United States Ship

FRANCIS SCOTT KEY

SSBN-657

WELCOME ABOARD

SHIP'S
VITAL STATISTICS

Length	425 Feet
Beam	33 Feet
Displacement Surfaced	About 7400 Tons
Displacement Submerged	About 8200 Tons
Speed Submerged	Over 20 Knots
Diving Depth	Over 400 Feet
Keel Laid	5 December 1964
Launched	28 April 1966
Commissioned	3 December 1968
Poseidon Conversion	17 May 1973
Trident Conversion	September 1978
Built By	Electric Boat Division of General Dynamics

Like all nuclear powered submarines, KEY is powered by a nuclear reactor capable of generating sufficient steam energy to drive the ship at high speeds through the water and operate all its auxiliary equipments.

The nuclear powered submarine is a marvel of American technology. Its fuel core will last for several years without replenishment, enabling it to maintain sustained operations while completely submerged for months at a time. Oxygen generators and atmosphere control equipment maintain the ship's atmosphere at a state more pure than the air outside. Air conditioning maintains the ship's living and work spaces at a comfortable temperature which also keeps the thousands of electronic parts from overheating. Fresh water is generated in sufficient quantity to meet all the needs of the ship and crew, including showers for all.

A full complement of periscopes, radar and sonar equipment provides the eyes and ears of the submarine. Of course to avoid giving away the ship's position during the time the submarine is on patrol, no outgoing electronic signals of any kind are allowed. Sonars used during operations are of a passive nature which gererate no audible signal.

With all these different equipments fitted inside its hull like the pieces of a three-dimensional jigsaw puzzle, the KEY is a maze of many miles of electrical cable and piping surrounding thousands of transistorized circuits and modules. But amid the hum of the submarine's turbines, gyroscopes, computers and motors and the glow of its many multi-colored lights, KEY's sailors make a home.

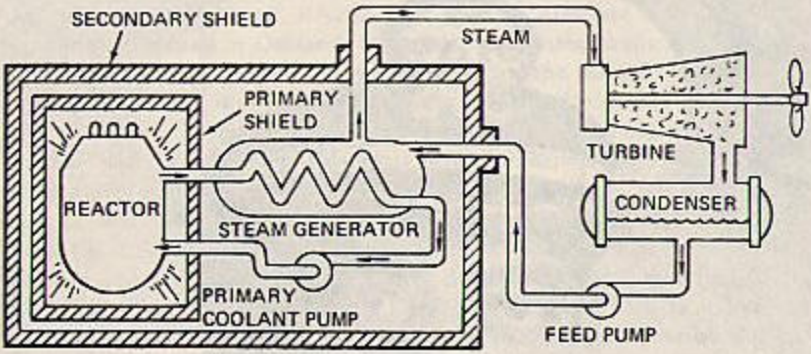
A stainless steel galley outfitted with the most modern cooking equipment answers the need nearest and dearest to the hearts of submariners - - good food. Four planned meals are served each day, and snacks can be had for the asking around the clock.

The two-month patrol is made more endurable for the crew by recreational and relaxation features. A ship's entertainment system features the latest hit tunes. Different movies are shown twice daily on the patrol. A small but well stocked library provides reading variety, from textbooks to thrillers.

Night is simulated when the white of flourescent lights in berthing areas is replaced by a soft red glow. Living and work spaces are tastefully decorated with pleasing colors to add to the submarine's habitability.

While every effort has been made to make their burden of deterrence more bearable, submarine sailors never forget their tremendous responsibility. To a man, they are highly competent in their skills and totally dedicated to their mission of peace. They are a team of experts, drilled and trained to do their exacting work through many months of individual schooling and training.

HOW NUCLEAR POWER OPERATES A SUBMARINE



The power plant of a nuclear submarine is based upon a nuclear reactor which provides heat for the generation of steam. This, in turn, drives 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, loops of piping, primary coolant pumps and steam generators. Heat produced in the reactor by nuclear fission is transferred to the circulating primary coolant water which is pressurized to prevent boiling. This water is then pumped through the steam generator and back into the reactor by the primary coolant pumps for reheating in the next cycle.

In the steam generator, the heat of the pressurized water is transferred to a secondary system to boil water into steam. This secondary system is isolated from the primary system.

From the steam generators, steam flows to the engine room where it drives the 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 independent 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 to enter the reactor compartment. Heavy shielding protects the crew so that the crew member receives less radiation on submerged patrol than he would receive from natural sources ashore.

COMMANDER GREGORY E. BAJUK
UNITED STATES NAVY

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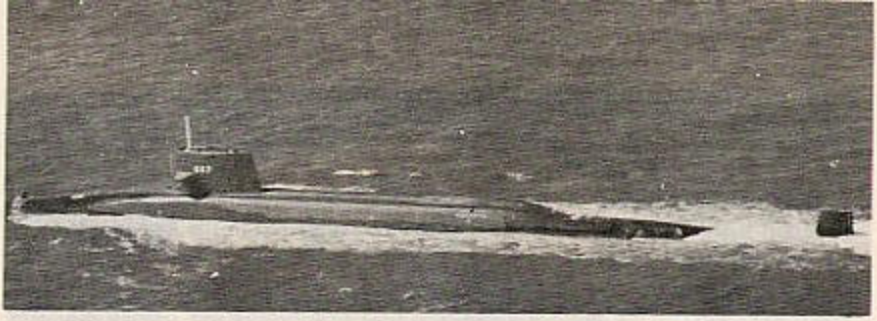
Commander Gregory E. BAJUK was born in Alameda, CA in 1941. He attended high school in Oakland, CA, and then enlisted in the Navy in 1959 in the Nuclear Field program. He was selected for the Navy Enlisted Scientific Education Program, and subsequently attended the University of Idaho from 1961 to 1965. He graduated with a Bachelor of Physics degree and was commissioned via the Officer Candidate School in November 1965.

Following completion of Naval Nuclear Power School, Nuclear Prototype training, and Submarine School, Commander BAJUK reported to USS TRIGGER (SS 564) in Charleston, SC. After a fifteen month tour in which he served in the weapons and engineering departments and qualified in submarines, he reported to USS JAMES K. POLK (SSBN 645) BLUE, homeported in Groton, CT. He served as Chemistry and Radiological Controls Officer as the Main Propulsion Assistant during five Polaris Patrols conducted out of Holy Loch, Scotland. Commander BAJUK served from 1971 to 1975 as Engineer Officer, USS ETHAN ALLEN (SSBN 608) BLUE and GOLD crews and was homeported sucessively in Groton, CT, Bremerton, WA, and Pearl Harbor, HI. In July 1975 he reported to the NROTC Unit, University of Notre Dame for a two year tour as an instructor in Naval Science. From November 1977 to February 1981 he served as Executive Officer, USS SWORDFISH (SSN 579) homeported in Pearl Harbor, HI. He completed three Western Pacific deployments during this period. On 8 December 1981, Commander BAJUK took command of USS FRANCIS SCOTT KEY (SSBN 657) GOLD crew and completed two Trident strategic deterrent patrols.

Commander BAJUK is entitled to wear the Navy Commendation Medal with Gold Star, the Navy Achievement Medal with Gold Star, the Navy Expeditionary Medal, the National Defense Service Medal and the Navy Sea Service Deployment Ribbon.

Commander BAJUK and his wife Marcia reside in Charleston, SC. Commander and Mrs. Bajuk have three children, Brian, Michael, and Christopher.



SHIP'S HISTORY

USS FRANCIS SCOTT KEY (SSBN-657) had her keel laid at the Electric Boat Division of General Dynamics Corporation in Groton, Connecticut on 5 December 1964. She is named in honor of the lawyer, statesman, patriot, Francis Scott Key, who wrote the words of "The Star Spangled Banner" after being inspired by the heroic defense of the city of Baltimore at Fort McHenry in 1814.

Key was launched on 23 April 1966 with Mrs. Marjory Key Thorne and Mrs. William T. Jarvis, granddaughter and great-granddaughter of Francis Scott Key as co-sponsors. The speaker was U.S. Attorney David G. Bress of the District of Columbia who held the same position that Francis Scott Key did from 1833-1841. KEY became an active part of the Submarine Force, U.S. Atlantic Fleet on 3 December 1966.

Upon completion of shakedown training, a successful A3 Polaris test missile firing, post-shakedown availability and weapons load-out, the ship departed on her first POLARIS deterrent patrol from Charleston, South Carolina on 6 June 1967. She was assigned to Commander Submarine Squadron SIXTEEN in Rota, Spain for operational control. During the 18 patrols that followed KEY operated out of both Rota, Spain and Holy Loch, Scotland. She also participated in a 4 and 6 missile operational test of the Polaris A3 missile.

KEY was converted to POSEIDON capability during a shipyard period in Puget Sound Naval Shipyard, Bremerton, Washington, February 1972 to May 1973, after which she conducted 18 POSEIDON patrols operating out of Rota, Spain and Charleston, South Carolina.

In September 1978 following patrol 37, KEY underwent the first backfit conversion to TRIDENT I missile capability. Following this conversion KEY conducted the sea TRIDENT missile test program followed by the qualification of both crews to deploy with TRIDENT. In October 1979 KEY became the first Fleet Ballistic Missile Submarine to deploy with the TRIDENT missile — "First in a New Age of Peace".

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 resloved, 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 creeds and sects. 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."

TRIDENT C-4 MISSILE

Trident I (C-4) is a three stage, solid propellent missile, launched from a submerged FBM submarine. The C-4 was specifically designed to fit into the same missile tubes that held Poseidon. Later versions of the Trident missile will only fit into the larger TRIDENT submarines.

Trident can be fitted with multiple warheads, each of which can be seperately targeted. This capability known as MIRV, or Multiple Independently Targetable Reentry Vehicles helps assure Trident's ability to penetrate any enemy defenses.

Like Poseidon, Trident will act as a deterrent to nuclear aggression by inexorable nuclear retaliation of an unacceptable level to a nuclear aggressive act against the United States. USS FRANCIS SCOTT KEY was the first submarine to receive this capability.

TRIDENT I

Length:	34 Feet
Diameter:	74 Inches
Weight:	72,000 Pounds
Powered Stages:	Three
Motor Case Materials:	Glass Fiber
Nozzles:	One, Each Stage
Propellent:	Solid Double Base
Guidance:	Inertial
Range:	About 4,000 N.M.
Warhead:	Nuclear

Ship's Inertial Navigation System (SINS) maintains constant plot of ship's position for navigation and fire control.

Fire Control computers receive information on ship's location and true north (from SINS), target locations, and other information, and compute on a continuous basis trajectory information for rapid transmission to missile "memory."

Missile test and readiness equipment (MTRE) provides complete readiness checkout of all missiles and associated equipments.

Launcher control prepares the 16 missile tubes for launch, including pressurization to insure that when the muzzle hatch is opened, the tube remains free of water until the missile is launched.

Missile guidance "memory" receives and stores trajectory data from the fire control system.

Missile Control panel reflects status of all missiles. Sequence of missiles to be fired is selected here and final launching circuit is closed here after Captain has given permission to fire.

Once all events have taken place to enable to launch, closing firing key causes gas generator to ignite, whose exhaust forces missile out of tube.

Only after it is safely out of the launch tube does missile ignite, to protect crew and ship. Once launched, the inertial guidance system in the missile directs the remainder of flight free of outside control.

THE OFFICIAL 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 home of the brave!" In the foreground is a silhouette of the USS FRANCIS SCOTT KEY, one of the Navy's Fleet Ballistic Missile Submarines which comprises this Nation's number one contribution toward world peace.