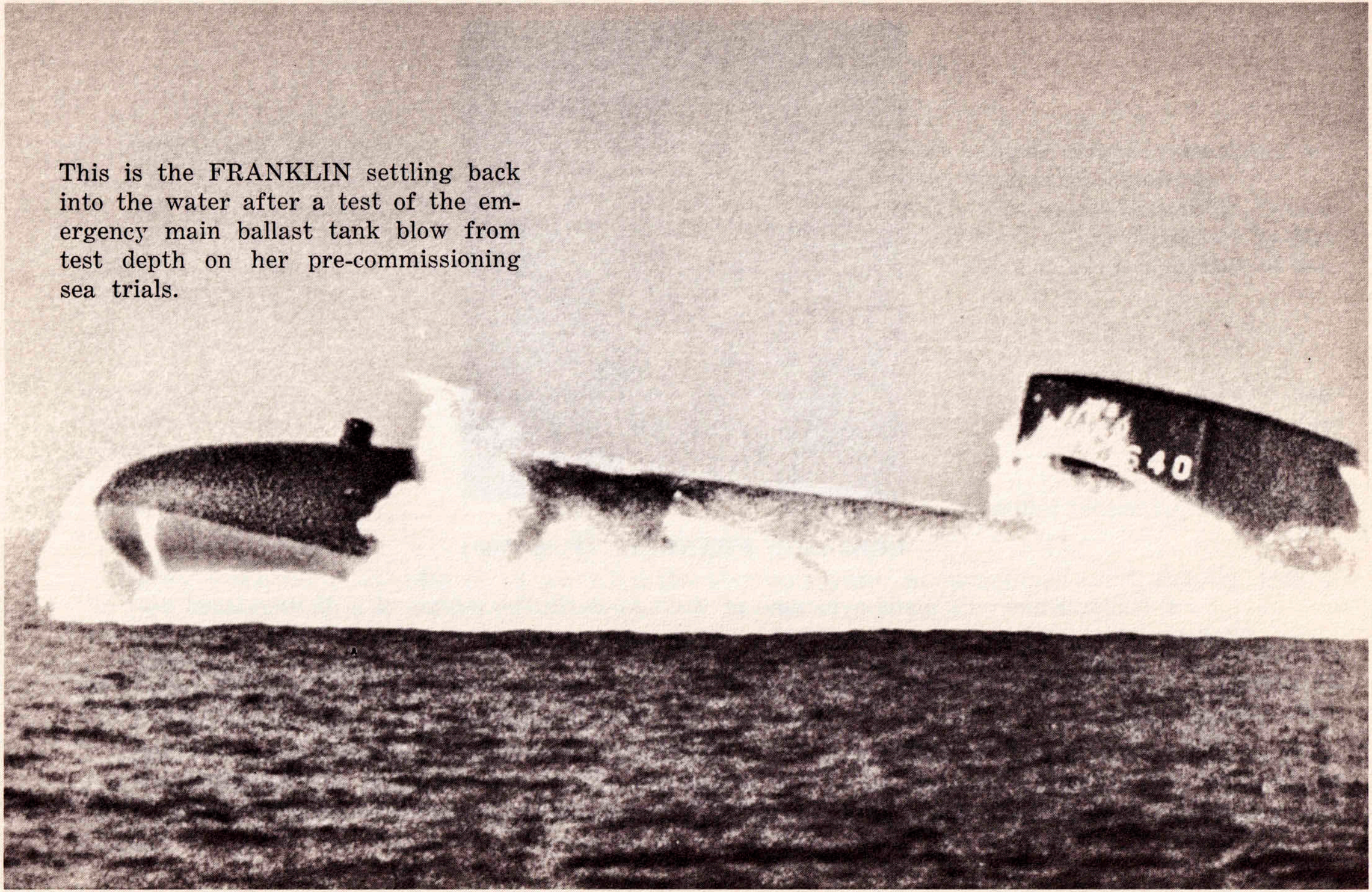
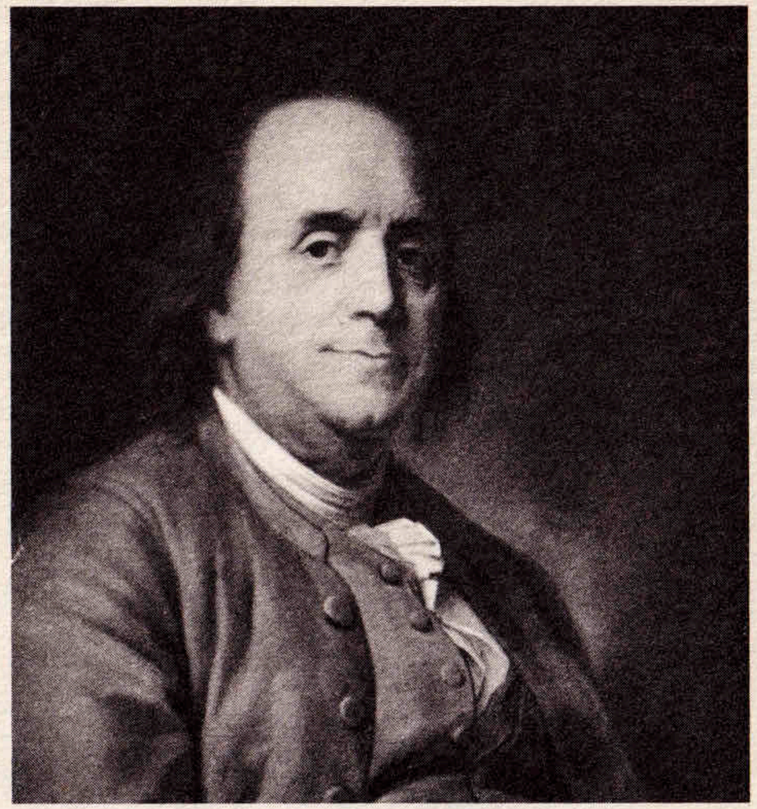
Welcome Aboard

USS BENJAMIN FRANKLIN
(SSBN 640)

This is the FRANKLIN settling back into the water after a test of the emergency main ballast tank blow from test depth on her pre-commissioning sea trials.





BENJAMIN FRANKLIN (1706-1790)

A businessman who made a fortune at the age of 42, the author of a distinguished autobiography, a scientist who discovered positive and negative electricity, the inventor of bifocals, a diplomat who won vital aid from France for the struggling colonies during the American Revolution—Benjamin Franklin was the Renaissance Man of 18th century America. Like the ballistic missile submarine which proudly bears his name, he implemented America's policies in his day. He was the only American to sign the four documents which established the United States as an independent nation—The Declaration of Independence, the alliance with France, the peace treaty with England, and the Constitution. He often worked seven days a week in his trade, as does his namesake.

USS BENJAMIN FRANKLIN (SSBN 640)
Ship's History

BENJAMIN FRANKLIN is the first of the SSBN 640 class of fleet ballistic missile submarines and the sixth ship of the line to bear the name of the famous American inventor, author and statesman.

The keel was laid on 25 May 1963 at the Electric Boat Division, General Dynamics Corporation, Groton, Connecticut. On 5 December 1964 BENJAMIN FRANKLIN was launched, having been christened by Mrs. Francis L. MOSELEY and Mrs. Leon V. CHAPLIN, great, great, great, great, great-grandaughters of Benjamin Franklin.

VITAL STATISTICS

Keel Laid:	25 May 1963	Displacement submerged:	8200+ tons
Launched:	5 December 1964	Displacement surfaced:	7000+ tons
Commissioned:	22 October 1965	Speed submerged:	Over 20 knots
Poseidon Conversion:	12 May 1972	Diving depth:	Over 400 feet
Length:	425 feet	Builders:	General Dynamics/Electric Boat
Beam:	33 feet		

After successful completion of all sea trials the ship was placed in commission on 22 October 1965 at the U. S. Naval Underwater Sound Laboratory New London, Connecticut.

Shakedown cruise commenced on 26 October 1965. On 6 December 1965 the Gold Crew successfully launched a Polaris A-3 missile in close coordination with an orbital pass of the GEMINI 7 astronauts, BORMAN and LOVELL. The Blue Crew successfully launched a Polaris A-3 missile on 20 December 1965.

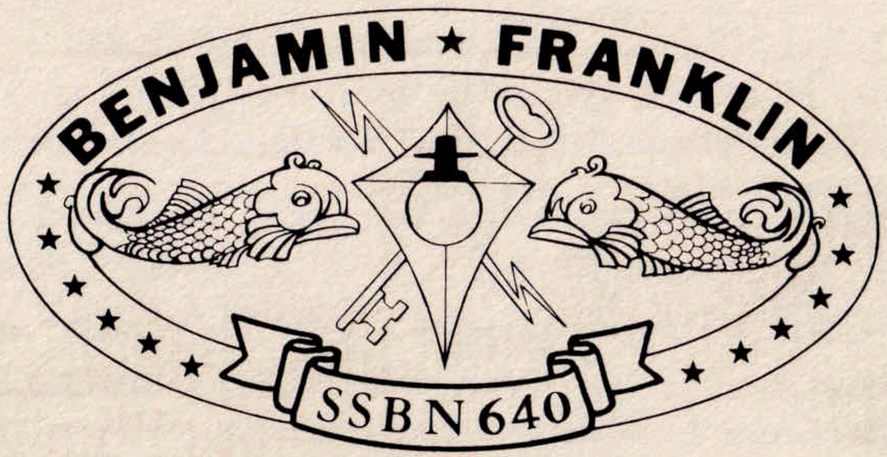
Upon completion of shakedown cruise on 25 January 1966, BENJAMIN FRANKLIN moored at Newport News Shipbuilding and Dry Dock Company, Newport News, Virginia. On 5 March 1966 BENJAMIN FRANKLIN was again ready for sea and enroute to Charleston, South Carolina for tactical loadout and ultimate deployment to the Pacific Fleet.

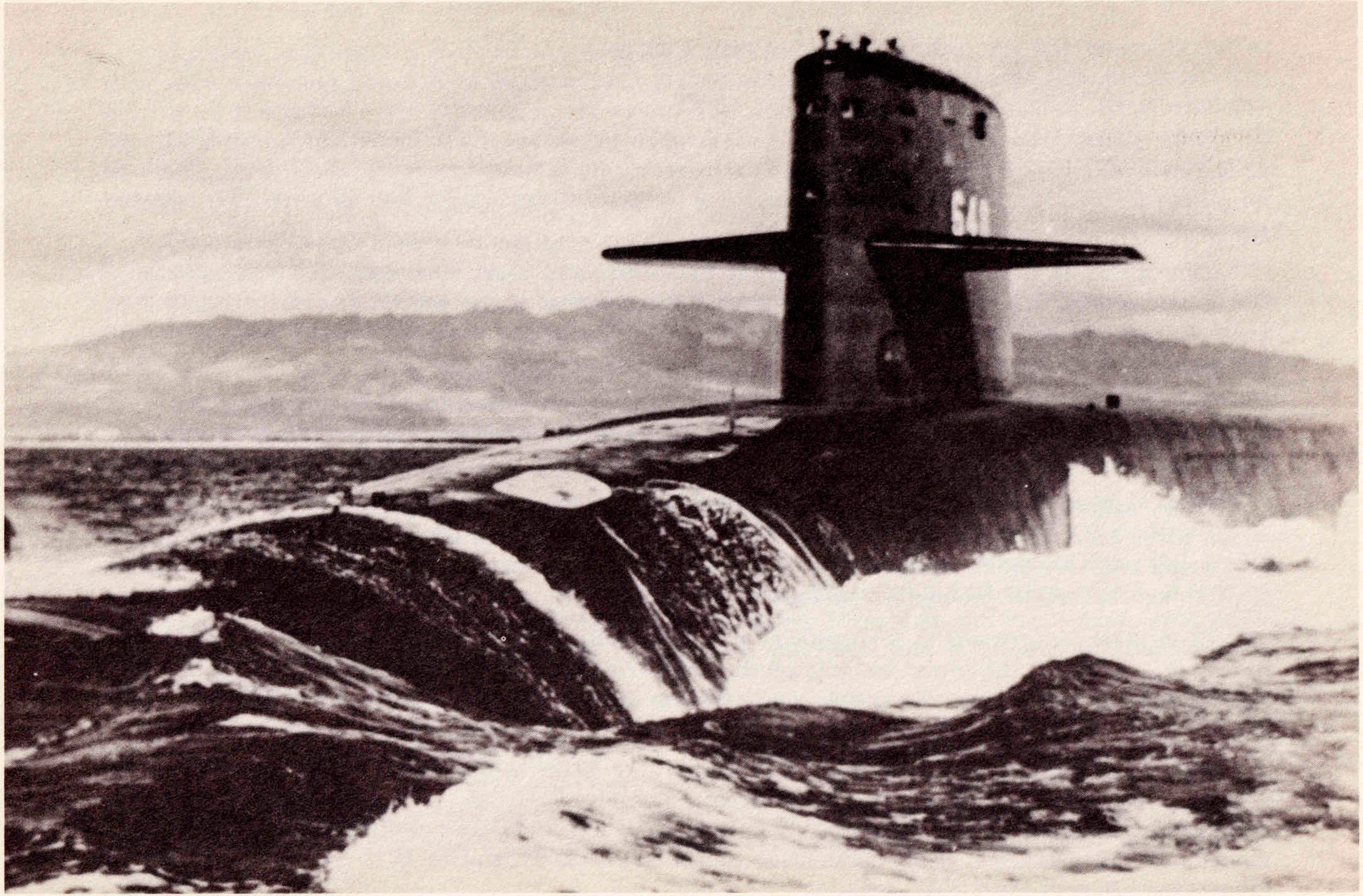
Following the tactical loadout, BENJAMIN FRANKLIN transited the Panama Canal, chopped to CINCPACFLT on 4 April 1966 and arrived at Pearl Harbor on 20 April 1966.

After a brief refresher training period in Pearl Harbor, the Blue Crew deployed with the ship on 6 May 1966 on its first Polaris deterrent patrol which was successfully completed on 11 July 1966 when BENJAMIN FRANKLIN arrived in Apra Harbor, Guam.

On 27 February 1969, both crews were awarded the Meritorious Unit Commendation, in recognition of the achievement of both crews in sustaining an exceptionally high state of readiness from the period of commissioning to September 1968.

On 28 August 1970 the Blue Crew departed Apra Harbor, Guam, M.I. for the BENJAMIN FRANKLIN's nineteenth Polaris patrol and transit to New London, Connecticut. This was the final patrol prior to entry into the shipyard at Electric Boat Company, General Dynamics Corporation, Groton, Connecticut for Poseidon Conversion. The conversion was completed in May 1972 and the FRANKLIN once again took her place in the deterrent force.





THE CREW

With all its awesome complexity and high degree of automation, FRANKLIN is only as good as the men who breathe life into her. On patrol, the ship is literally a world unto itself. There is no calling for outside help to come fix something or ask how it is supposed to work. The submarine must be—and is—self-sufficient.

The operation of the submarine and its nuclear power plant, the operation and upkeep of the Poseidon missile system, indeed, the entire effectiveness of the system as a deterrent to war, is up to the 140 enlisted men and officers. And effectiveness is directly related to the amount and quality of training a crew receives.

Training of an FBM (Fleet Ballistic Missile) submariner falls into two broad categories. One is training required before assignment and the other is the practical training received while on patrol and ashore between patrols.

Every sailor goes through nine weeks of time-honored boot camp right after joining the Navy, which gives him an introduction to the Navy and the Navy way of life. All potential submariners also spend eight weeks in submarine school learning the rudiments of submarine life, including such things as escape techniques in case of emergency.

Even after assignment to a submarine a man is still not a full-fledged submariner. Before he pins on his dolphins, the proud insignia of the submarine service, he spends about 36 weeks earning the right to wear them. He spends hours tracing out piping, wiring, and all the systems which are vital not just to the operation of the submarine but to its very safety.

Almost all FBM sailors attend a basic school and many additionally attend more advanced schools where they specialize in particular fields. Basic, or class "A", technical school is in one of the technical ratings. All of these schools include basic electricity and electronics as well as fundamentals in the particular field. Submarine School at Naval Submarine Base New London, Groton, Connecticut follows class "A" training.

The next step sends a man to advanced Poseidon specialty training, nuclear power training, or aboard a nuclear powered or conventional attack submarine for submarine qualifications. The goal of all the schools is to have the technician fully ready to handle his assigned responsibilities the day he sets foot in the FBM submarine. Stress is put on teaching total system operation and how each unit fits into and contributes to the whole. When he has completed his training, a man becomes a member of an FBM submarine crew.

After a man has mastered his own particular speciality, he then starts on the road to becoming a supervisor and must learn the operations of the entire system much as a systems engineer does. At this point the circle becomes complete and he is responsible for instructing new men who are following the same path he took.

FBM submariners are operating and maintaining systems using the most advanced technology of the day. Their training is necessarily equally advanced. The highly capable Poseidon submariners and their awesome submarine combine to give our nation its mightiest deterrent to nuclear war.

Life for a FRANKLIN submariner, if not unique, is certainly different from that of others. While others measure time in hours and days, an FBM sailor counts his in months. Months on patrol, months at home, months in training. Each FBM submarine is assigned two full crews. Called "Blue" and "Gold", each has its own Commanding Officer and full complement of officers and men. While one crew has the ship on patrol, the other is back in the home port, undergoing refresher training, taking leave, breaking in new crew members, and in general getting ready to go back to sea.

On patrol the ship settles into the routine which will be followed for the entire cruise. For the missilemen and nuclear power technicians, the sonarmen and radiomen, this means shifts of six hours on watch and six hours for rest, recreation, and training. Ship's routine is up to the Captain; in some cases watches are stood on a four on, eight off basis. The yeomen, hospital corpsman, cooks, stewards and some others may work normal ten to twelve hour days or split their work to cover periods required.

All the crew knows about the voyage is that they will be gone for 60 or more days and that they will be submerged the entire time. Where they are going, what route they will take to get there, just when they will return, only the Commanding Officer knows. But the whole crew is aware that the only reason for being on patrol is to be ready to launch their awesome cargo of 16 Poseidon missiles, if and when the President so orders.

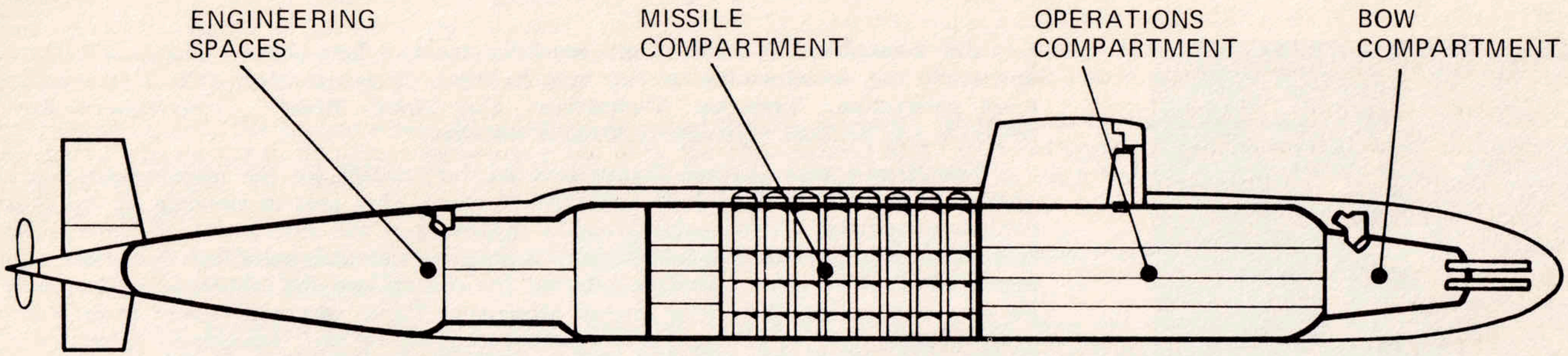
Naturally, all is not work on board the submarine during the patrol. Like all submarines, although FRANKLIN is bigger and roomier than non-FBM types, bunks for the crew are scattered throughout the ship, as well as in the comparatively spacious crew's quarters. Only the Captain and the Executive Officer have their own staterooms. The other officers triple up in well-designed but compact staterooms. The ship is decorated throughout in light pastel colors to provide a pleasing atmosphere for the long haul.

The crew's dining hall is large by submarine standards. It serves the additional purposes of movie theater, recreation hall, study area, and country store cracker barrel. Off hours are more than filled with recreational facilities including a first-run movie every night, music from a great variety of tapes, and a well stocked library.

In addition, all FBM sailors have the opportunity to take college level courses for self-improvement and college credit while on patrol.

Family men, of course, spend as much time as they can with their wives and children. One of the advantages of FBM life is that the men know exactly what their schedule will be for the next year or so and can plan ahead with reasonable certainty.

The men of BENJAMIN FRANKLIN take time out from their unique and busy way of life to wish you "WELCOME ABOARD".



THE DEPARTMENTS

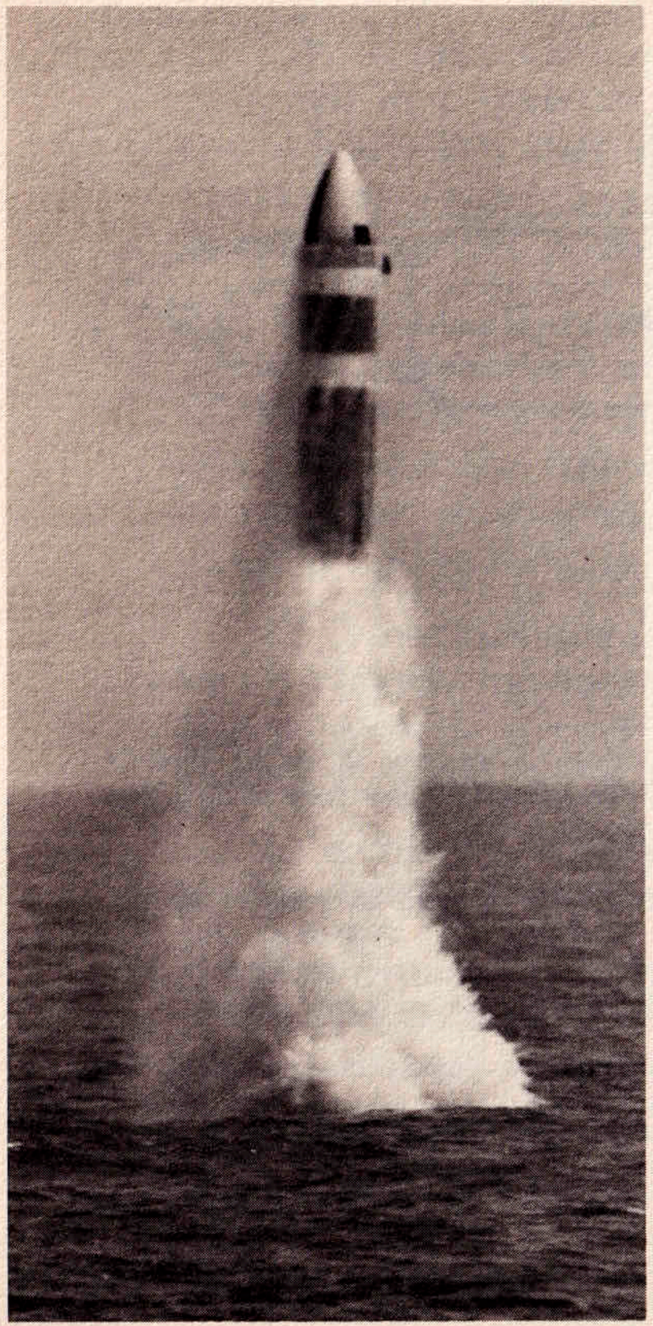
WEAPONS DEPARTMENT

The Weapons Department aboard USS BENJAMIN FRANKLIN is divided into six distinct divisions; Missile, Missile Fire Control, Launcher, Torpedo, Torpedo Fire Control and Deck. The personnel in each of these divisions are responsible for insuring that the Weapons System is maintained in a condition of maximum readiness at all times.

SSBN640's Weapons System consists of the MK88 Mod 1 Missile Fire Control System which prepares deployment of the sixteen Poseidon Missiles; the MK 24 Mod 0 Launcher System which houses, supports and launches the missiles; the MK 113 Mod 9 Torpedo Fire Control System which provides torpedo fire control solutions and input parameter settings to the torpedoes; and the MK 65 Mod 3 and 4 Torpedo Tubes which support and launch the various torpedoes carried aboard.

The Weapons and their associated support equipment reflect the advanced state of technology which has allowed the United States to land men on the moon. The application of multi-purpose high speed digital electronic computers throughout the weapons system requires highly trained, highly intelligent personnel to maintain and operate this complex system.

The Missile Technicians are responsible for maintaining the Poseidon Missiles and making it ready for launch. This requires a detailed knowledge of the construction and function of the many and varied subsystem equipment and components. These men are also required to have a detailed knowledge of the launcher system and Missile Compartment systems as they stand Missile Compartment Roving Security Watches and watches Operations Supervisors.



The Launcher Technicians are specially trained Torpedomen responsible for the operation and maintenance of the launch tubes, launch control subsystems and the eject subsystem. Launcher Technicians also stand Missile Compartment Roving Security and Launch Operations Station watches.

The Missile Fire Control Technicians are responsible for the maintenance and operation of the MK 88 Mod 1 Fire Control System. This system consists of the central control computers, which enable pinpoint targeting of the missiles at all times, missile test and readiness equipment, numerous timing devices and switching and relay equipment; all of which allow interface between fire control and the missile as well as directing and monitoring the entire launch sequence. These personnel stand their watches in the Missile Control Center where the vast majority of their equipment is located.

The Torpedo Division is manned by Torpedomen who, although they are Launcher trained, stand their watches in the Torpedo Room. These personnel are required to have a detailed knowledge of the torpedo tubes and the various torpedo types carried on board BENJAMIN FRANKLIN.

The Torpedo Fire Control Technicians operate and maintain the MK 113 Mod 9 Underwater Fire Control System and support equipment associated with the ship's approach and attack capabilities. The electronic complexity of these equipments require the highest degree of training and skill.

The only non-technical division in the Weapons Department is the Deck Division which is composed of non-rated personnel who are responsible for maintaining the topside portion of the ship. They are charged with the maintenance of the material integrity of the ships structure as well as painting and preservation of the ships exterior.

The weapons Department is the largest Department on board BENJAMIN FRANKLIN. Each and every member is dedicated to the task of keeping the ship and the awesome deterrent weapons systems in a state of maximum readiness at all times.

THE OPERATIONS AND NAVIGATION DEPARTMENTS.

The Operations and Navigation Departments, although having distinct and different purposes, are under the direct supervision of one officer. An assistant is assigned to the NAV/OPS Officer to aid in carrying out the many and varied tasks assigned to these two departments.

The Navigation Department is responsible for insuring that the ship's position, attitudes (pitch, roll and heading), and velocities are known to an accuracy necessary to meet the stringent requirements of the Poseidon Weapons system. This is done by using a ship's inertial navigation system (SINS). By using this highly accurate and completely independent navigation system, missile firing parameters are maintained 24 hours per day for the entire deterrent patrol.

In addition to the unique mode of navigation required for the Weapons System, the Navigation Department is also charged with the responsibility of safely navigating the ship through coastal and restricted waters when proceeding to and from advanced refit sites. This form of navigation is performed vice conventional means such as radar and piloting using the ship's two periscopes.

The Operations Department because of its three-fold purpose is divided in three separate divisions: Sonar, Communications, and Electronic Material.

The Sonar Division, with its long range listening equipment, serves as the eyes and ears of the submarine while submerged. Using the piezoelectric principle, sound pressure waves are converted to electronic signals, thereby allowing trained technicians to differentiate between the familiar whistle of a friendly dolphin or the churning screws of 1000 foot supertankers.

The Communications Center is charged with the responsibility of remaining in constant communication throughout the deterrent patrol. Should a launch message ever be sent, the ship must be ready to respond at all times. In addition to this primary purpose, the Communication Center also processes family-grams (a 15 word personal message to each crew member from friends or family) and wire news service, thus keeping the crew's morale high and keeping them informed of the latest news from back home.

The Electronics Material Division operates and maintains the radar and electronic countermeasure equipment. Because FBM's are always to remain undetected, the electronic countermeasure equipment is used to detect unfriendly radar.

The ship's radar is used for navigation in coastal waters and during surface transits.

To carry out all these functions, the Navigation and Operations Departments employ the services of ten electronic technicians, seven sonarmen, six radiomen and five quartermasters. Their total training and experience represent approximately 18 years of formal school training and 80 years of at sea experience.

THE POWER PLANT

BENJAMIN FRANKLIN 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, 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.

Since BENJAMIN FRANKLIN spends much of its operational time submerged it becomes necessary to manufacture all the air and water necessary to sustain the crew during these periods. For this purpose, various equipment is provided to produce oxygen, to remove carbon monoxide, carbon dioxide and hydrogen from the atmosphere and to distill water.

Much of the ship's equipment, including steering and diving, masts, and most hull sea water valves, are operated by high pressure hydraulics. Accumulators are used to store high pressure oil and pumps maintain the oil level in the accumulators.

Many ship's systems also use air at various pressures. High pressure air is stored in air banks located in the Main Ballast Tanks external to the pressure hull. Air compressors take a suction on the ship's atmosphere and discharge this air at high pressure into the air banks.

With the large amount of electronic equipment on board and the steam piping in the engineering spaces, the problem of air conditioning becomes very critical for both habitability and equipment reliability. Chilled water is provided to spot coolers in ventilation lines and also directly to some equipment to maintain desired temperatures throughout the ship. This water is cooled in either of the two types of air conditioning units on board. Refrigeration is also provided for stowage of food.

In addition to the power plant and auxiliary machinery, the Engineering Department is also responsible for maintaining all of the electrical gear from light bulbs to turbine generators, and all structural components. In short the Department is responsible for providing a suitable environment and a suitable vehicle for all the sophisticated equipment and personnel on board.

SUPPLY DEPARTMENT

The FBM Supply Department handles logistics and support functions common to all ships. However, FBM Supply personnel must accomplish these functions despite limited space and approximately one-third the number of men assigned to Supply aboard a surface ship such as a destroyer.

The Food Servicemen order, receive, inspect and stow provisions, plan menus, prepare and serve meals and baked goods, make monthly and quarterly reports, and supervise the cleanliness and sanitation of the pantry, galley, wardroom, and

crew's dinette. The Food Servicemen must uphold the reputation of the Submarine Force for outstanding meals as there is little else to brighten the routine day of a long patrol.

The FBM Storekeeper's position is one of ever-increasing responsibility and complexity. Special weapons, navigation, and power plant systems require close supervision of the related allowance lists, spare parts and assembliees. In general, the storekeepers requisition, receive, stow, and issue the 25,000 different types of spare parts required for the maintenance of shipboard equipment. They also are responsible for filing, conducting inventories, managing operating funds and preparing and submitting reports. The two storekeepers are assisted by one man from each division designated the Divisions Repair Parts Petty Officers (RPPO's). Without these men the storekeepers workload would be excessive.

The Supply Department has a large job to do with a small complement of men, and it is to their credit that the ship operates as efficiently as it does.

MEDICAL DEPARTMENT

The Medical Department is responsible for maintaining the crew in optimum physical and mental readiness for their work. This involves performing routine physical examinations, conducting daily sanitation inspections, supervising the quality of drinking water and food, and monitoring the dosage of radiation received by each man, ensuring that it is below the limits prescribed by the Bureau of Medicine and Surgery.

In keeping with the ship's primary mission as a deterrent force, the Medical Department is prepared at all times to cope with any medical emergency. The Department is supplied as well as many small hospitals. All the necessary medications and supplies are available to manage anything from simple headaches to major surgery.

FBM's are unique among ships of the Silent Service in that there is a Medical Officer assigned to each ship. His role is to be prepared to manage the Medical problems which might arise and which might otherwise cause the ship to break radio silence and compromise the undetected status of the deterrent patrols.

The Medical Officer is assisted by a Hospital Corpsman who is among the most senior and most well trained of all corpsmen. Many of these corpsmen go on to special training as Physician's Assistants after their military service. The corpsman is responsible for the administrative duties of the department, and he also stands regular watches on the ship, usually as Chief of the Watch.

The Medical Department is an important factor in the morale of the crew.

Whether you are a visitor on board or a Submarine School student, as you read about the men of BENJAMIN FRANKLIN we hope that you will be impressed with our men and our equipment, but even more so, we hope that the complexity and great importance of our mission will impress upon you as it does us, the fact that if we ever have to fire our missiles, we will have failed in our job.

We salute you and wish you a hearty

WELCOME ABOARD....

The insigne of the USS Benjamin Franklin symbolizes her role as a major deterrent weapons system while recalling a significant event in the life of her namesake. The Kite, Key, and Lightning represent Franklin's fascination with the phenomenon of electricity and the powerful deterrent force of Poseidon, which is the key to security.