Wilber, H. A., SK1(SS)
Wise, W. H., ETN2(SS)
Zakarian, G, Jr., SA(SU)
Zimmerman, K. A., SN(SU)

Commissioni

INVOCATION
Lieutenant Commander H. Thorton Kelly, (CHC), USN

INTRODUCTION OF BUILDER'S REPRESENTATIVE
Captain Harry A. Jackson, USN, Supervisor of Shipbuilding, Groton, Connecticut

REMARKS
Mr. J. William Jones, Jr., President
Electric Boat Division, General Dynamics Corporation

INTRODUCTION OF THE COMMANDANT, THIRD NAVAL DISTRICT
Captain Harry A. Jackson, USN

REMARKS AND READING OF AUTHORITY TO PLACE THE SHIP IN COMMISSION
Rear Admiral George R. Luker, USN, Commandant, Third Naval District

HOISTING OF THE ENSIGN, UNION JACK, AND COMMISSIONING PENNANT

NATIONAL ANTHEM
United States Coast Guard Band

ng Program

ASSUMPTION OF COMMAND AND SETTING OF THE WATCH
Captain Frank W. Graham, USN

REPORTING OF THE GOLD CREW AND REMARKS
Lieutenant Commander Joseph B. Logan, USN

REMARKS
Captain Frank W. Graham, USN

INTRODUCTION OF THE PRINCIPAL SPEAKER
Rear Admiral Joseph W. Williams, Jr., USN, Commander Submarine Flotilla TWO, U. S. Atlantic Fleet

ADDRESS
Dr. Richard D. Weigle, President, St. Johns College, Annapolis, Maryland

BENEDICTION
Lieutenant Commander H. Thorton Kelly, (CHC), USN

GOLD CREW

OFFICERS

LCDR J. B. Logan, USN ..... Commanding Officer

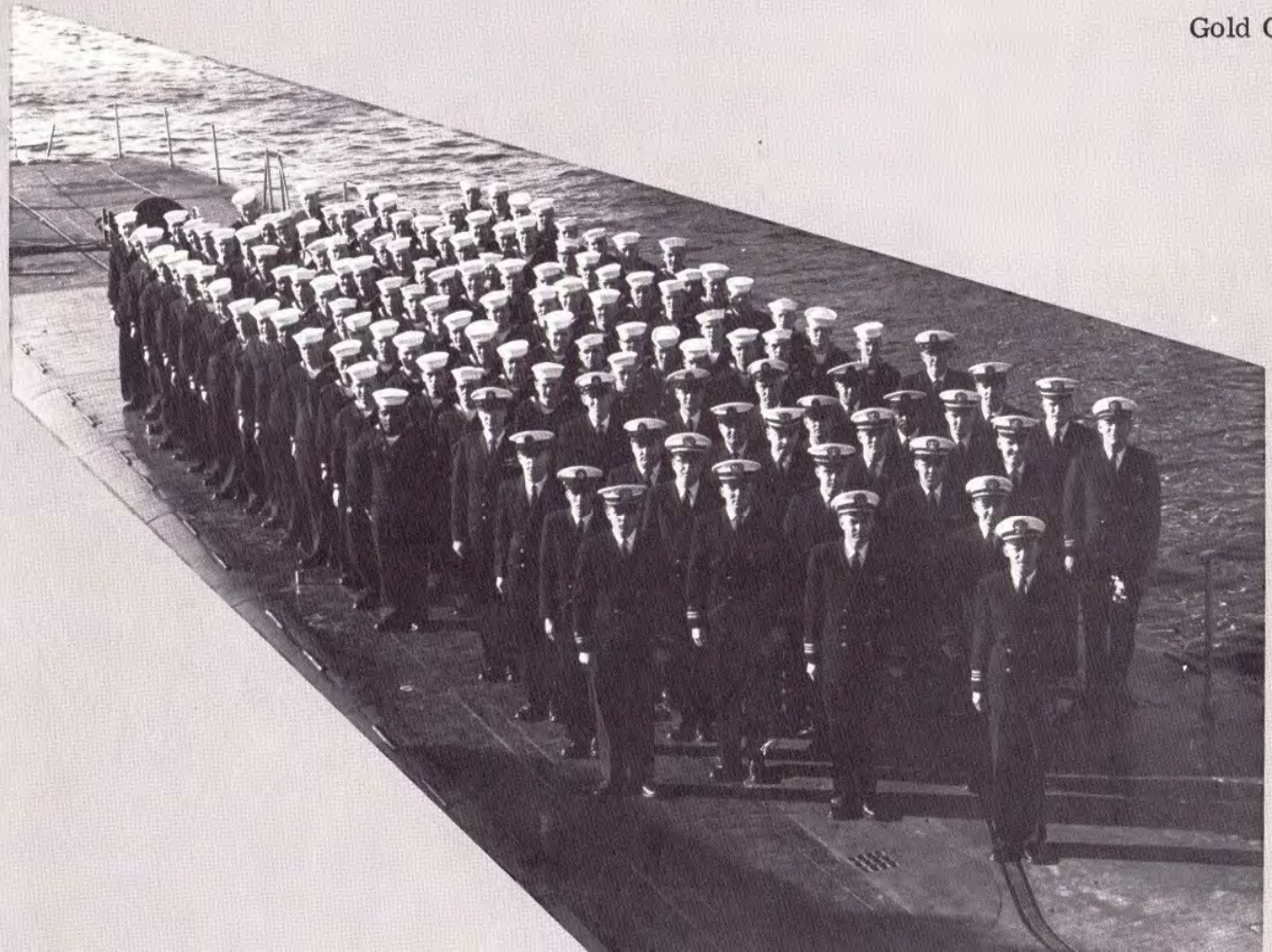
LCDR R. D. Griffiths, USN ..... Executive Officer
LT(MC) A. P. Belmont, USN ..... Medical Officer
LTJG J. J. Buggy, Jr., ... Electrical Officer
LT W. Cavanaugh, III, ... Main Propulsion Assistant
LT C. M. Fink, USN ..... Damage Control Assistant
LT J. P. Kennedy, USN ..... Operations Officer
LT D. C. Klinger, USN ..... Supply and Sonar Officer
LT L. K. Letteney, USN ..... Assistant Weapons Officer
LCDR J. R. Poole, USN ..... Weapons Officer
LT J. A. Schmidt, USN ..... Engineer Officer
LT R. L. Sminkey, USN ..... Navigator
LTJG T. W. Turner, USN ..... Assistant Engineer
LTJG R. T. Vickers, USN ..... Food Services Officer

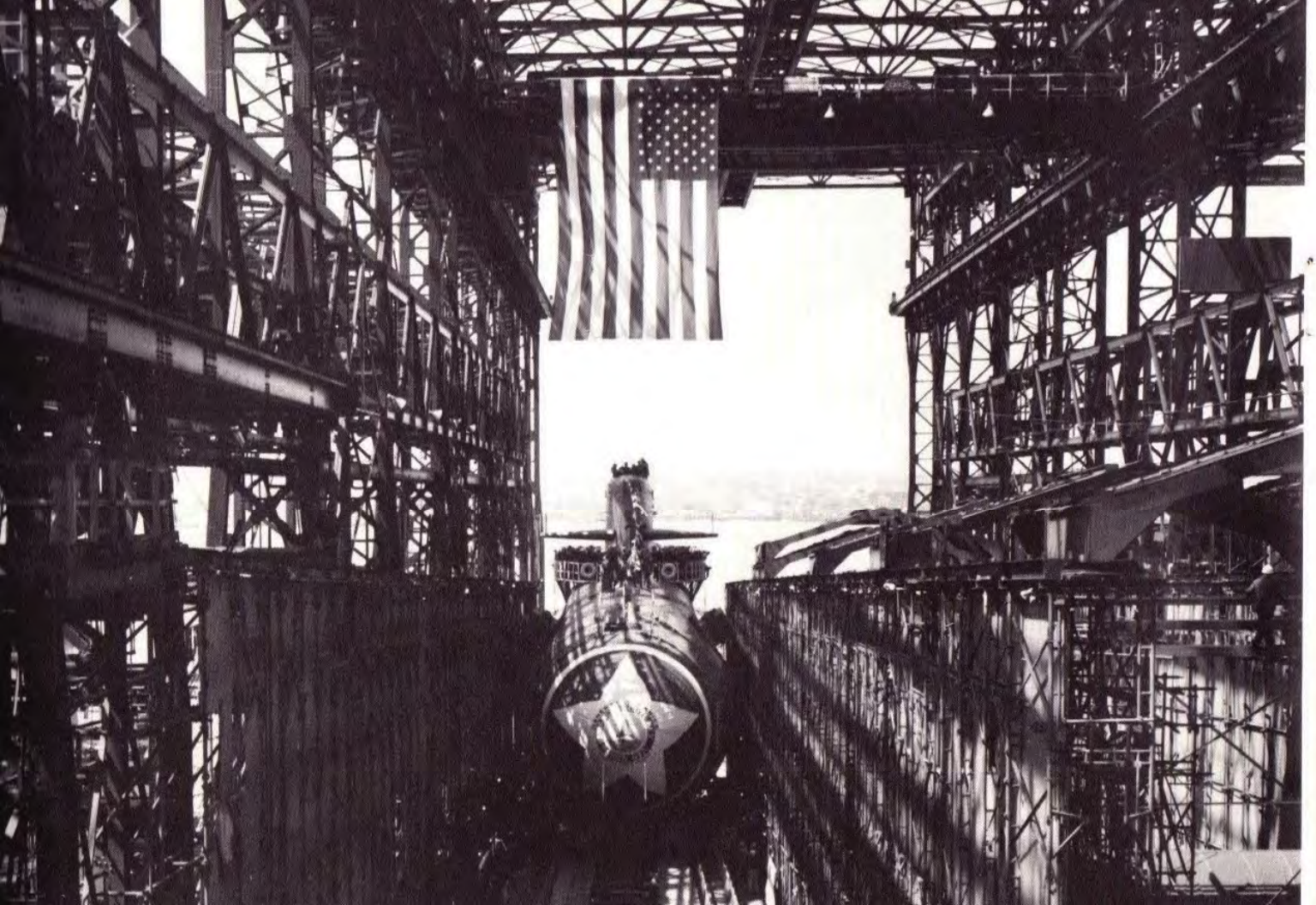
CHIEF PETTY OFFICERS

Graves, J. C., HMC(SS)
Hansen, W. A., ETC(SS)
Isom, R. H., RMC(SS)
Kuykendall, R. A., FTGC(SS)
Lee, W. D., SKC(SS)
Mustin, J. O., TMC(SS)
Robertson, D. R., EMCS(SS)
Robinson, R. S., ICC(SS)
Russell, F., MMC(SS)
Savage, J. B., SPCM(SS)
Seader, L. A., QMC(SS)
Segan, R. H., YNC(SS)
Spaulding, R. L., CSC(SS)
Stebbins, T. J., QMCM(SS)
Vincent, C. J., ETC(SS)
Vincent, D. A., ENC(SS)

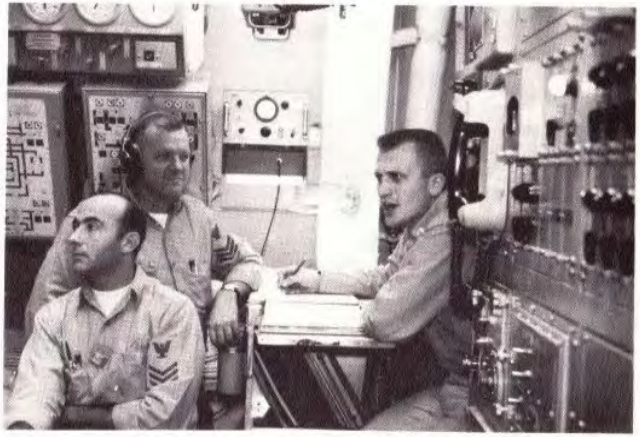
ENLISTED PERSONNEL

Allen, B. D., STS3(SS)
Anderson, W. G., Jr., MM2(SU)
Atkins, E. F., TM1(SS)
Barker, R. D., SK1(SS)
Barnhart, J. A., ETN2(SS)
Barth, N. C., MT2(SS)
Bird, S. D., MM3(SU)
Borrell, M. L., Jr., MM1(SS)
Bowen, J. H., QM2(SS)
Bresaw, T. F., ETR2(SU)
Calabria, J. C., FTG2(SS)
Campbell, O., CS1(SS)
Carlson, W. A., EM2(SS)
Carpenter, W. C., MM1(SS)
Carter, W. R., TM2(SS)
Clark, R. J., EM3(SS)
Clarke, R. A., Jr., ET1(SS)
Dappen, R. G., ETR3(SU)
Davenport, M. E., TM1(SS)
Dougherty, T. R., IC2(SU)
Driscoll, J. W., EM2(SS)
Dumas, R. D., ETR2(SS)
Engler, D. L., MM2(SS)
Evering, E. L., MM2(SS)
Fong, S. "Y", QM2(SS)
Foster, E. M., TM3(SS)
Fravel, D. H., Jr., EN2(SS)
Gasser, G. R., ETR2(SS)
Giles, D. A., ETR2(SS)
Gonzales, P. L., RM2(SS)
Greene, R. T., FA(SU)
Griesbaum, J. M., IC3(SU)
Guinn, D. R., CS1(SS)
Haigh, F. J., TM3(SS)
Harrison, G. F., MM2(SU)
Hausken, O. J., MM2(SS)
Heflin, J. L., TM3(SU)
Herman, S. J., SN(SU)
Hess, H. W. III, FTB3(SU)
Hobbs, C., TM1(SS)
Holdway, W. G., MT3(SU)
Hooks, G., CS2(SS)
Howard, C. T., SA(SU)
Jewell,D. F., IC1(SS)
Johnson, C. L., STS2(SS)
Johnson, C. D., MM2(SU)
Jolly, M. E., ET1(SU)
Kelley, C. D., II, IC1(SS)
Kieft, G. F., ETR2(SS)
Kringlie, F. D., ETN2(SS)
LaChapelle, G. M., MT2(SU)
LaCrosse, R. L., FTB3(SU)
Lafferty, P. E., MT2(SU)
Leahy, T. J., RM1(SS)
Lewis, B. R., MT3(SU)
Little, T. H., FTB2(SS)
Lightcap, W. R., Jr.,SN(SU)
Louthain, P. W., MM3(SU)
Lundell, J. A., EN2(SS)
Mahany, V. T., IC2(SS)
Martin, C. H., MM1(SS)
McAllister, R. A., FTB1(SS)
McCleer, J. L., MM1(SS)
McLeod, M. M., EM1(SU)
Miller, R. L., ETN2(SS)
Miner, T. W., RM3(SS)
Mond, R. B., MM2(SU)
Moore, R., III, EM1(SS)
Morgan, M, MM2(SU)
Moxley, G. N., Jr., FA(SU)
Nason, F. W., III, MM2(SS)
Nix, D. E., IC2(SU)
Norris, J. W., Jr., ENFA(SU)
Opdycke, J. R., Jr., FTB3(SU)
Penna, C. J., MM1(SS)
Perkins, W. L., ST1(SS)
Perks, W. E., Jr., MM3(SU)
Perry, M. J., ET1(SS)
Reynolds, A. J., Jr., ET1(SS)
Ringer, B. E., FN(SU)
Ripley, W. M., MM2(SS)
Robles, G., YN2(SS)
Ruckert, H. W., ST1(SS)
Salisbury, G. M., STSSN(SU)
Salvato, H. E., SN(SU)
Scanlon, M. F., MT3(SS)
Schumacher, J. A., FA(SU)
Scrivens, C. R., QM1(SS)
Sibucao, A. V., TN(SS)
Smith, D. L., Jr., RMSN(SU)
Sorensen, L. D., MM1(SS)
Sperry, T. L., EM2(SS)
Stopen, D. C., ETN2(SS)
Swanson, T. A., Jr., ET1(SS)
Thrasher, R. W., TN
Tommy, B. L., EN1(SS)
Traywick, B. "R", SA(SU)
Trubee, J. A., MM1(SS)
Ubelhoer, D. R., ETN2(SS)
Valentine, E. J., TM1(SS)
VanCamp, E. B., MT1(SS)
Venzon, E. M., SD1(SS)
Walters, G. J., MMFN(SU)
Warner, L. D., MT2(SS)
Williams, L., RM1(SS)
Willson, E. T., FTB2(SS)
Wise, T. V., EN3(SS)
Zimmerman, G. A., MM2(SU)





Periscope Stand



Maneuvering Room

Navigation Center

Torpedo Room

Missile Launch Center

Missile Compartment

Missile Control Center

Communications Center

Crew's Lounge

Ship's Galley

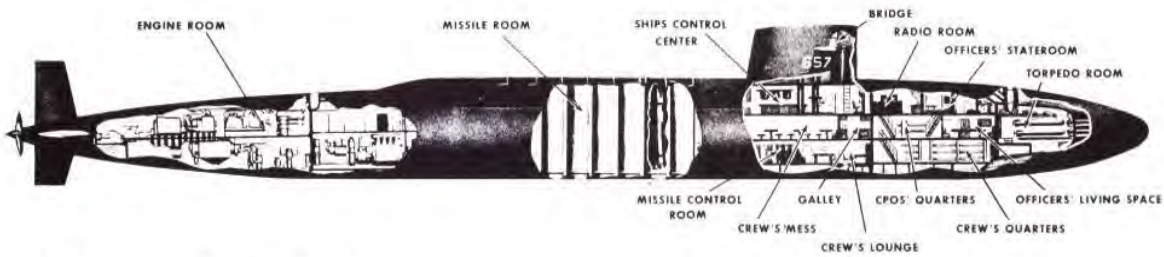
Crew's Mess

Chief's Quarters

THE FLEET BALLISTIC MISSILE SUBMARINE

The decade immediately following World War II saw a great change in the political power structure of the world. The United States changed its wartime role as "Arsenal of Democracy" to the "Bulwark of Freedom" in the cold war. To meet the challenge of the new role, new weapons systems were needed.

In January 1954, the USS NAUTILUS announced to the world that she was "underway on nuclear power." The vehicle for an advanced weapons system was complete. An undersea craft which is silent, fast, highly maneuverable, and capable of fighting a war the length of World War II without refueling was available.



NAVIGATION SYSTEM

Two positions must be known for success in missile launching — target and launcher. This places great importance on navigation since the position of the launcher is the position of the ship and is continuously changing. Several navigational methods complement each other in the FBM submarine to provide a very high order of accuracy in determining ship's position. At the heart of the system is the Ship's Inertial Navigation System (SINS) which integrates ship motion, speed, and headings to give a continuous report of ship's position. The ship has two SINS, each checking the other. Similar systems guided NAUTILUS and SKATE on their historic voyages beneath the polar ice in 1958, TRITON on her 84 day underwater cruise around the world, and more recently, SEA DRAGON and SKATE in their rendezvous at the North Pole in summer of 1962.

TRAINING

The average pre-commissioning training period of FRANCIS SCOTT KEY personnel is about 18 months. From several weeks to a year is devoted to formal schooling in radio, sonar, navigation, fire control, weapons or engineering. After a thorough grounding in such items as transistors, electronic circuitry, Boolean logic, digital computer theory, hydraulics, and nuclear physics, FRANCIS SCOTT KEY Personnel receive intensive training in the maintenance of integrated systems. The training program continues at sea, and on shore off crews are provided with training facilities in the home port of the various SSBN Squadrons.

COMMUNICATIONS

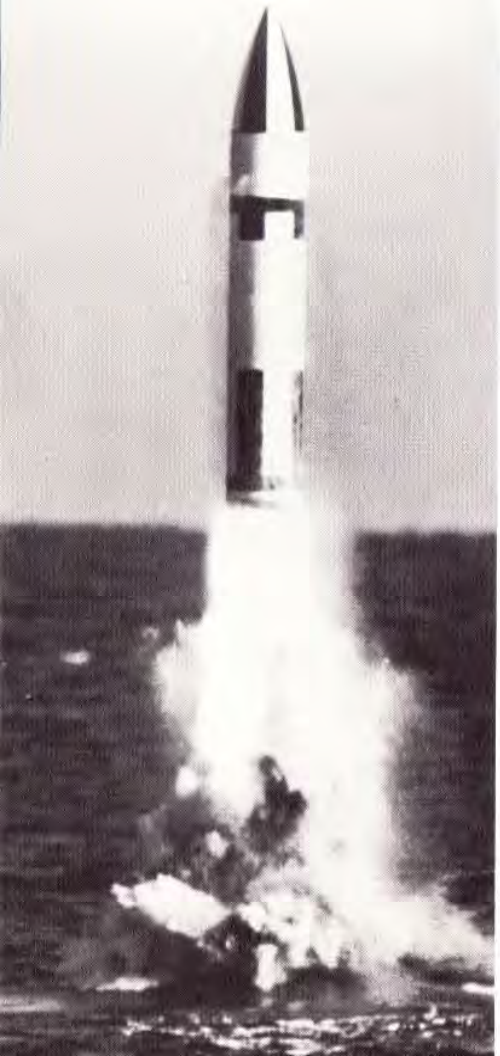
Radio communications with submerged submarines have been possible for a number of years. The systems used have been devised with special care to protect the locations of the submarines and leave the advantage of concealment unimpaired. Recent tests have again demonstrated that the Navy's worldwide communication system has the power and coverage necessary to exercise command of the always-submerged Fleet Ballistic Missile submarine.

SUPPLY

To support the intricate systems in KEY the Supply Department maintains a variety of spare parts which number about 95% of the range of different spares stocked aboard an aircraft carrier. The Supply Department also stores and prepares the variety and quality of food and baked goods normally found in a good hotel. All of these jobs are done with a handful of men and in very limited space.

FIRE CONTROL

The fire control system feeds a wealth of coordinated information to the missile guidance system. Ship location, local vertical, true north heading, target location and trajectory to be flown are continuously supplied until the very instant of firing.



FLEET BALLISTIC MISSILE

The Fleet Ballistic Missile Weapon System, better known by the name of its missile, POLARIS has been operational since November 1960. USS GEORGE WASHINGTON (SSBN598) was the first POLARIS submarine do deploy on an operational patrol. The next four ships to join her were of the same class and carried the 1200 nautical mile range A-1 missiles. The later construction FBM submarines carry the second generation POLARIS, the 1500 nautical mile range A-2 missile. FRANCIS SCOTT KEY will carry the new third generation, 2500 nautical mile A-3 missile.

THE MISSILE

POLARIS, named for the North Star, is a two-stage ballistic missile powered by solid rocket motors.

The 2500 nautical mile range operational missile is designated the POLARIS A-3. It is about 32 feet long, about four and one-half feet in diameter, and weighs about 35,000 pounds. Each motor exerts thrust through four nozzles in the motor base.

MISSILE GUIDANCE

The inertial guidance system used in POLARIS is a refinement of earlier inertial systems and is the smallest in use in U. S. ballistic missiles. The guidance system puts the missile on correct course at the time of launch and automatically computes a new correct course should the missile deviate from its path. At the precise instant required, the guidance system triggers separation of the re-entry body from the missile. The re-entry body then follows a ballistic trajectory to the target.

MISSILE LAUNCHING

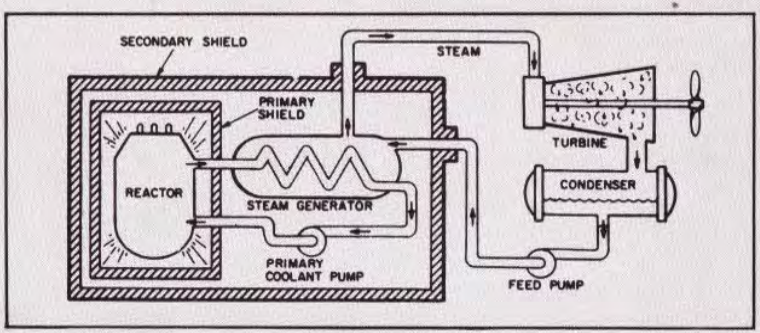
POLARIS missiles are launched by a gas-ejection system which forces the missile from its launching tube and propels it up through the water to the surface. At that point the rocket motor ignites and sends the missile on its way. The system takes advantage of the reliability of solid propellant fuel used in POLARIS. The result is increased safety for the submarine and crew. Vital parts of each missile are accessible for inspection and maintenance even when loaded in the launching tubes and while the submarine is underway at sea. Monitoring and necessary repairs are accomplished by the ship's crew so that the missiles are always ready.

MISSILE CONCEPT

With almost unlimited cruising range and with endurance limited only by the crew, the Fleet Ballistic Missile Submarine is capable of extended submerged operations in the international waters of the world which comprise about 70 percent of the earth's surface. Free of the need to surface or extend a snorkel above the surface, FBM nuclear submarines remain hidden by the ocean, their locations unknown to any potential enemy. The POLARIS missile, powered by solid propellant, is ready to launch within minutes of receiving the comand without the need for a long count-down. Mobile, hidden, ready for instant action (or carefully considered delayed action), the Fleet Ballistic Missile system provides the United States with a powerful deterrent to those who might start a global war.

VITAL STATISTICS

Keel Laid	5 December 1964
Launched	23 April 1966
Length	425 Feet
Beam	33 Feet
Commissioned	3 December 1966
Displacement Surfaced	about 7000 tons
Displacement Submerged	about 8200 tons
Speed Submerged	over 20 knots
Diving Depth	over 400 feet
Built by	Electric Boat division of General Dynamics

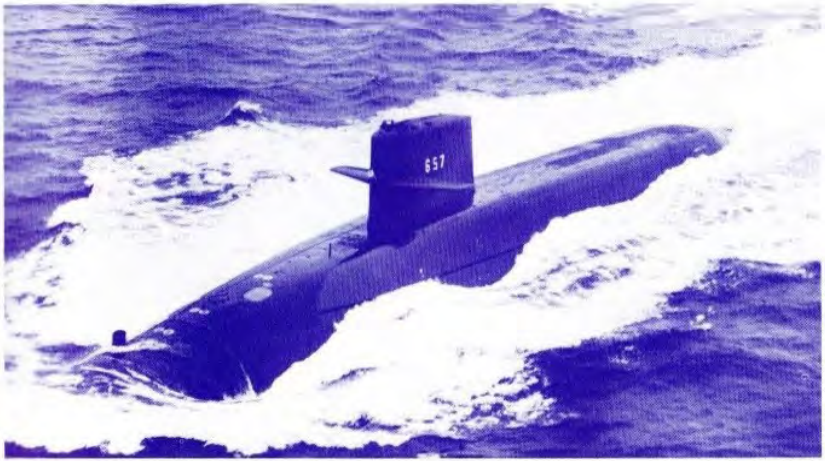


THE POWER PLANT

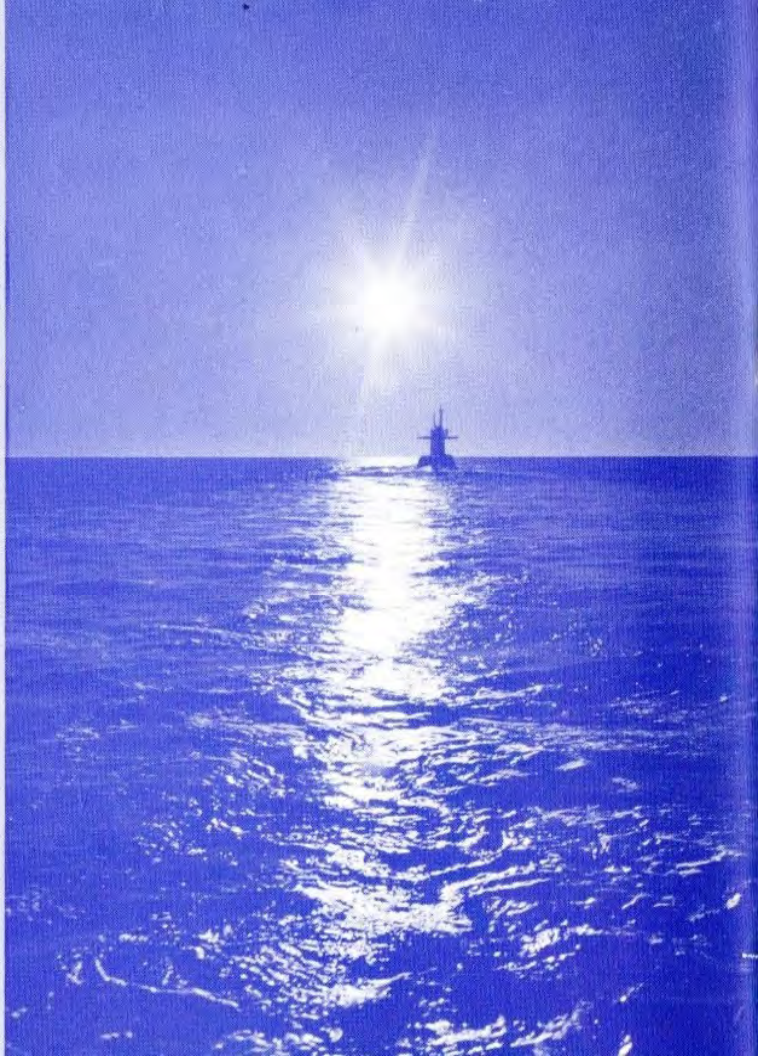
FRANCIS SCOTT KEY is powered by a nuclear power plant consisting of a nuclear reactor which provides heat for the generation of steam to drive the main propulsion turbines, for propulsion, and the ship's service turbogenerators for electric power. The primary system is a circulating water cycle and consists of the reactor, identical port and starboard loops of piping, primary coolant pumps and the tubes of the steam generators. Heat is produced in the reactor by nuclear fission and is transferred to the circulating primary coolant water which is pressurized to prevent boiling. This water is then pumped through the steam generator tubes where it transfers its heat to the shell or the secondary side of the steam generators and boils water to form steam. It is then pumped back to the reactor by the primary coolant pumps and reheated for the next cycle.

The secondary system is the steam producing cycle and is made up of the shell side of the steam generators, turbines, condensers, and steam generator feed pumps. It is compltely isolated from the primary system since the primary water goes through the tubes of the steam generator while the water which is boiling to make steam is on the shell side of the steam generator. Steam rises from the steam generators, then flows to the engineroom where it drives the ship's service turbogenerators which supply the ship with electricity and the main propulsion turbines which drive the propeller. After passing through the turbines, the steam is condensed and the water is fed back to the steam generators by the feed pumps. There is no step in the generation of this power which requires the presence of air or oxygen. This fact alone allows the ship to operate completely divorced from the earth's atmosphere for extended periods of time.

During the operation of the nuclear power plant high levels of radiation exist around the reactor and personnel are not permitted entrance into the reactor compartment until after the reactor is shut down. Heavy shielding is used to protect the crew so that the average crew member receives less radiation than he would receive from natural sources ashore.



SEA TRIALS

THE INSIGNE

The thirteen stars which dominate the periphery of The Insigne symbolize the thirteen original colonies. The flag on the right of the field represents the "Star Spangled Banner" which flew over Fort McHenry at the time of Francis Scott Key's historic penning of our National Anthem, while the one on the left presently flies "o'er the land of the free and the home of the brave!" In the foreground is a silhouette of the USS FRANCIS SCOTT KEY, one of the Navy's 41 Fleet Ballistic Missile Submarines which comprise this Nation's number one contribution toward world peace.