

THE BEN FRANKLIN

A SUBMERSIBLE LABORATORY FOR THE 1970's

With national attention in the 70's focusing upon the environmental problems besetting Man and his planet, effective tools will be needed for the specialized jobs that must be performed above, on, and beneath the surface. Among privately-owned submersible vehicles, far and away the most advanced in existence is the Grumman Aerospace Corporation's Ben Franklin, with a record that speaks for itself.

In one year, it logged over 1,000 hours submerged, more than most vessels of its type. It has travelled at operating depths further than any similar vehicle—1,444 nautical miles at an average of 650 feet below the surface for over 30 days with six men aboard.

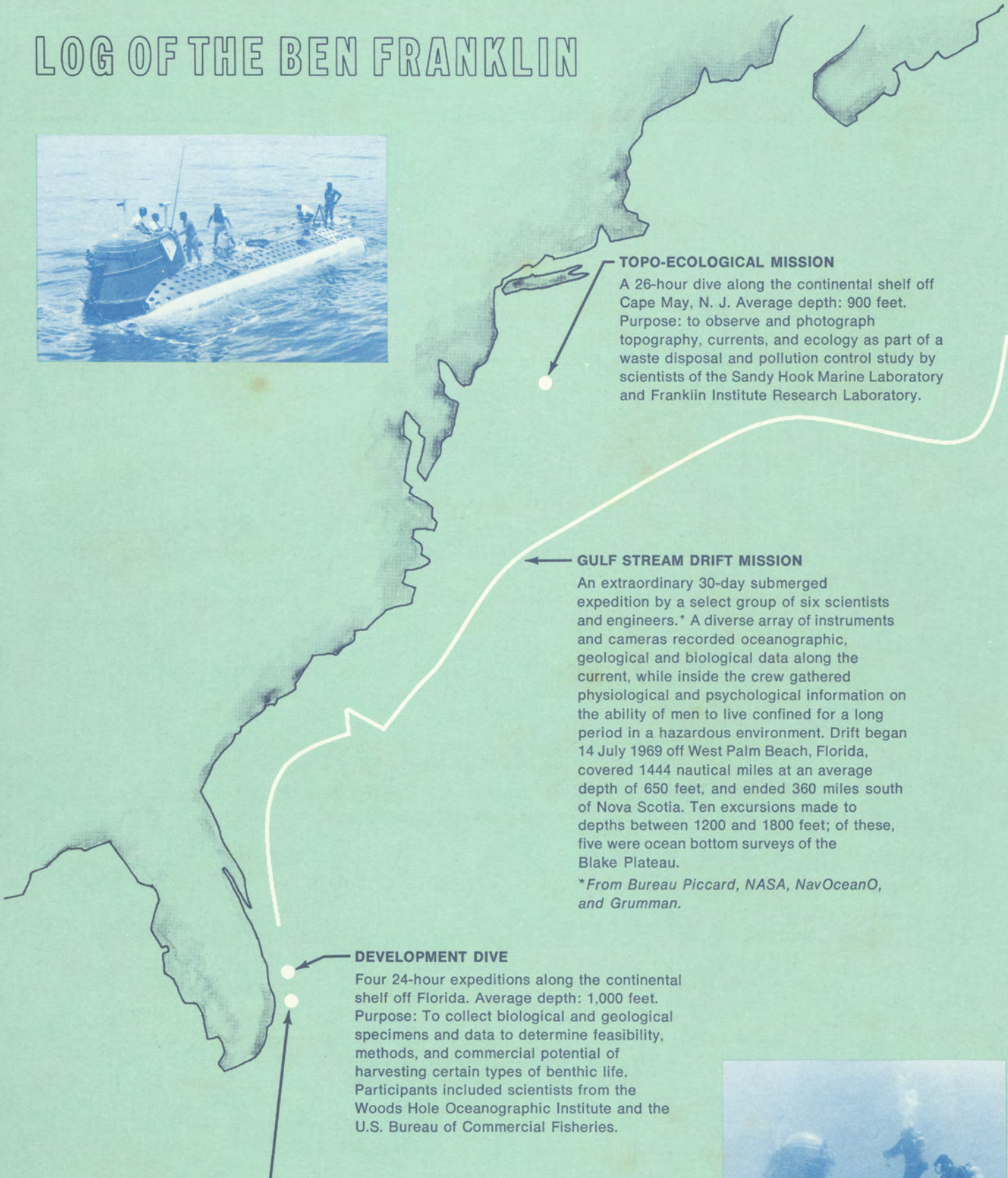
The internal dimensions and duration of the Ben Franklin remove one of the most serious operating constraints on all of today's research submersibles—size. It has the room and the life support to accommodate the personnel and equipment required to do the job — the best assurance of mission success.

Perhaps your organization is embarking on studies involving pollution control, fish population and life cycles, minerals exploration, or ocean engineering; or you may be interested in acoustic measurements or human behavior for military and space applications. If so, Grumman invites you to consider scheduling the Ben Franklin for your work.

Further information regarding the vessel and its availability may be obtained by contacting:

Marine Business Development
Grumman Aerospace Corporation
Bethpage, N. Y. 11714
516-575-2735

LOG OF THE BEN FRANKLIN



TOPO-ECOLOGICAL MISSION

A 26-hour dive along the continental shelf off Cape May, N. J. Average depth: 900 feet. Purpose: to observe and photograph topography, currents, and ecology as part of a waste disposal and pollution control study by scientists of the Sandy Hook Marine Laboratory and Franklin Institute Research Laboratory.

GULF STREAM DRIFT MISSION

An extraordinary 30-day submerged expedition by a select group of six scientists and engineers.* A diverse array of instruments and cameras recorded oceanographic, geological and biological data along the current, while inside the crew gathered physiological and psychological information on the ability of men to live confined for a long period in a hazardous environment. Drift began 14 July 1969 off West Palm Beach, Florida, covered 1444 nautical miles at an average depth of 650 feet, and ended 360 miles south of Nova Scotia. Ten excursions made to depths between 1200 and 1800 feet; of these, five were ocean bottom surveys of the Blake Plateau.

**From Bureau Piccard, NASA, NavOceanO, and Grumman.*

DEVELOPMENT DIVE

Four 24-hour expeditions along the continental shelf off Florida. Average depth: 1,000 feet. Purpose: To collect biological and geological specimens and data to determine feasibility, methods, and commercial potential of harvesting certain types of benthic life. Participants included scientists from the Woods Hole Oceanographic Institute and the U.S. Bureau of Commercial Fisheries.

PHILCO-FORD MISSION

New cameras and films for aerial and space photography were tested by Philco-Ford Company in a cooperative development project sponsored by the U.S. Naval Oceanographic Office. Purpose: to find new ways of gathering data on currents, upwelling and pollution at various depths.



CAPABILITIES

BEN FRANKLIN is ideally suited for missions in the following areas:

ECOLOGY *Assessment of the ocean environment.*

- POLLUTION Investigate the effects of waste disposal, and thermal disturbances.
- TOPOGRAPHY Assess the effects of undersea mining, sand and gravel dredging, and bottom emplacement of undersea hardware.
- OCEANOGRAPHY Collect parametric data, water samples, radioactivity data and photographic records.

BIOLOGY *Observation and sampling.*

- FISHERIES Assess resources to determine commercial value.
- LIFE CYCLES Study the life cycle and environments of selected species in order to better understand the controlling factors and improve commercial markets.
- HARVESTING Evaluate current techniques and new methods via in-situ studies to determine effectiveness and potential improvements.

GEOLOGY *Resource exploration of off-shore areas.*

- MINERALS Determine petroleum resources and availability of sand and gravel deposits for construction and beach control.
- MAPPING Survey and map undersea geological features to improve our understanding of earth structure and processes.

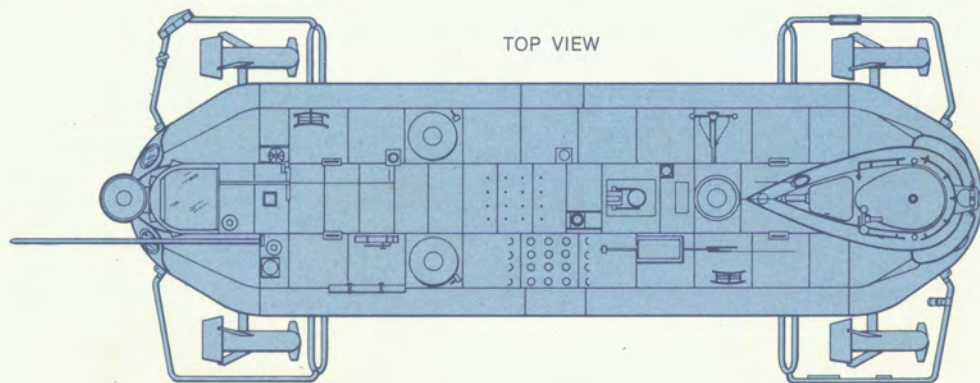
ENGINEERING *A laboratory facility for advancing ocean technology.*

- TESTING Determine practicability of engineering designs and undersea hardware systems.
- WORK Provide maintenance and inspection of undersea systems, retrieve selected objects, and deploy undersea instruments.
- SPACE ANALOG Test and evaluate space station hardware while providing physiological and psychological data on men living and working in a confined hazardous environment for extended periods.

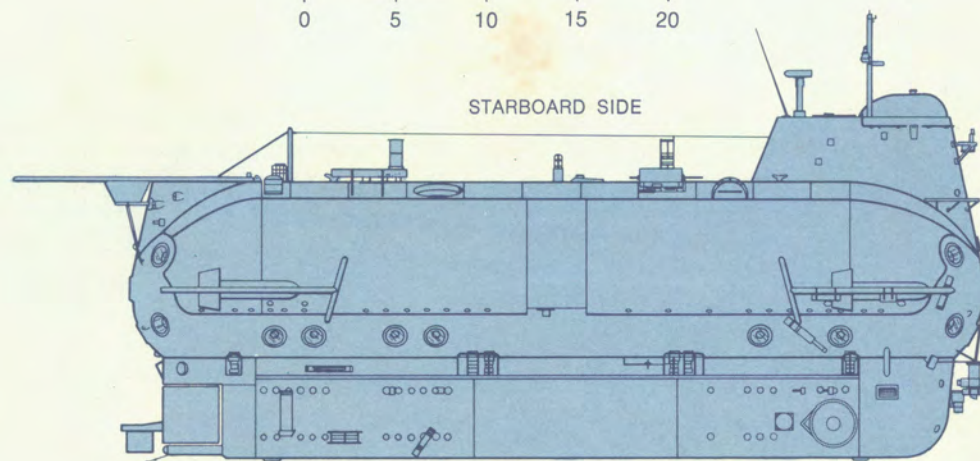
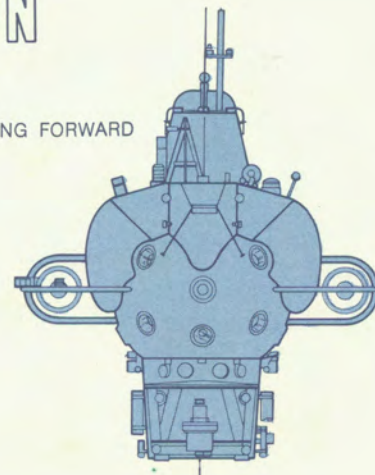
MILITARY *Research and development.*

- ACOUSTIC Provide a quiet observation platform for measuring baseline acoustic data.
- SURVEY Provide visual, sonar and photographic data of selected areas.

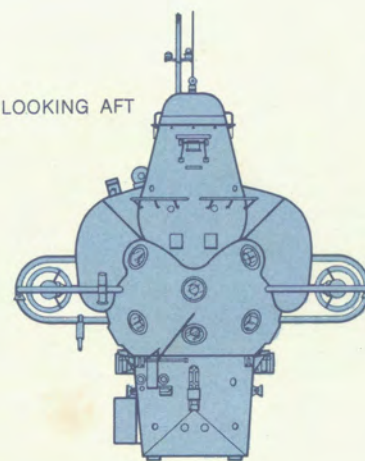
VEHICLE DESCRIPTION



LOOKING FORWARD



LOOKING AFT



VEHICLE CHARACTERISTICS

Displacement	138 tons	Pressure hull interior diameter	10 ft
Payload	10 tons	Access hatches (2); opening dia.....	30 in.
Length	48 ft 9 in.	Operational depth	2,000 ft
Beam — without motors	13 ft 4 in.	Collapse depth (test)	5,700 ft
— with motors	18 ft 6 in.	Viewports	29
Height	20 ft 0 in.	Accommodations	up to 12
Draft — hullborne	11 ft 8.5 in.		

The BEN FRANKLIN is a large submersible displacing 138 tons and providing over 3,500 cubic feet of internal volume. It can carry payloads of more than 18,000 pounds to depths of 2,000 feet. Batteries store 756 kilowatt-hours of energy, while the life support system can sustain up to 12 persons for missions of four weeks or greater submerged duration. The propulsion system consists of four 25-hp pods capable of driving the vessel at speeds up to 4 knots.

The interior basically is divided into the following three areas:

- Observation, mess and vehicle control area (forward)
- Life support, sanitary facilities, and electrical conversion and distribution equipment area (amidships)
- Scientific equipment and crew berthing area (aft).



GRUMMAN AEROSPACE CORPORATION
BETHPAGE, NEW YORK 11714