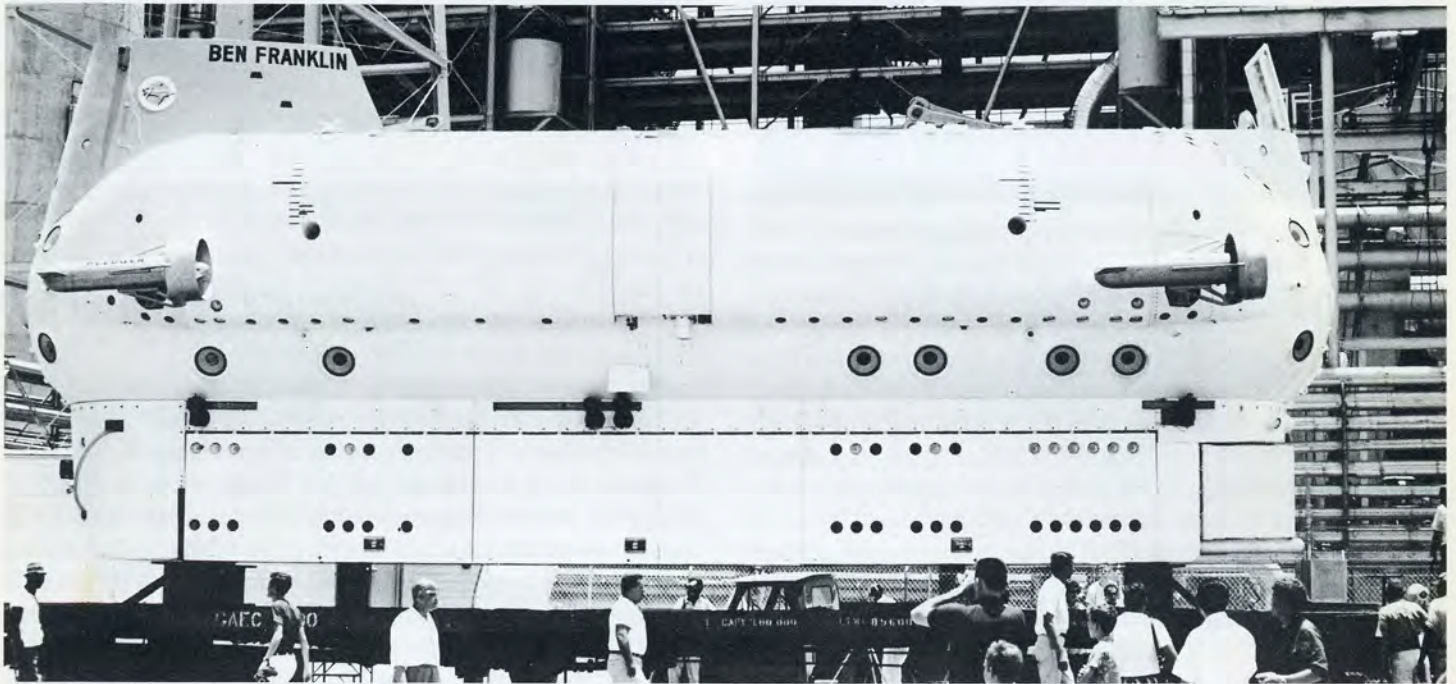


BETHPAGE, NEW YORK

OCTOBER, 1968

BEN FRANKLIN Christened at Florida Ceremonies



DEBUT — Appearing publicly for the first time as a fully-assembled submarine, the Ben Franklin rolls out of the Grumman Port of Palm Beach facility the day before launching on July 26. The vehicle, 50-feet long

and approximately 130 tons, is the newest and largest research submarine in the world. A series of dockside tests will precede seatrials and operational test dives.

Grumman Completes Design of Pipeline Inspection Vehicle

Grumman has disclosed the basic design of a new submersible intended to meet pipeline inspection requirements.

The underwater vehicle can accommodate a three-man crew, working in depths to 500 feet for up to eight hours. Propulsion will be provided by a 15-horsepower DC motor and two three-horsepower ducted thrusters to control pitch and yaw. The ring-stiffened cylindrical hull, to be fabricated of welded steel, measures approximately five and one-half feet in diameter, and 11½ feet in length. Overall length of the 10-ton vessel is 19 feet. Maximum speed is 5 knots.

Ocean Systems director Walter H. Scott, emphasized, however, that the pipeline inspection vehicle is a "point design," intended to meet the requirements of a specific user. Modifications of the present design can readily be made to improve or reduce the vehicle's performance.

(Photo on Page 2)

Government, Naval, and Corporate Representatives Hail Vessel

Franklin Kin Gives Name

The research submersible Ben Franklin was formally christened and introduced to the world at ceremonies held at Grumman's Ocean Systems facility in Riviera Beach, Florida, on August 21.

Principals in the hour-long dockside program included Congressman Paul G. Rogers; Rear Admiral O. D. Waters, Oceanographer of the Navy; Grumman board chairman and chief executive officer, E. Clinton Towl, Dr. Jacques Piccard, and J. B. Rettaliata, Vice President for Public Relations at Grumman.

Sponsor of the submarine was Miss Louisa J. Castle, of Wilmington, Delaware, great-great-great-great granddaughter of Benjamin Franklin: Her sister, Mrs. Ann Molin

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New Vehicle Design

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GRUMMAN PIPELINE INSPECTION SUBMERSIBLE

Submersible Placed in Water on July 26

The time was 11:55 A.M. The place was the Port of Palm Beach, Fla. The day was July 26, 1968, and the event was the launching of the newest and largest submersible in the growing fleet of underwater research vehicles.

The Grumman-Piccard PX-15 (as it was called at that time) rolled out of the Ocean Systems Department facility the day before, riding the flatbed railroad car on which it had rested since arriving from Switzerland in early May.

Two giant cranes gingerly lowered the 50-foot submarine to the dockside, where it was weighed.

Observing the nautical tradition that no boat enter the water without a proper christening, a brief unofficial ceremony was held. Mrs. Frances Scott, wife of Grumman Ocean Systems director Walter Scott, smashed a bottle of champagne across the bow and the vehicle was slowly lowered into the water for the first time.



IN THE SWIM — About to be placed in the water for the first time, the Ben Franklin is gently hoisted over the side at Grumman's Florida facility. America's newest research submarine was launched on July 26.

Scientific Equipment being readied for Gulf Stream Drift

Announcement by Rear Admiral O. D. Waters, Oceanographer of the Navy, and Capt. T. K. Treadwell, commander of the Naval Oceanographic Office, that the latter agency would cooperate with Grumman and participate in the Gulf Stream Drift Mission has been followed by a partial listing of underwater survey and data-gathering equipment soon due to be installed on the Ben Franklin. The instrument package and its general function in the mission profile embraces:

WATER SENSING POD — The vital, baseline data concerning water temperature, salinity, depth and pressure, will be obtained in digital format and stored continuously on magnetic tape using the water sensing pod developed for NAV-OCEANO by Woods Hole Oceanographic Institute. Temperature ranges from -2° to 35°C ; salinity to 30-40 parts in 1000; sound velocity to 1400-1600 m/second; and depths from 0-6100 m, are features of the equipment.

CAMERAS — There will be a pair of 35mm still cameras for stereo photography of the ocean floor mounted on the submersible's keel. Electrically actuated and synched to strobe lights, the cameras can record 3,300 stereo pairs of photos during the month-long underwater mission. Dual 70mm still cameras, mounted on a pan and tilt mechanism on the forward keel superstructure, will be linked to a closed circuit television system, permitting observers to snap spontaneous photos of marine life. The larger cameras have a capacity for 450 pairs of photographs. Color film will be used in the 70mm cameras, with black and white in the 35mm pair. An additional pair of 70mm cameras in a stereo array are under consideration, and there will be several hand-held and wall mounted cameras inside the vehicle.

SIDE SCAN SONAR — An acoustic map of the sea-floor will be possible through the use of a side scan sonar, employing two 110 Kh transducers. The proposed system has ranges of 250, 500 and 1,000 feet, and emits a narrow beam with 70-degrees of elevation and 3-degrees of azimuth. The profile is plotted on a strip recorder. An acoustic sub-bottom profiling system is also under consideration.

CTFM SONAR — A continuous transmission FM sonar is also being installed to observe and monitor the Deep Scattering Layer. The principal function of this system is in obstacle avoidance.

GRAVITY SENSOR — Mounted within the pressure hull, the gravity system will perform continuous measurements of gravity, recording the data on magnetic tape. The equipment ranges up to 27,000 milligals, accurate to 1-2 milligals.

MAGNETOMETER — Attached to a boom extended from the aft end of the vehicle, the proton magnetometer will periodically measure the earth's magnetic field and local anomalies. The data will be recorded on a strip chart, reliable in the



"I CHRISTEN THE . . ." — With a well-aimed blow, Miss Louisa J. Castle, of Wilmington, Del., a direct descendant of Benjamin Franklin, smashed a bottle of water from the seven seas across the bow of the Grumman submersible, thus imparting the name Ben Franklin to the research vehicle. Donald J. Kazimir, skipper of the submarine, observes the momentous blow.

Christening Ceremony

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of Arlington, Va., acted as Matron of Honor for the occasion. Other participants included Admiral Scott Goodfellow, Assistant Oceanographer of the Navy; Donald J. Kazimir, Grumman skipper of the Ben Franklin; director of Ocean Systems for Grumman, Walter H. Scott, Jr., and municipal, state and national officials. The ceremonies were attended by more than 450 guests and members of the press.

In his welcoming remarks, Mr. Towl noted that the Ben Franklin represents Grumman's "first major step toward inner space . . . a frontier which holds the same degree of challenge and ultimate reward held in the reaches of outer space. The success of man's future on earth," he declared, "will depend largely upon what is done to utilize the wealth of our oceans."

Congressman Rogers, who is a member of the subcommittee of the House Marine and Fisheries Committee on oceanography, reviewed the historical importance of the Gulf Stream and noted that "this country has yet to turn its full scientific resources to the seas in any measure like we have to the exploration and exploitation of outer space." He pointed out the irony of this situation by calling attention to the vast stockpile of wealth beneath the seas. Congressman Rogers, a sponsor of the Sea Grant program, praised Grumman for its initiative in pioneering the new frontier of oceanographic research. "While some may be con-



ROGERS . . . A reflection of pioneering spirit. Grumman has chosen to lead.



TOWL . . . The first tangible result of our new oceanography capability.

tent to wait for others to lead the way, to mark the path and take the chances, Grumman has chosen to lead," the Florida legislator observed.

In his remarks, Admiral Waters developed the same theme, praising the initiative which Grumman has shown in developing and funding the Ben Franklin program. He termed the Gulf Stream Drift Mission "an adventure in the great tradition of sea-faring" and pledged the support of the U. S. Navy in providing a surface support ship, technical equipment and experienced oceanographers who will make the historic underwater journey.

Dr. Piccard elaborated, on the wealth of useful scientific information locked in the waters of the Gulf Stream. He sketched the scientific program for the Mission in a general way and concluded by presenting a solid gold key, purported to control the operation of the Ben Franklin, to Mr. Towl. "Now you may take the boat out for a dive whenever you wish," the tall, Swiss engineer informed the Grumman board chairman.

In another presentation, Albert D. Hollingsworth of the Franklin Institute in Philadelphia, turned over to Piccard and Kazimir an engraved replica of the early Franklin chart of the Gulf Stream. The map will be permanently mounted in the submarine.

Miss Castle was presented with an engraved silver bowl as a memento of her part in the christening ceremonies.

Among the many congratulatory messages was a lengthy telegram from Vice President Hubert H. Humphrey, expressing his praise and interest in the program as Chairman of the National Council on Marine Resources and Engineering Development.



WATERS . . . An adventure in the great tradition of seafaring. We are happy to cooperate.



PICCARD . . . There is much to be learned. A series of opportunities awaits us.

NEWS NOTES

Alaskan Advisor — Walter K. Muench, engineering manager for Grumman's Ocean Systems Department, recently spent several weeks in Alaska as a consultant to the Sea Grant Proposal Committee of the University of Alaska's Institute of Marine Science. The Committee is preparing recommendations concerning Alaska's marine resources and their development potential to be incorporated in a proposal to the National Science Foundation for the establishment of a Sea Grant College in the state.

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Navoceano Package

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20,000 to 100,000 gamma range.

TRANSMISSOMETER — Intended to record the percentage of light absorbed by one meter of water, this equipment will be mounted on the top deck of the Ben Franklin. Meter readout will be recorded by the crewman-observer.

AMBIENT LIGHT METER — This device will measure the level of natural light, accurate to 10,000 lumens. A strip chart will record the information.

CURRENT METER — Designed to measure current speed and direction relative to the vehicle, this equipment is reliable from 0.05-6 knots, and through 360 degrees. Readout is on a strip chart.

TURBULENCE METER — Fluid velocity measured by temperature change to determine the current shear from the keel to the top deck of the boat is obtained by two sensors in the keel and another on the top deck.

Most of the scientific equipment operates on the submarine's 28 VDC or 110 AC current.



ON DECK — Three members of the Grumman Ocean Systems group pause on deck minutes after the submersible Ben Franklin was launched on July 26. Like an iceberg, much of the submarine is below water even when riding on top of the water. Fish in the harbor quickly became accustomed to the "intruder" and were visible in abundance around many of the submarine's 29 portholes.



INSIDER'S VIEW — Most striking interior feature of the Ben Franklin is its roominess. In addition to accommodations for six men for six weeks, the vehicle offers ample space for scientific, recording and measuring equipment.

News Notes

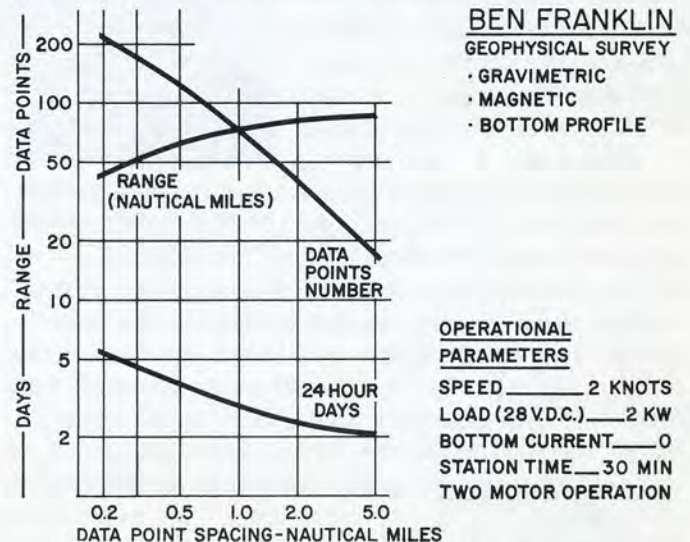
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Expansion — Grumman has expanded its marine test activities at the Port of Palm Beach, Fla., by leasing the remainder of the facility on the waterfront adjacent to Slip 2. The building, which houses machine shop, testing, storage and office areas totals 24,000 square feet. There is an area of approximately the same size for outdoor storage, parking and dockside testing activities.

On-Going Programs — Experience gained from the design and construction of the Ben Franklin is being turned to the design of fixed, semi-mobile and sub-surface laboratory habitats. . . . Another study program is concerned with subsea workover systems for deep ocean producing oil wells.

Plan Geophysical Survey Package For Ben Franklin Users

An instrument suit which will assist oceanographers in conducting marine geophysical surveys, is being prepared for the Ben Franklin, extending the data gathering capabilities of the submersible to gravimetric, magnetic and bottom profiling activities. Measurements in those fields can be made



continuously or at specific locations at the discretion of the user. For example, as shown in the graph, if readings are made every one-half nautical mile, the Ben Franklin can collect 120 gravity, magnetic and bottom profiling data points, over a range of 60 nautical miles and spend 3.7 days per dive. The number of dives needed to complete a given survey is dependent upon the user's total survey range requirements.

