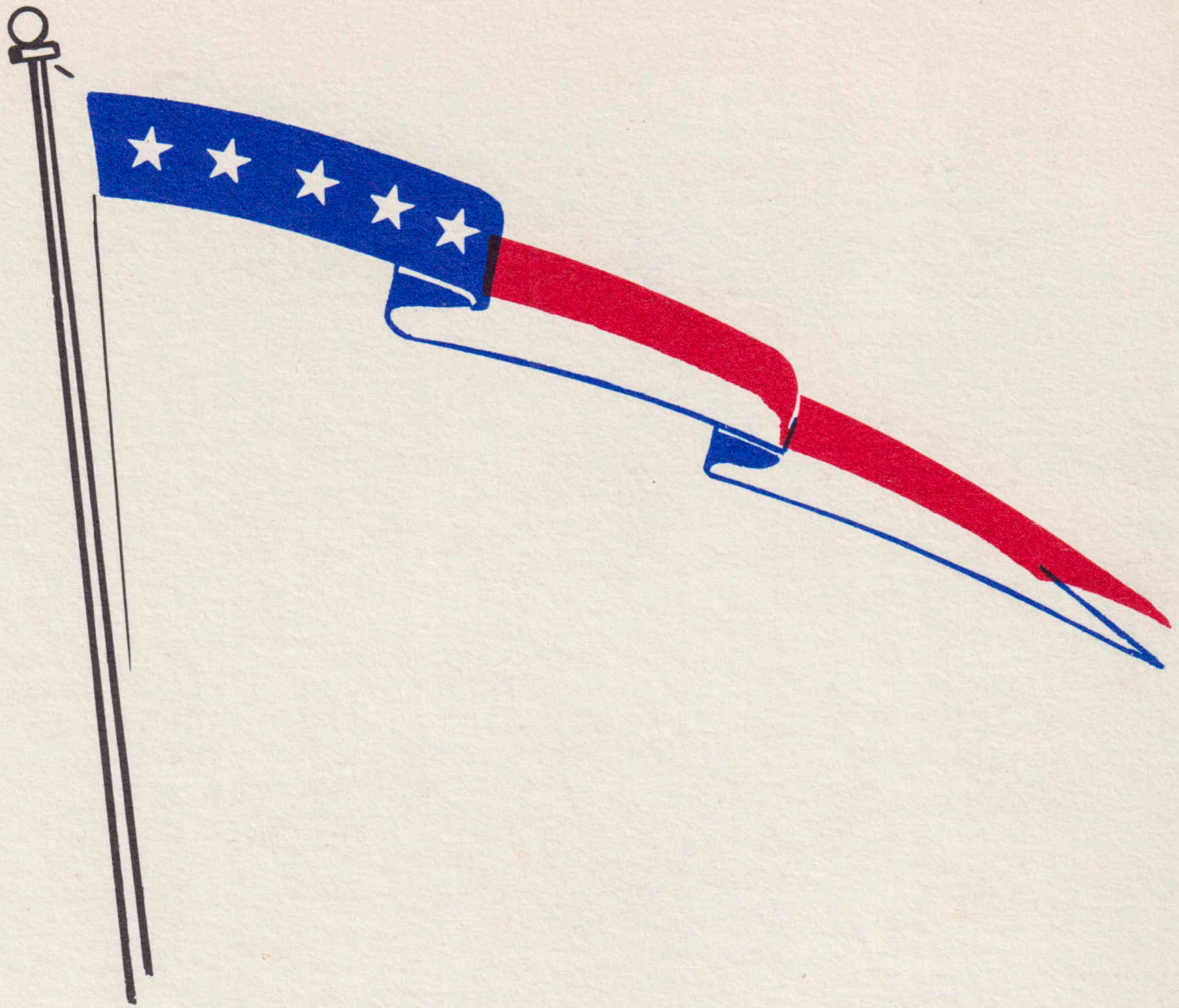


JAMES K. POLK



SSBN645



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 JAMES K. POLK (SSBN 645) 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 JAMES K. POLK (SSBN645)

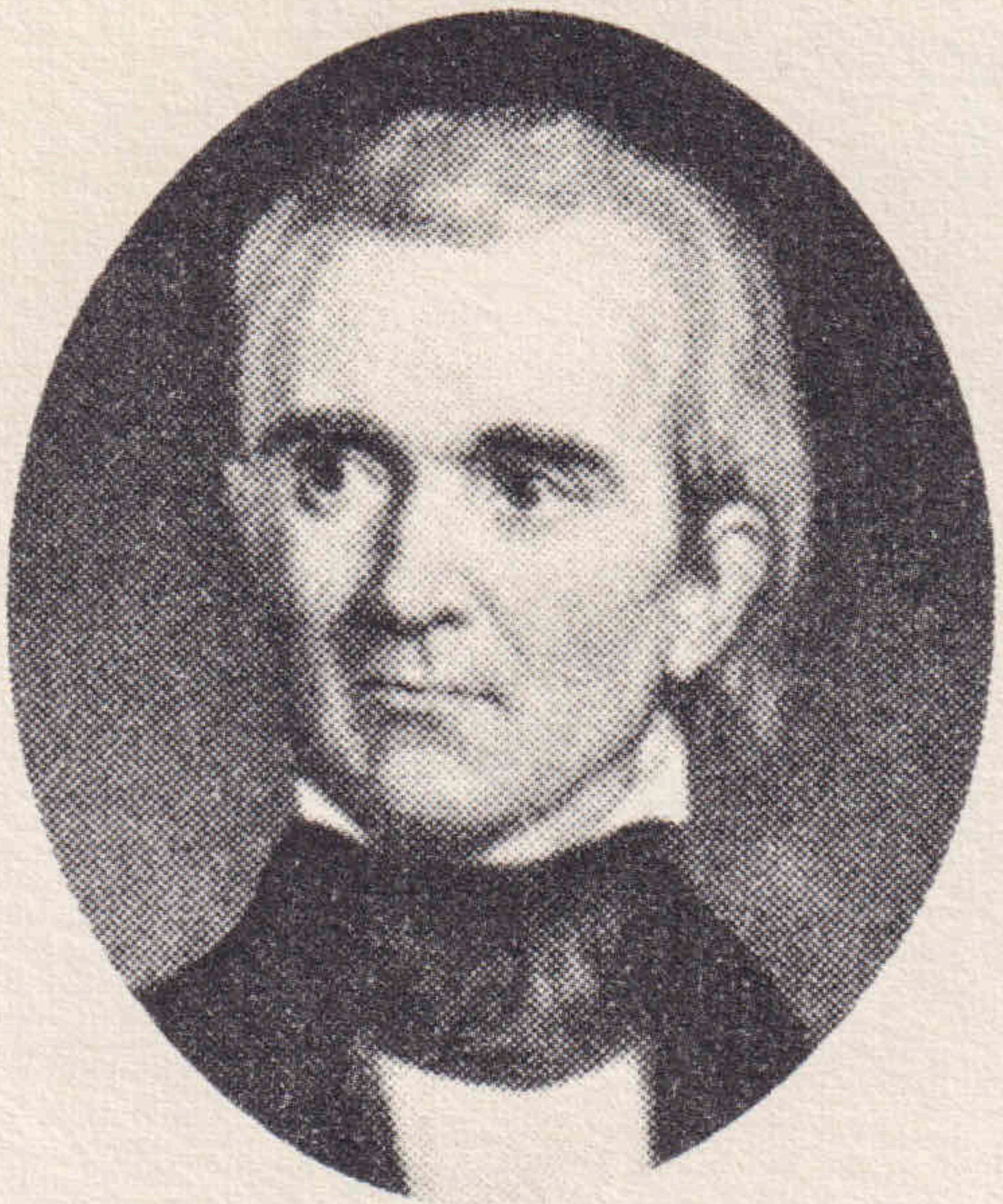


Built by
GENERAL DYNAMICS
Electric Boat Division

Keel Laid: 23 November 1963
Launched: 22 May 1965
Commissioned: 16 April 1966



Sponsor
Mrs. Horacio Rivero, Jr.



JAMES K. POLK

James Knox Polk, for whom the USS JAMES K. POLK (SSBN645) is named, was born to Samuel and Jane Knox Polk on November 2, 1795, in Mecklenburg County, North Carolina and eventually became the eleventh president of the United States. During his distinguished career he was also a U. S. Congressman, Speaker of the House of Representatives, and Governor of Tennessee.

During his younger years Polk was not in good health and only received a limited education because of the limited facilities in his pioneer community. However, at age 18, he attended Murfreesborough Academy where his literary merit and moral worth won the approval of the rector and in 1815 he entered the University of North Carolina. Polk was graduated from the University in 1818 and enjoyed the distinction of being awarded first honors in both mathematics and the classics. Early in 1819 he began the study of law in the office of Judge Felix Grundy and was admitted to the bar in 1820. In 1823 he was chosen to represent his county in the state legislature, and, having thus entered the political arena, he continued in a very active, and for the most part successful, political career to the close of his term as President (1845-1849).

As the youngest President up to that time, Polk had a distinguished record of accomplishments. The western border of the United States was pushed to the Pacific adding to this country what is now Texas, California, Oregon, Arizona, Nevada, Utah, New Mexico, Washington, Idaho and parts of Montana, Wyoming and Colorado. He also settled the Oregon boundary dispute with Great Britain, and established an independent treasury system. By his assertion of the "Polk Doctrine" he made the American continent safe for democracy by repelling with all vigor interference by European powers. Seldom in our history has such an ambitious program been carried into effect in the brief span of four years.

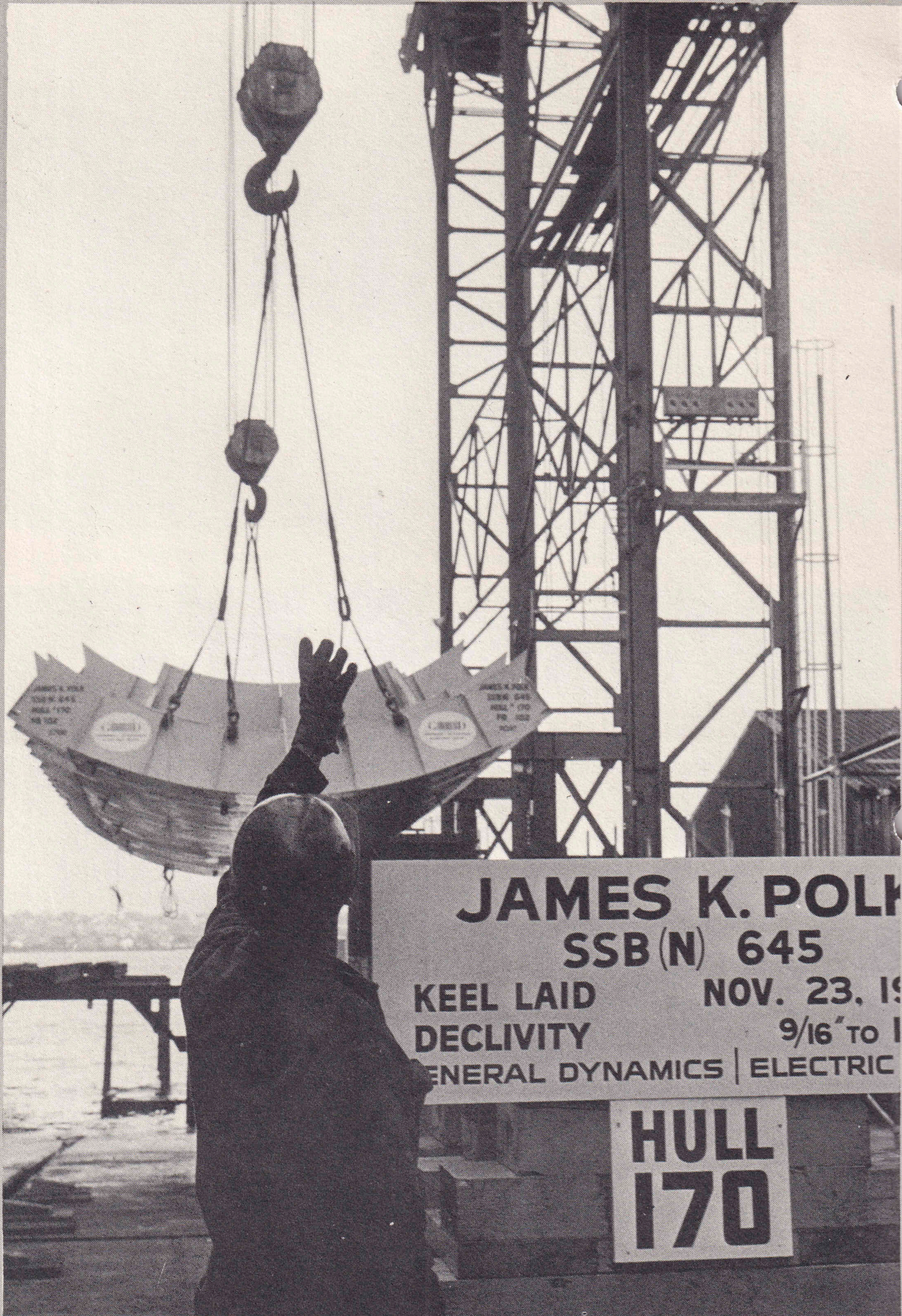
In spite of all this he has remained relatively forgotten notwithstanding the fact that his tariff policy led to prosperity; that his treasury system proved successful; that his "Polk Doctrine" has been approved and extended; and that his expansion policy added over five hundred thousand square miles of territory and gave the United States free access to the Pacific Ocean.

During his administration a formal course of education and preparation for Naval Officers at the United States Naval Academy was founded in 1845.

Polk was truly a constructive statesman, an unusually able executive, and a sound patriot who "planted the laws of the American Union on the shores of the Pacific."



CHRISTENING 22 May 1965



JAMES K. POLK

SSB(N) 645

KEEL LAID

NOV. 23, 1963

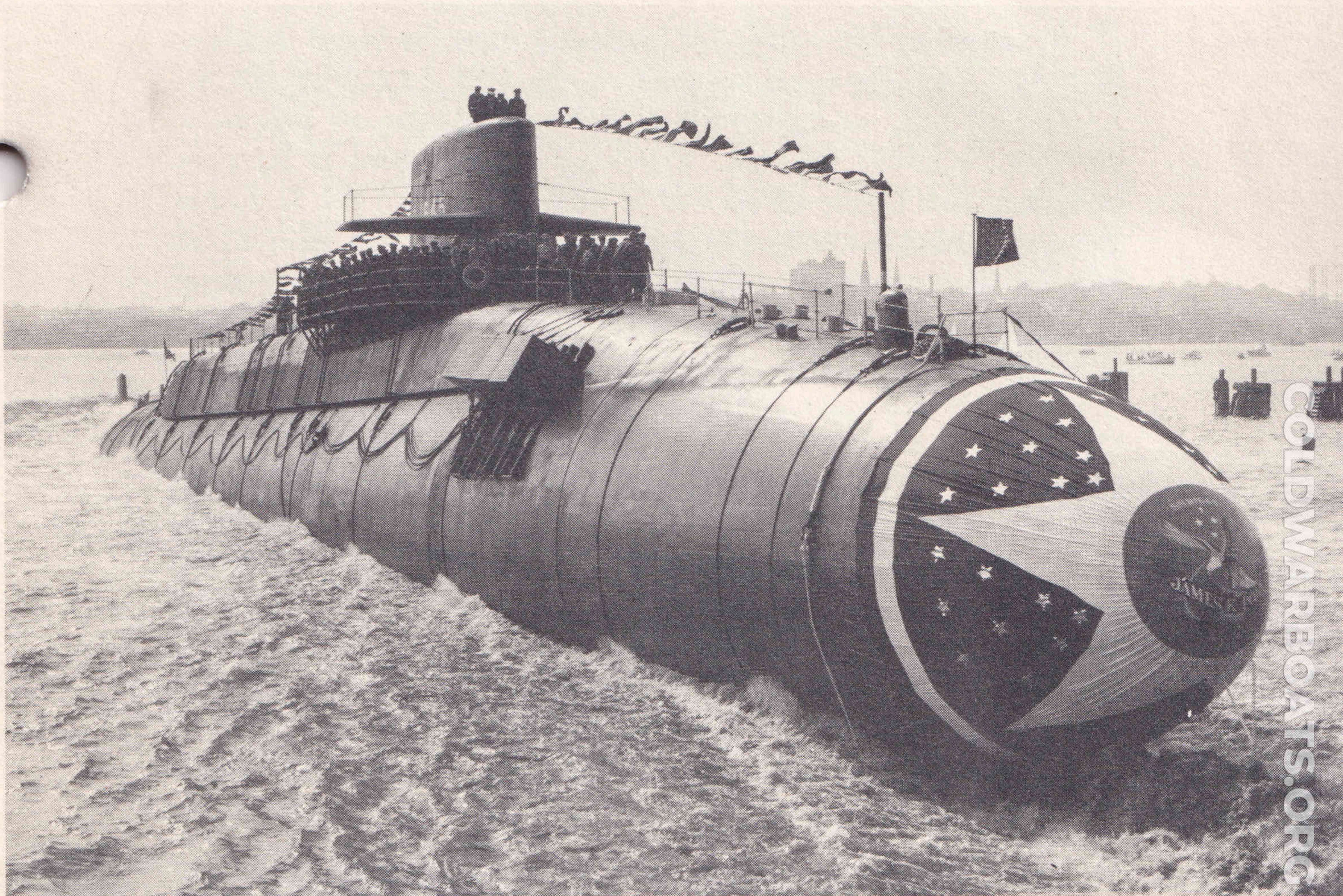
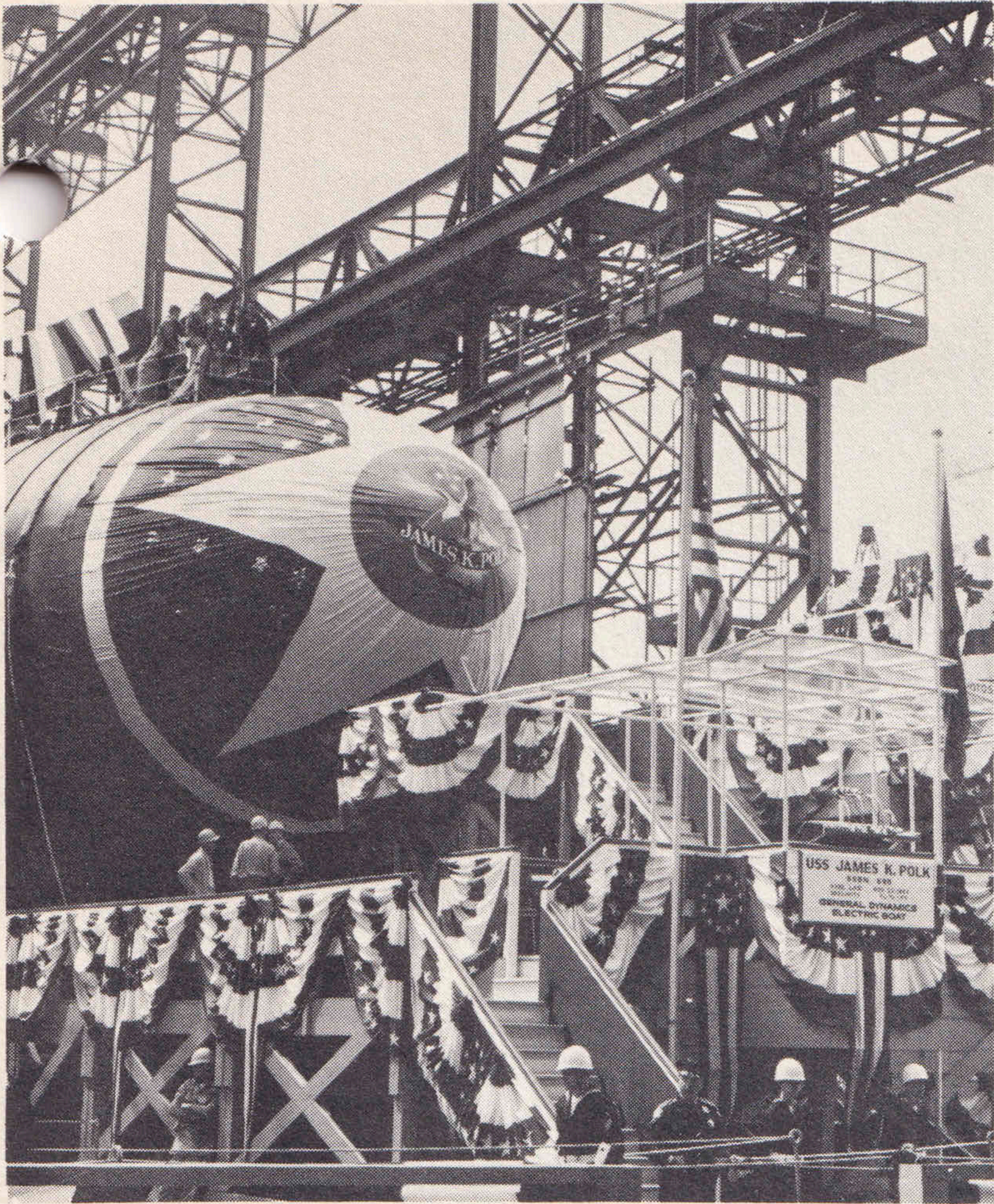
DECLIVITY

9/16" TO 1"

GENERAL DYNAMICS | ELECTRIC

**HULL
170**

KEEL LAYING 23 November 1963



LAUNCHING 22 May 1965



CDR. F. D. McMULLEN, USN
PROSPECTIVE COMMANDING OFFICER
BLUE CREW

Commander MC MULLEN graduated from the Naval Academy in 1946. After serving three years on the USS ASTORIA (CL90) he attended basic submarine school and was subsequently ordered to the USS DIODON (SS349). Following this he served as Squadron Communication Officer on the staff of COMSUBRON TEN. In August 1953 he attended George Washington University and received an M.B.A. degree following which he was ordered to the Bureau of Naval Personnel.

From its commissioning in August 1956 until June 1958 he served as the Executive Officer on the USS DARTER (SS576) and then became Commanding Officer of the USS HARDHEAD (SS365). Commander MC MULLEN attended Nuclear Power School and the U. S. Naval Guided Missile School (Polaris). In May 1960 he became Executive Officer of the USS ABRAHAM LINCOLN (SSBN602) and in June 1962 became Commanding Officer of the USS PATRICK HENRY (SSBN599) (BLUE), where he served for five polaris patrols. In December 1964 he reported to the USS JAMES K. POLK (SSBN645) as Prospective Commanding Officer (BLUE).

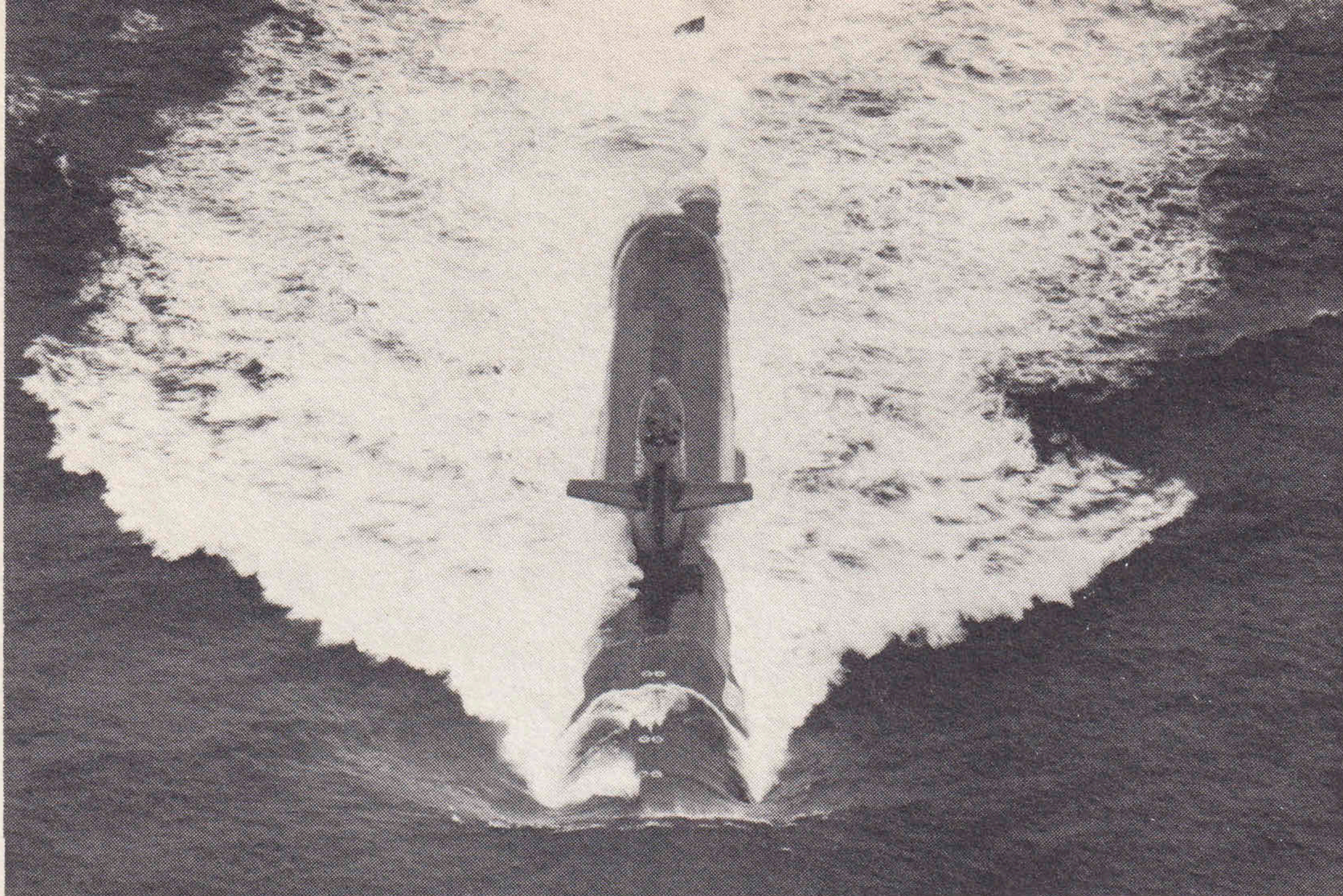
Commander MC MULLEN is married to the former Ruth Wheeler Hubbard of Washington, D. C. They have three children, Frank, Christine and Charles.



CDR. R. M. DOUGLASS, USN
PROSPECTIVE COMMANDING OFFICER
GOLD CREW

Commander DOUGLASS graduated from the Naval Academy in 1949. After a two year tour of duty on the USS RUPERTUS (DD851) he reported to the Submarine School. He was then assigned to the USS ARGONAUT (SS475) and then subsequently to the Engineering Department of COMSUBDIV 21. In 1956 he attended Nuclear Power School and following this attended Nuclear Prototype Training at Arco, Idaho. Subsequent assignments included duty on USS SARGO (SSN583) and USS PATRICK HENRY (SSBN599). In 1962 Commander DOUGLASS went to the Division of Reactor Development, AEC in Washington, D. C. for three months. For the next three years he was Commanding Officer of USS SARGO (SSN 583) and then went to the Naval Guided Missile School. In October 1965 he reported to the Precommissioning Unit of the USS JAMES K. POLK (SSBN645) as the Prospective Commanding Officer (GOLD).

Commander DOUGLASS is married to the former Marilyn Smith of Anoka, Minnesota. They have two children Jeffrey and John.



USS JAMES K. POLK (SSBN645)

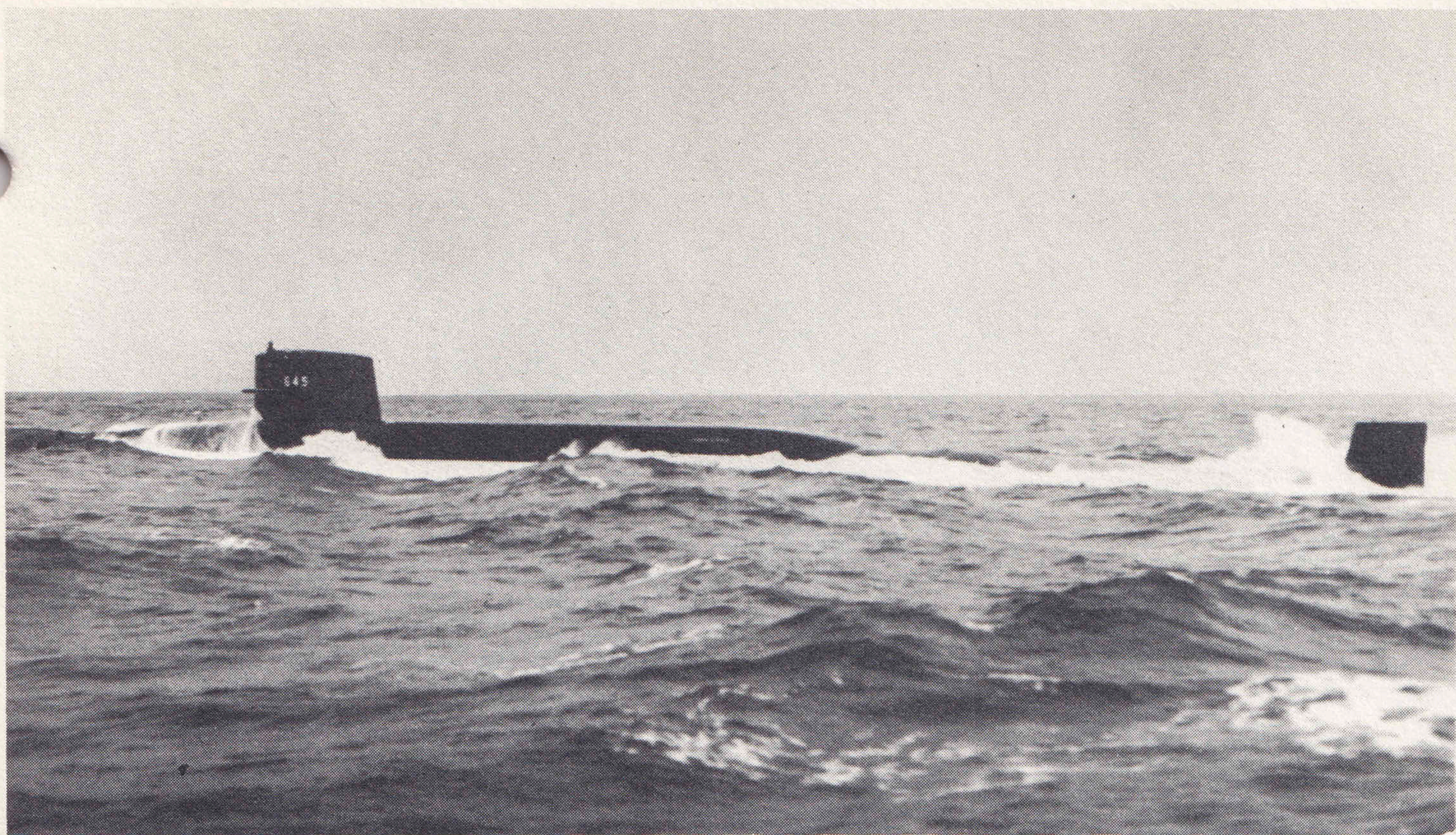
The USS JAMES K. POLK (SSBN645) is the Navy's 57th nuclear powered submarine and the 35th of its Polaris submarine fleet. The ship is 425 feet long with a beam of 33 feet and displaces approximately 8,000 tons submerged.

JAMES K. POLK began her waterborne career on May 22, 1965 when she was launched at General Dynamics Corporation's Electric Boat Division at Groton, Connecticut. Ten months later on March 13, 1966 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.

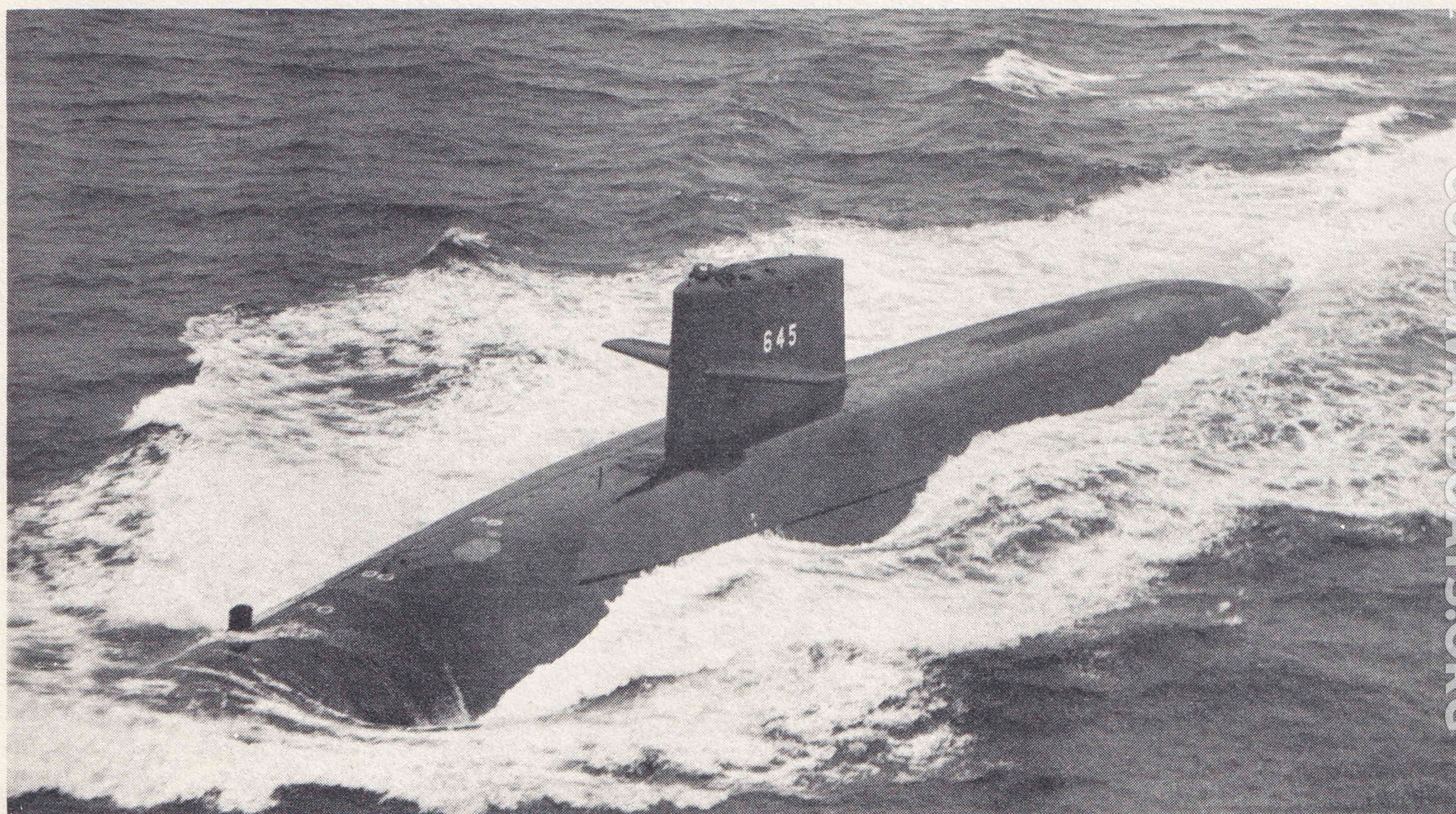
Fast, silent and virtually immune to surprise attack, the JAMES K. POLK combines the almost unlimited endurance of nuclear power with the deterrent might of 16 A-3 Polaris missiles capable of wreaking more havoc than all the bombs of World War II. These missiles have a range of about 2,500 nautical miles 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.



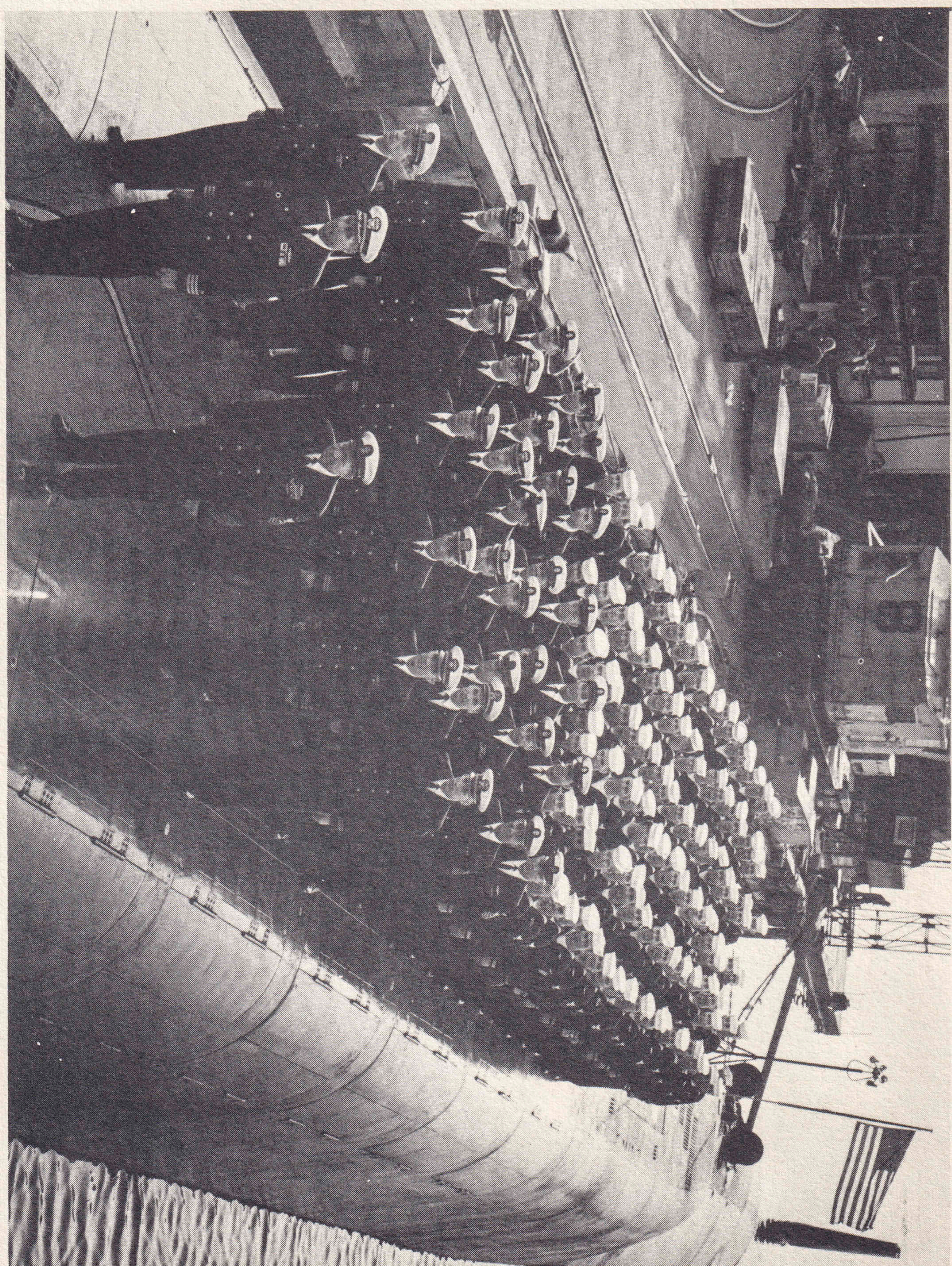
SEA TRIALS

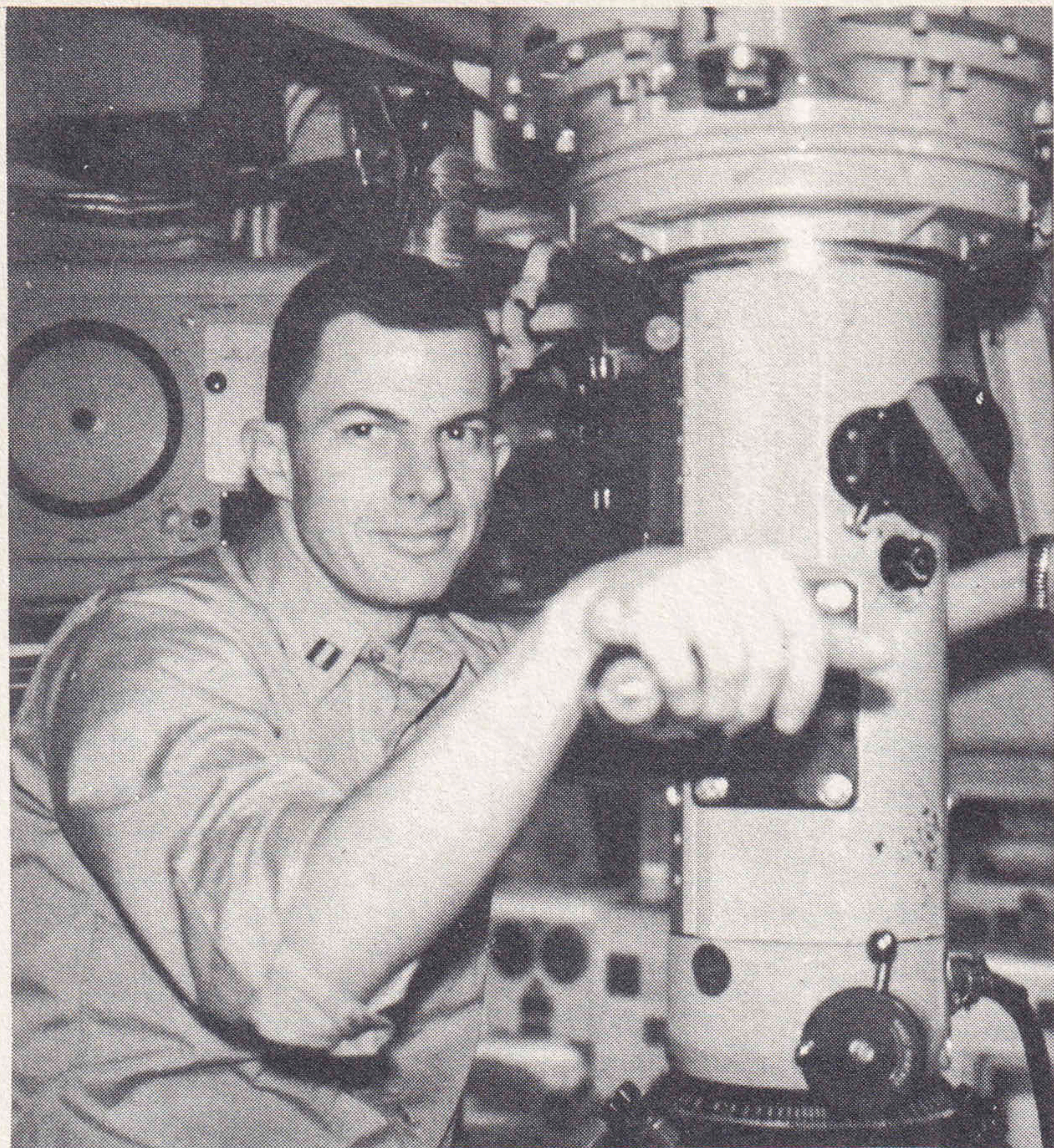


BLUE CREW

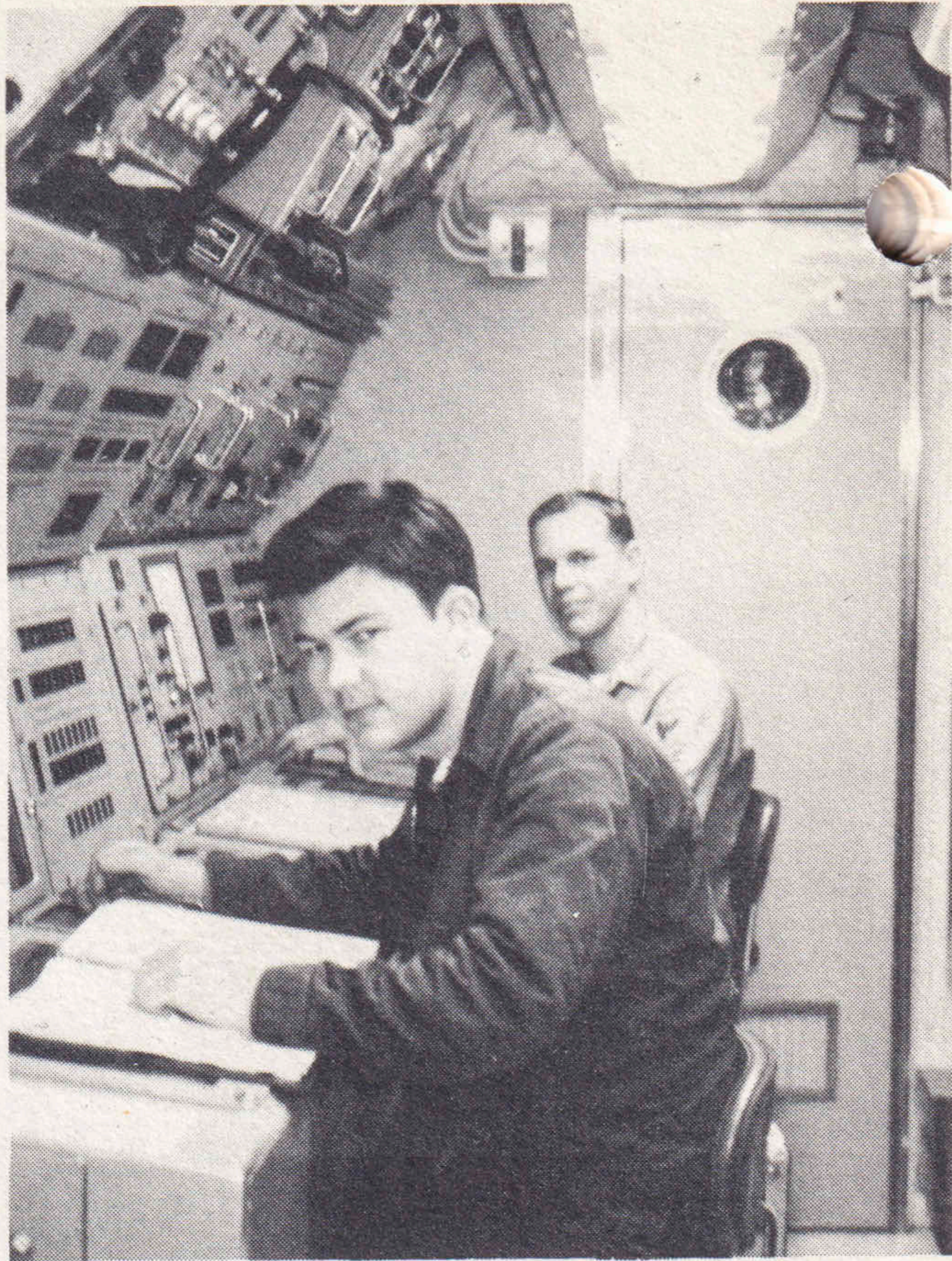


GOLD CREW

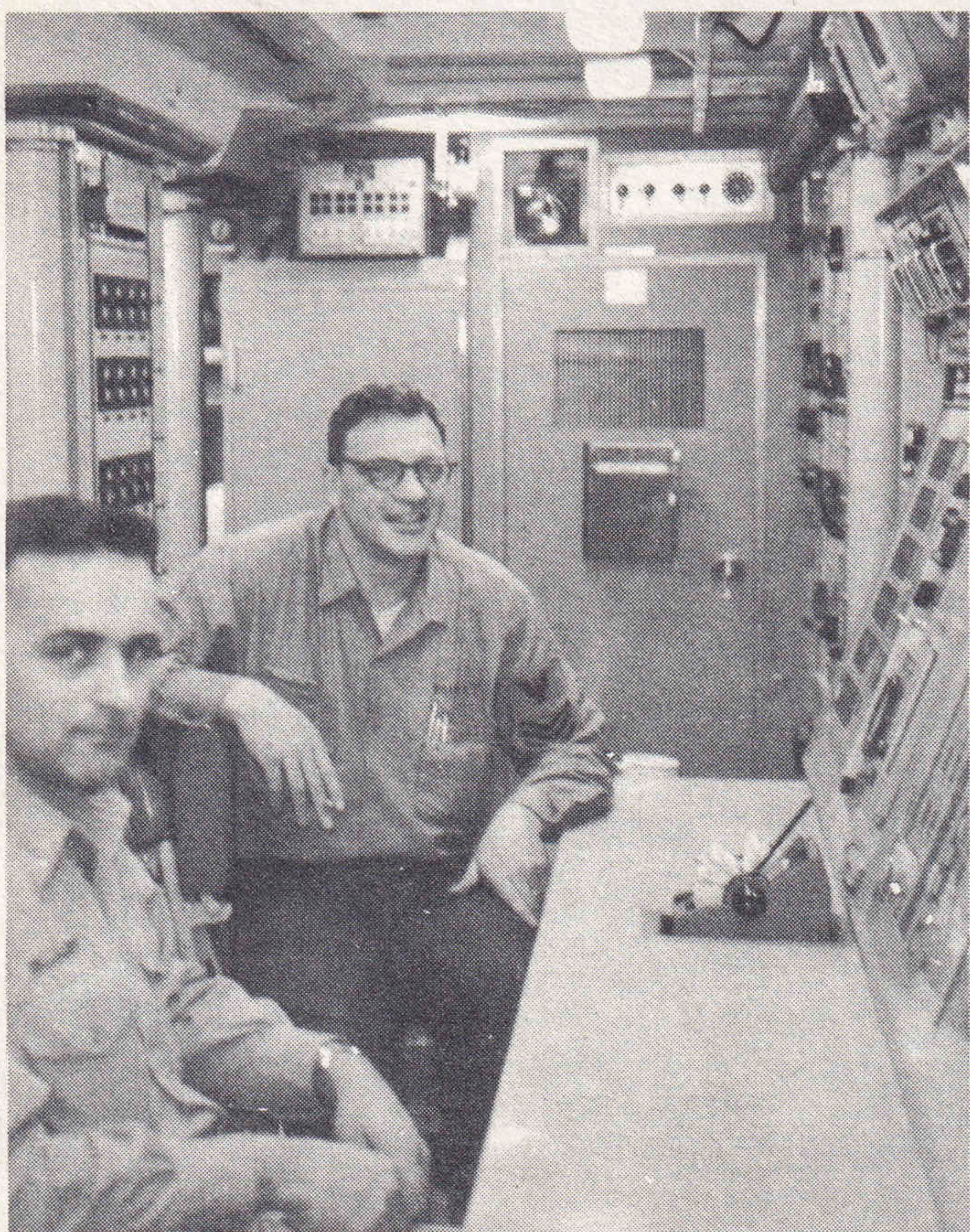




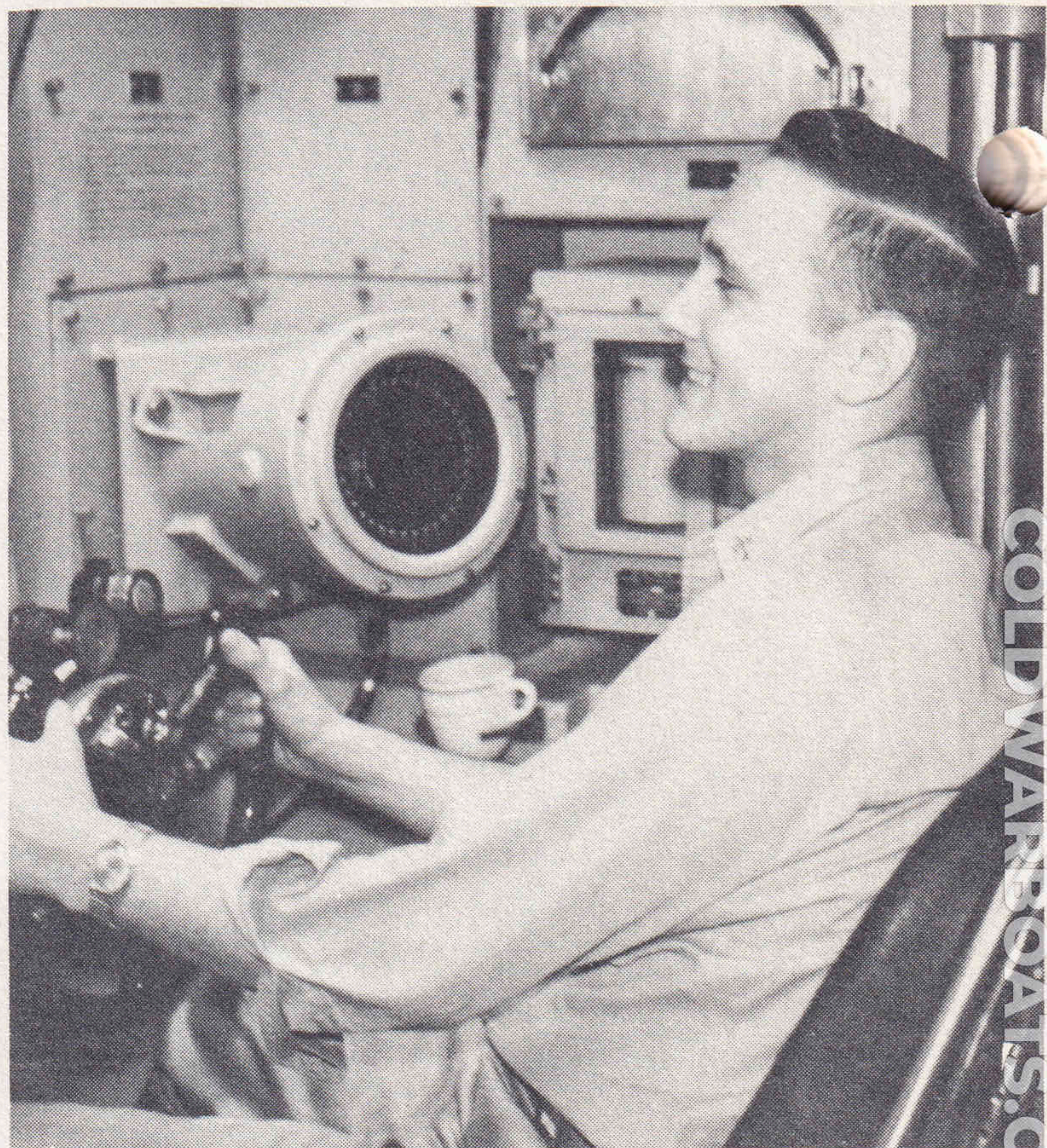
Periscope Stand



Diving Stand



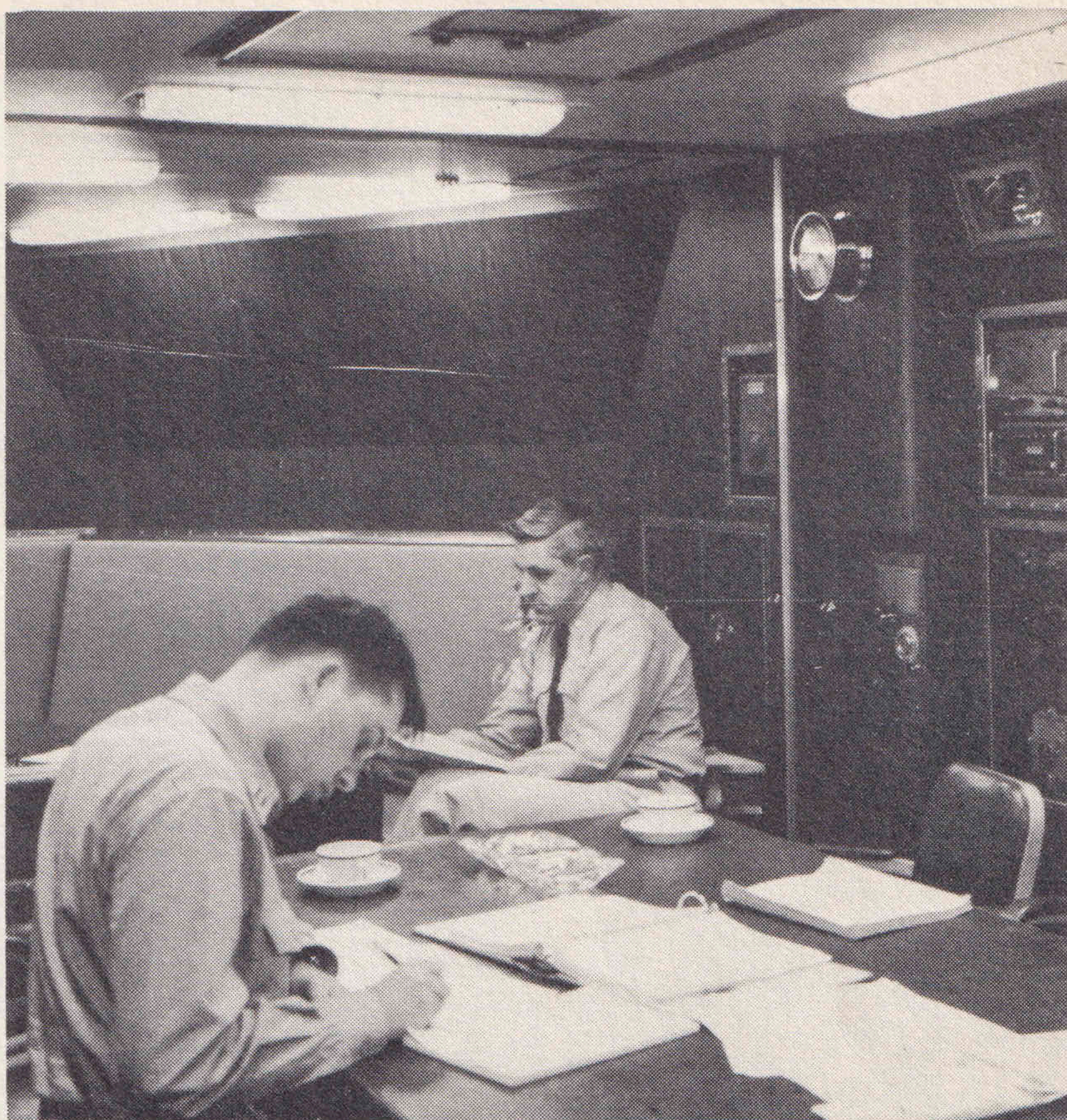
Missile Control Center



Navigation Center



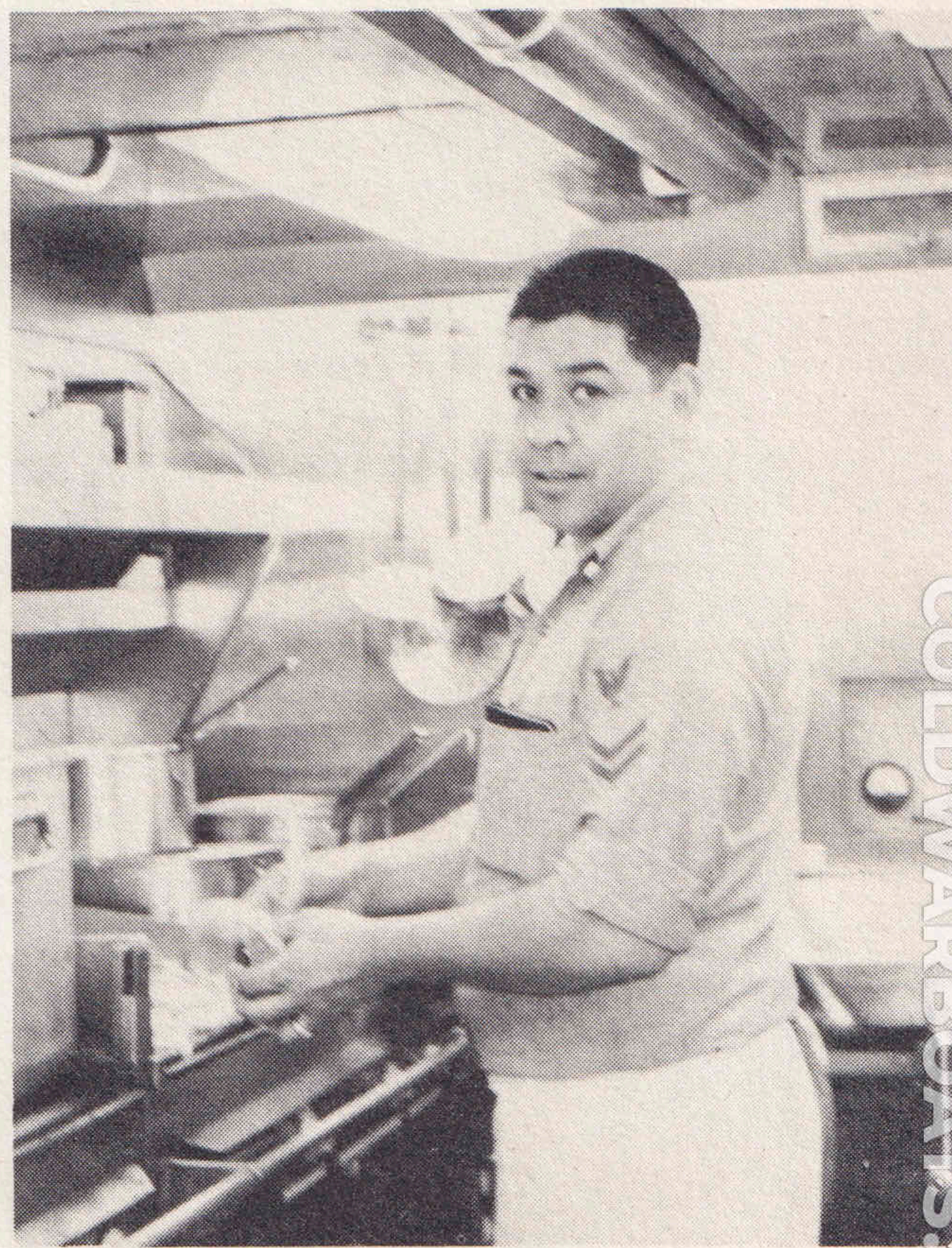
Missile Compartment



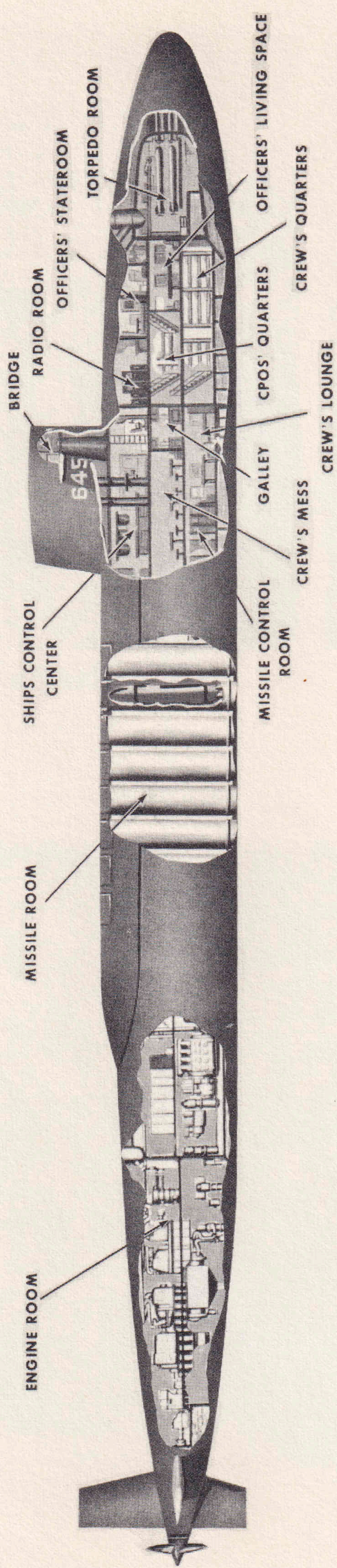
Officers Wardroom



Crew's Mess



Galley



USS JAMES K. POLK (SSBN645)

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 three SINS, each checking the others. 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 the summer of 1962.

TRAINING

The average pre-commissioning training period of POLK personnel is about 18 months. From several weeks to a year is devoted to formal schooling in radio, sonar, navigation, fire control, weapons and engineering. After a thorough grounding in such items as transistors, electronic circuitry, Boolean logic, digital computer theory, hydraulics, and nuclear physics, POLK 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 POLK, 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 (SSBN-598) was the first POLARIS submarine to deploy on an operational patrol. The next four to join her were of the same class and carried the 1,200 nautical mile range A-1 missiles. The later construction FBM submarines carry the second generation POLARIS, the 1,500 nautical mile range A-2 missile. POLK will carry the new third generation, 2,500 nautical mile A-3 missile.

THE MISSILE

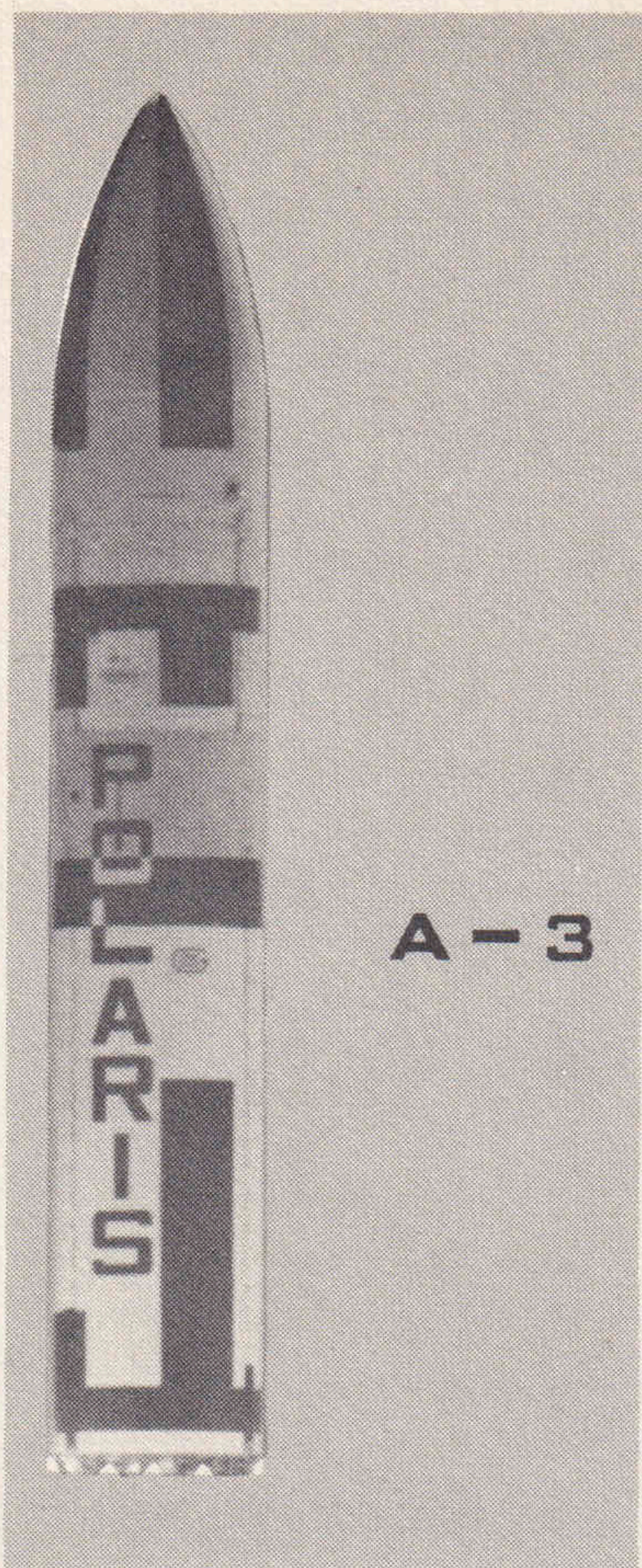
POLARIS, named for the North Star, is a two-stage ballistic missile powered by solid rocket motors.

The 2,500 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 shuts off the rocket motors and triggers separation of the re-entry body from the missile. The re-entry body then follows a ballistic trajectory to the target.

MISSILE AWAY



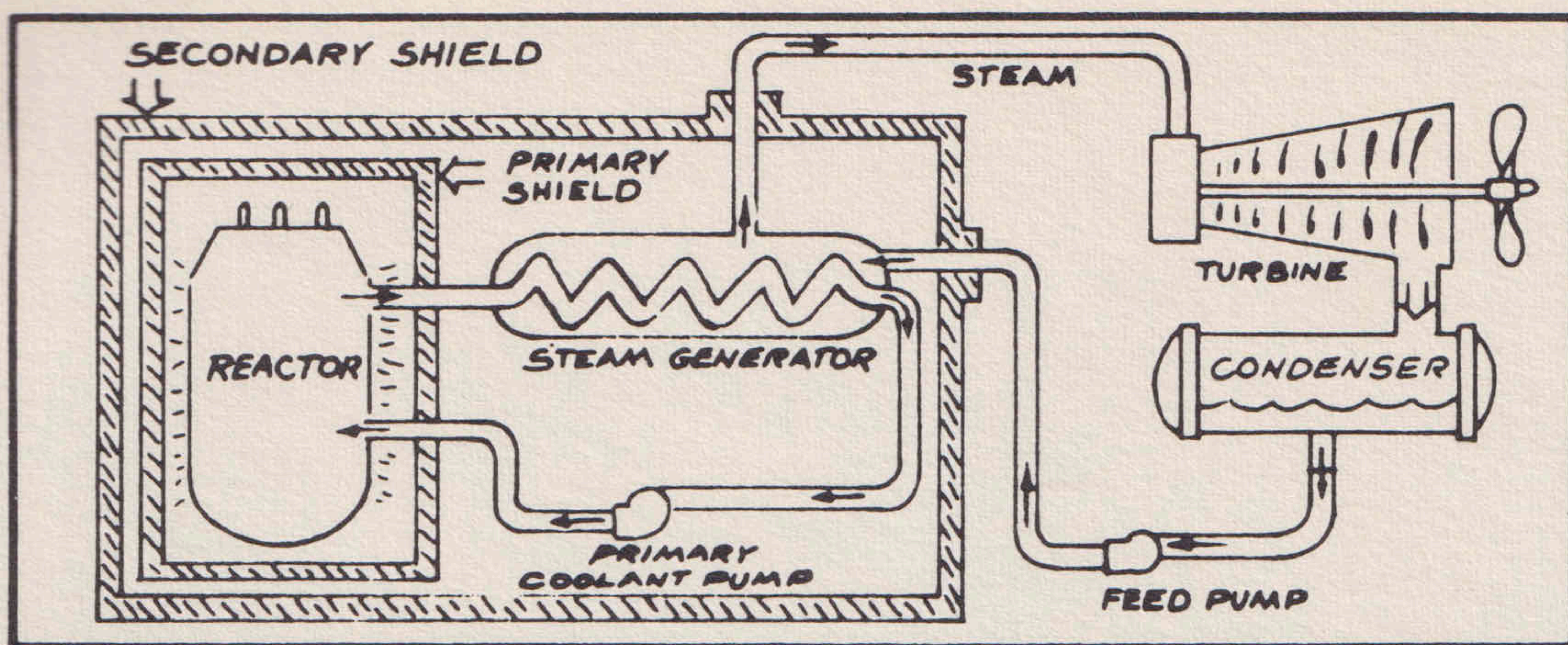
A-3 POLARIS MISSILE

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 command without the need for a long countdown. 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.



THE POWER PLANT

The POLK 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 and the ship's turbo generators 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 completely 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 turbo-generators 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.

VITAL STATISTICS

Keel Laid 23 November 1963

Length 425 Feet

Launched 22 May 1965

Beam 33 Feet

Commissioned 16 April 1966

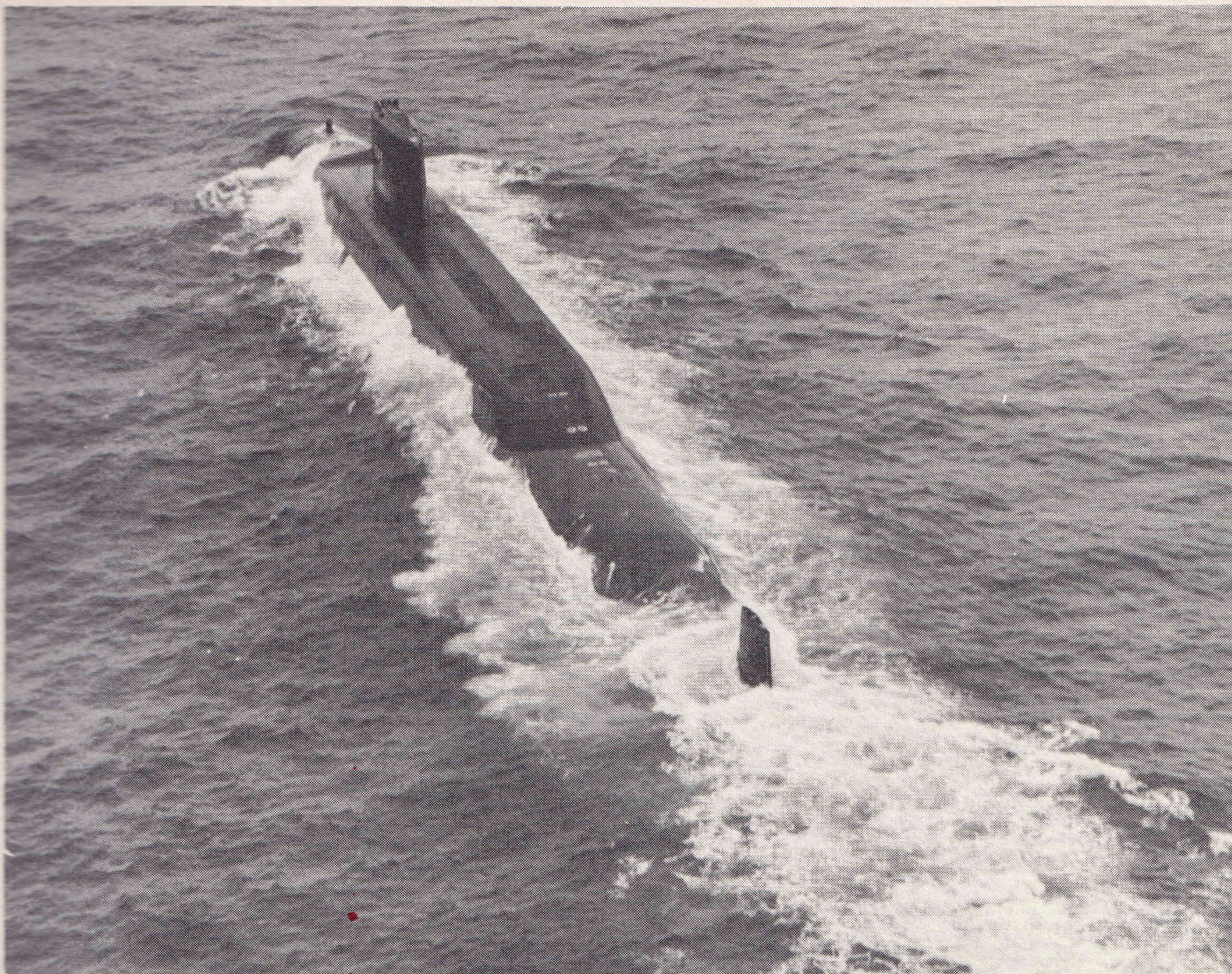
Displacement surfaced about 7000 tons

Displacement submerged about 8200 tons

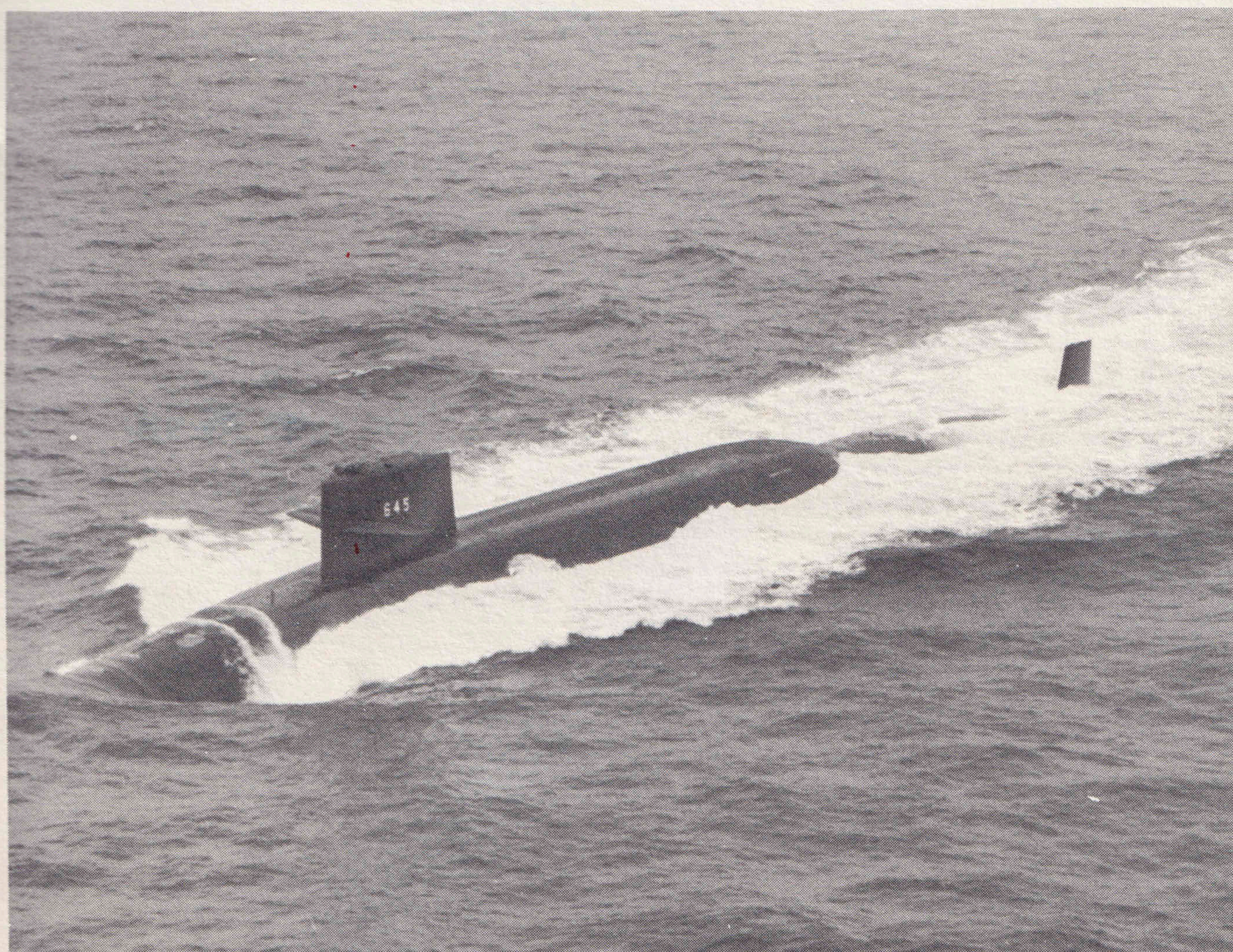
Speed submerged over 20 knots

Diving depth over 400 feet

Built by Electric Boat division of General Dynamics



SEA TRIALS



THE INSIGNE OF USS JAMES K. POLK (SSBN645)

The burst of sun in the western sky and the eagle in flight symbolizes the "Spread Eagle Platform" on which James K. Polk ran for and was elected to the Presidency in 1844. President Polk sought and achieved territorial expansion to the country's natural western borders. This vast area, as we know it now, encompasses nine western states of the Union.

The four stars represent the four major land areas California Territory, New Mexico Territory, Texas Statehood and Oregon Territory, acquired during President Polk's term of office.

The field of blue stands for the unity of purpose that Polk strived so hard for among the several states and territories.

The blue field edged in gold reflects the foundation of a formal course of education and preparation for Naval Officers at the United States Naval Academy founded in 1845.