ENGINEERING RESPONSIBILITIES

Coast and Geodetic Survey

U.S. DEPARTMENT OF COMMERCE

John T. Connor, Secretary

ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION

Robert M. White, Administrator

COAST AND GEODETIC SURVEY

Rear Admiral James C. Tison, Jr., Director

COVER PHOTOGRAPH

The Survey Ship PATHFINDER is here charting safe channels in the Aleutian Islands. Shishaldin volcano, rising 9,387 feet above Unimak Island, is in the background.

Engineering Responsibilities

of the Coast and Geodetic Survey

Engineering responsibilities of the Coast and Geodetic Survey are primarily in the field of mapping and charting—the making of nautical and aeronautical charts for navigation. Field surveys and the collection of data necessary for this purpose have direct and far reaching effects on engineering in many different fields.

A nationwide geodetic control net, which forms a highly accurate and rigid framework for all types of maps and charts of this country, provides the local surveyor, the civil and the military engineer with elevations, geographic and coordinate positions, distances, azimuths, and directions.

This type of horizontal and vertical control, because of its accuracy and permanency, is used almost exclusively to locate our national and state boundaries. There has been an increase in the use of survey marks to reference private property boundaries for the same reasons. Highway engineers of several states have already specified this type of control as a requirement in the new Interstate Highway Program.

While scientists have long recognized the merits of geodetic surveying, it took the missile age to demonstrate to the military engineer the merits of geodesy as a tool. The Coast and Geodetic Survey has made many special surveys for military engineering projects. These generally involve the use of geodetic surveying methods of a high degree of accuracy, such as are required in missile tracking, camera stations, speed courses, model test basins, etc.

Hydrographic surveys, in addition to being basic nautical chart data, provide the engineers on waterfront construction with important and essential oceanographic information on depths of water, type of bottom, and tide and current predictions. These surveys are, also, of special importance in the exploration and development of natural resources from marine areas. The sanitary engineer will find the circulatory current surveys now made by the Bureau a useful tool. The remote tidal warning system now installed at many seaports saves thousands of dollars in property loss by giving advanced warning on abnormal high tides. The seismic sea wave warning system in the Hawaiian Islands has already saved millions of dollars.

Gravity and astronomic observations provide basic data for geodetic surveys and the studies of the size and shape of the earth. Gravity data are important in analyzing the effect of the earth's external gravity field on the newly developed inertial navigation and missile guidance systems.

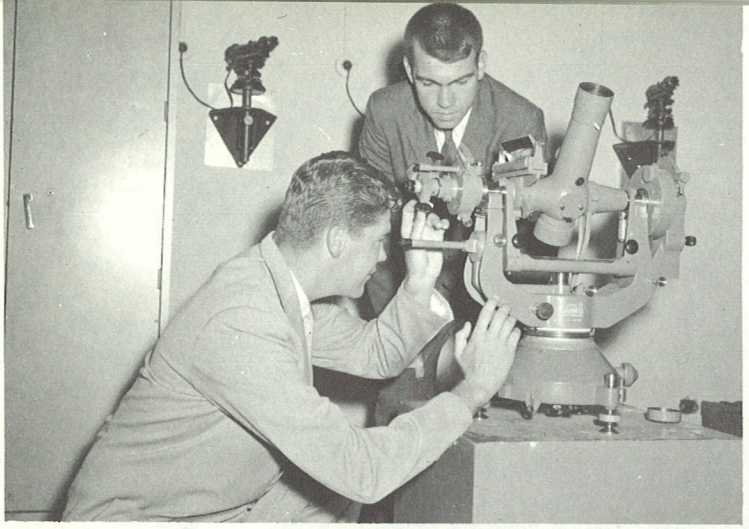
Observations are made of the earth's magnetism to supply essential information to the navigator, the land surveyor, and the radio engineer.

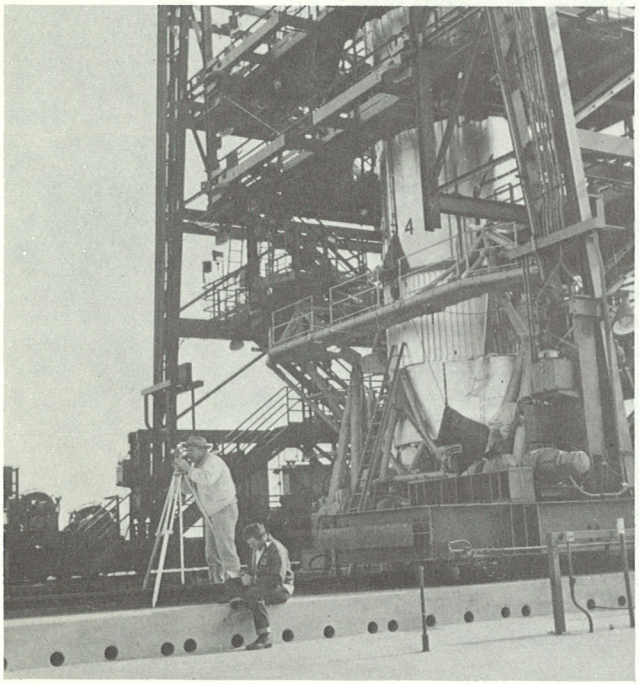
The Bureau's coastal planimetric and topographic maps of present and past years are invaluable to the shore erosion engineer and are often introduced in court cases involving mean low or mean high water lines. Formerly these maps were made by planetable, but now they are made by photogrammetric methods.

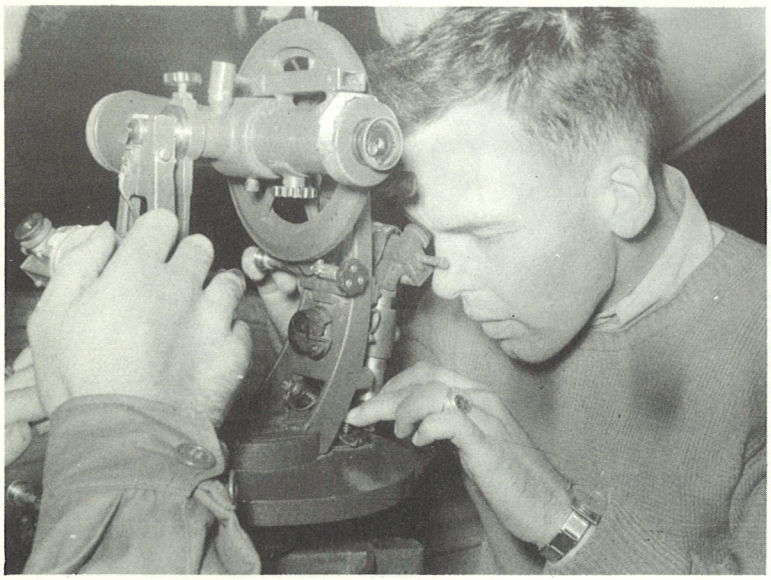
Vibration tests on buildings made in connection with the Bureau's seismological observations have provided the structural engineer with useful basic data which have affected building codes in areas subject to earthquake disturbances. Seismographic monitoring of nuclear and high explosive blasts has made great contribution to the military and the construction engineer.

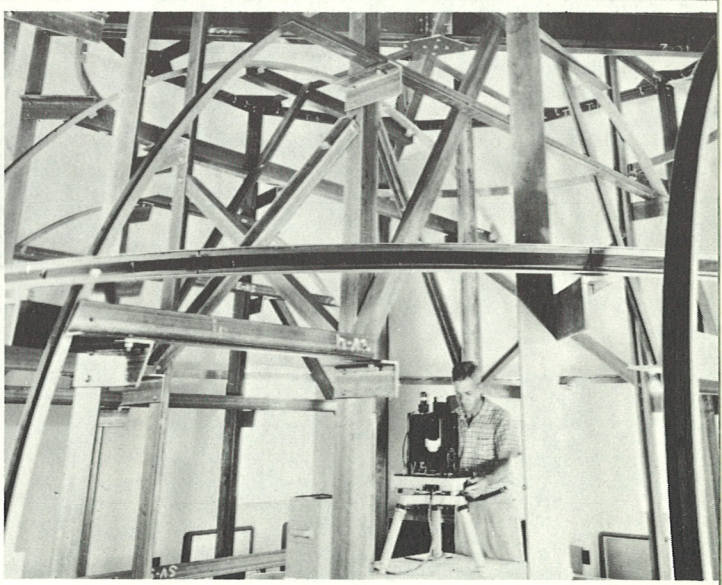
At the major commercial and at many military airports, obstruction plans are made from field surveys by this Bureau to provide data for the regulation and control of aircraft loading vital to aviation authorities and safety engineers.

While most of the work and products of the Bureau are directed toward and for the use of air and ship navigation, the Coast and Geodetic Survey is ever mindful of its engineering responsibilities in many different fields.



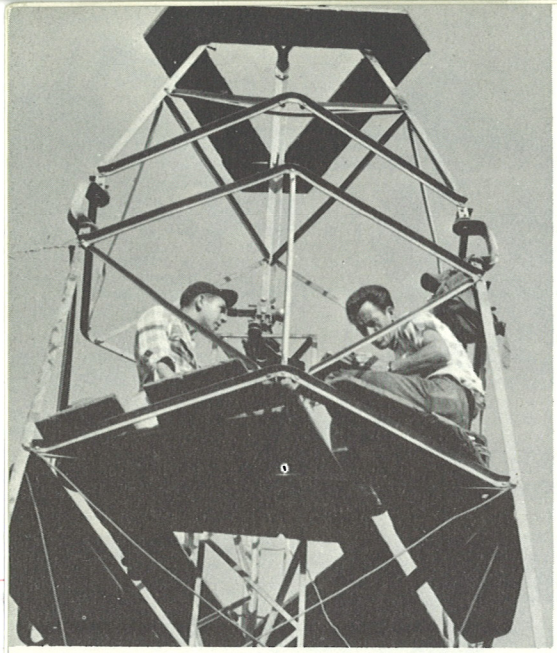


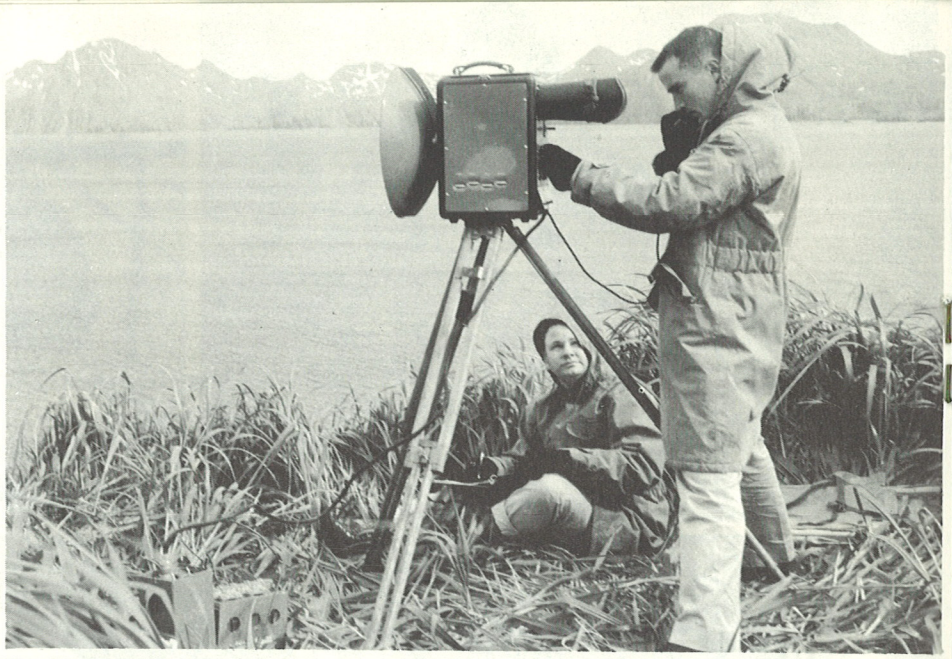


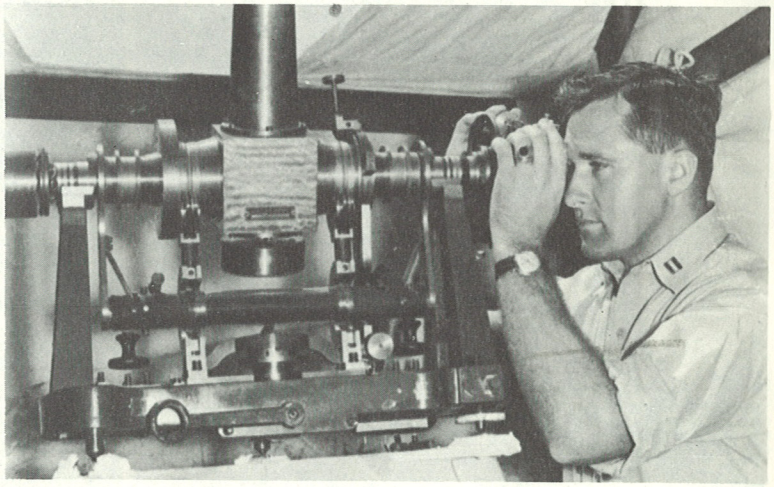


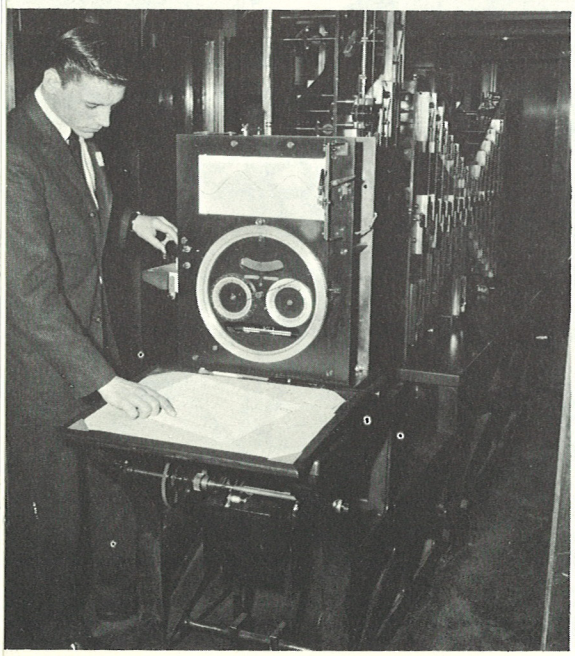
Testing astronomic theodolite.
Geodetic surveying for missile control.
Observing triangulation.

SCUBA diving in oceanographic studies.
Underground seismological observations.
Research in magnetics.







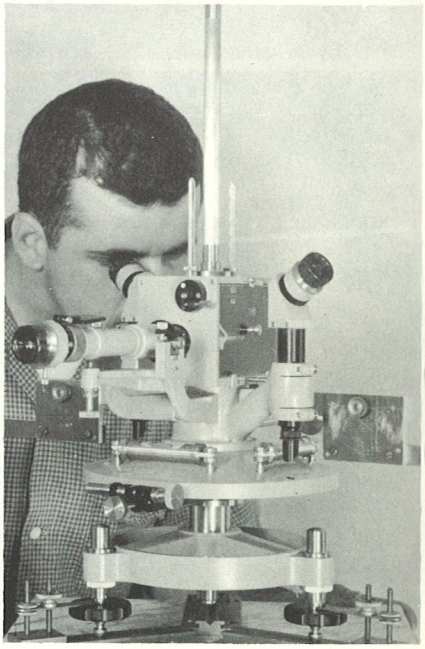


Observing triangulation from top of portable steel tower.

Alaskan Surveys using helicopters.

Tide predicting.

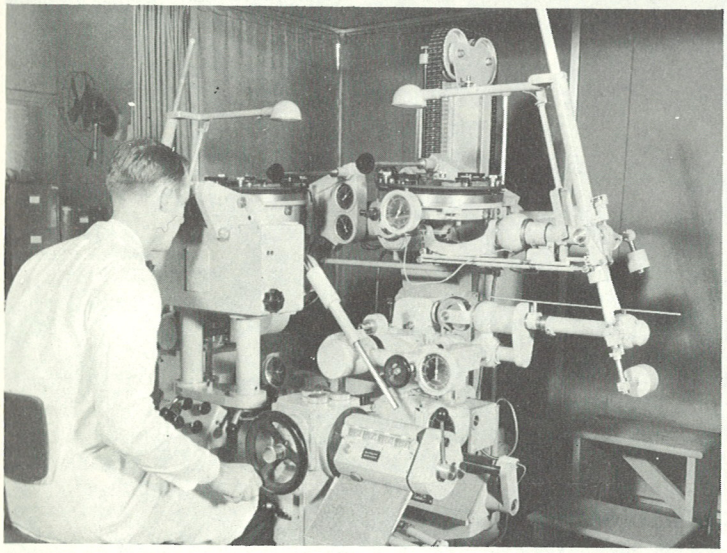
First order leveling.



Measuring accurate distances by electronics.

Astronomic observing.

Observing magnetics.



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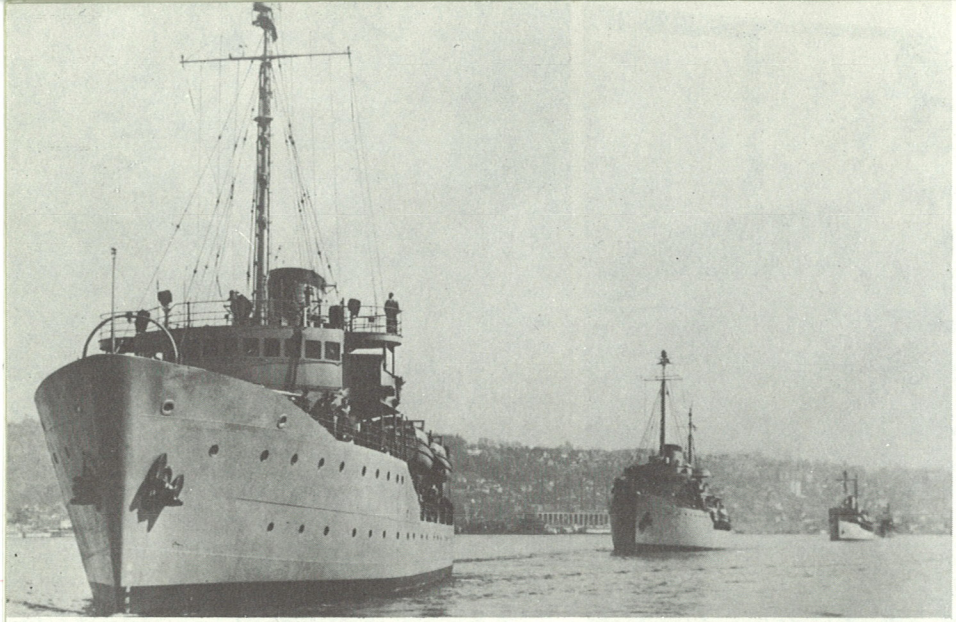
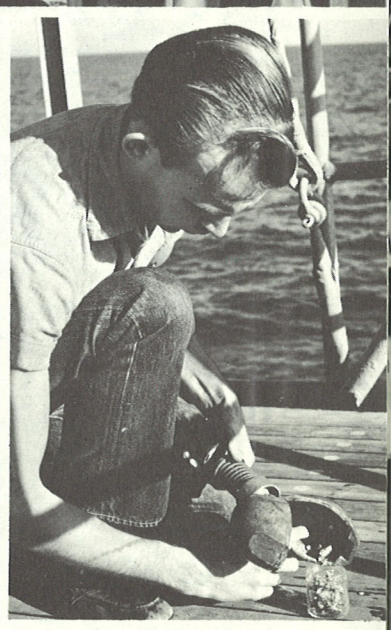
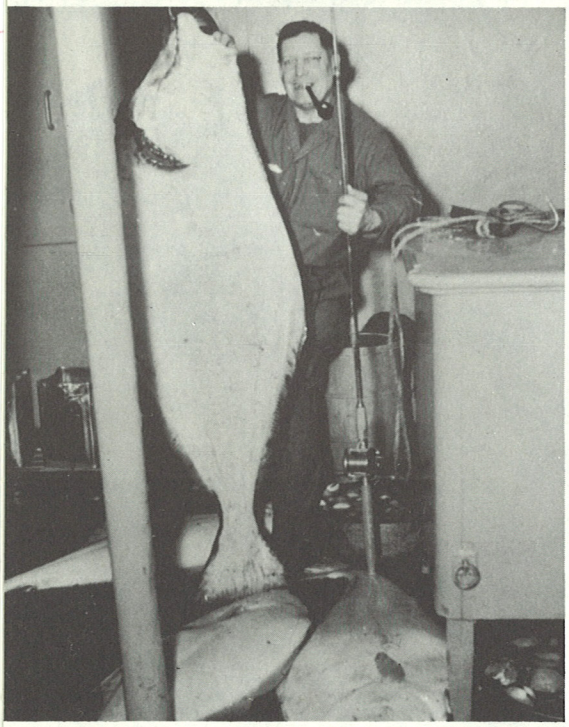
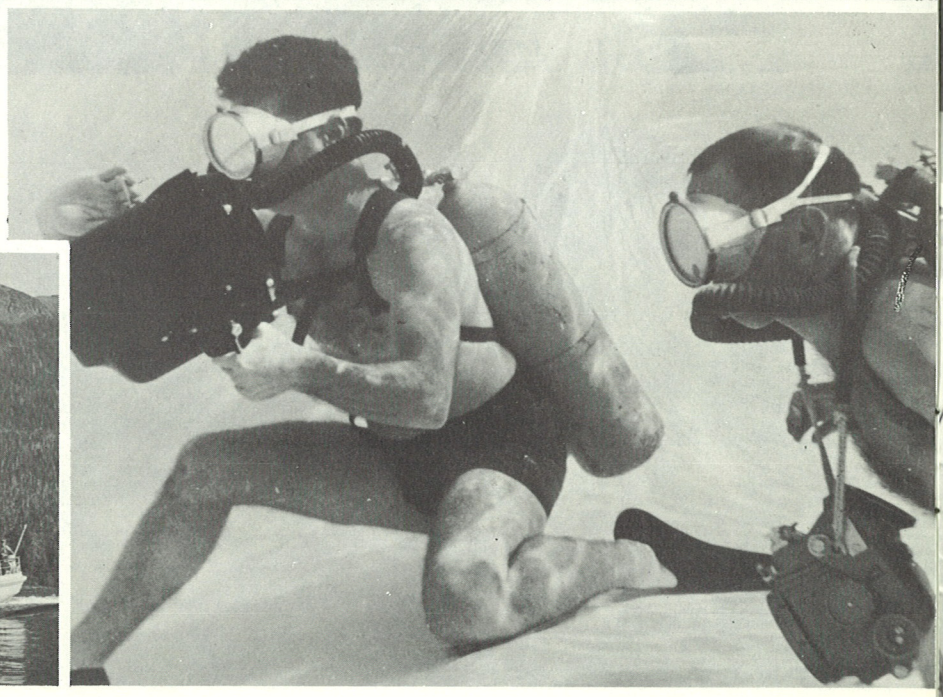
Aerial photography.
Contouring aerial photographs.
Field inspection of aerial photographs.

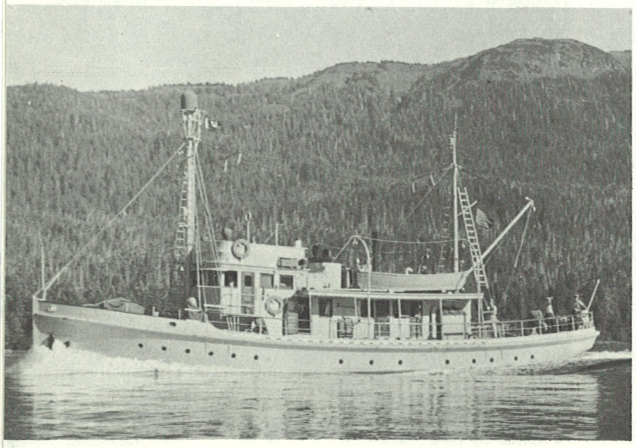
Photogrammetry.
Magnetic observations at airport.
Leveling.







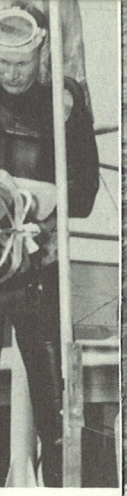




Survey fleet sails for working grounds.
Halibut.
Survey ship *Patton*.

Servicing depth recorder.

Servicing ocean current meter.
Sampling ocean floor.
Underwater photography.



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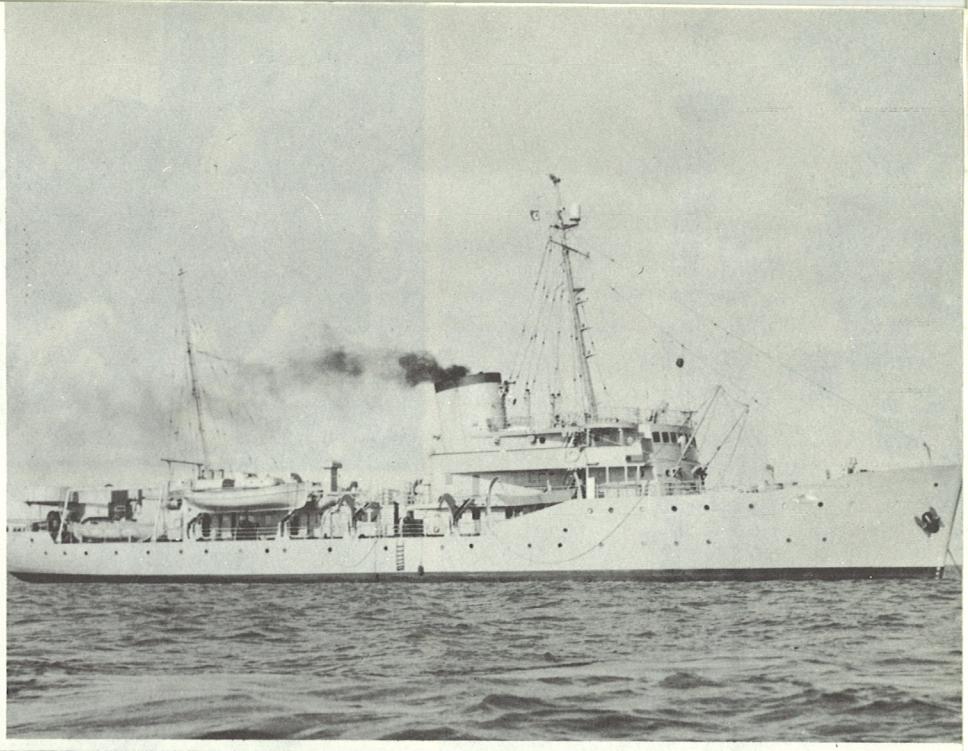
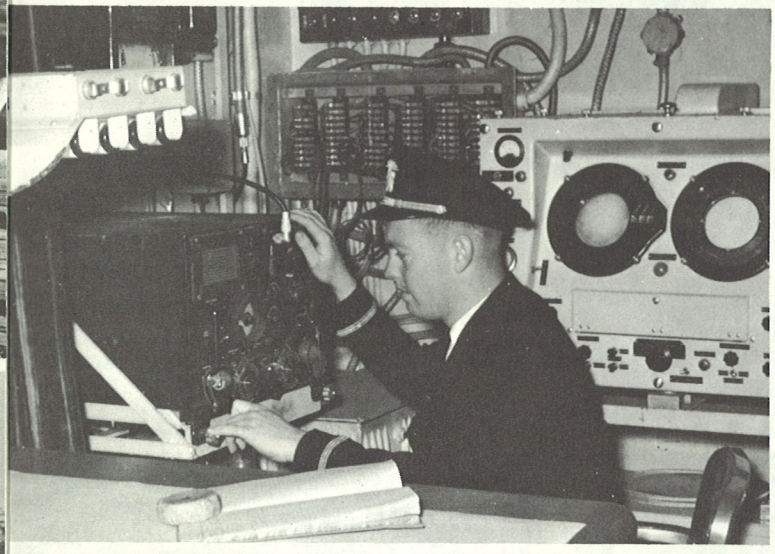
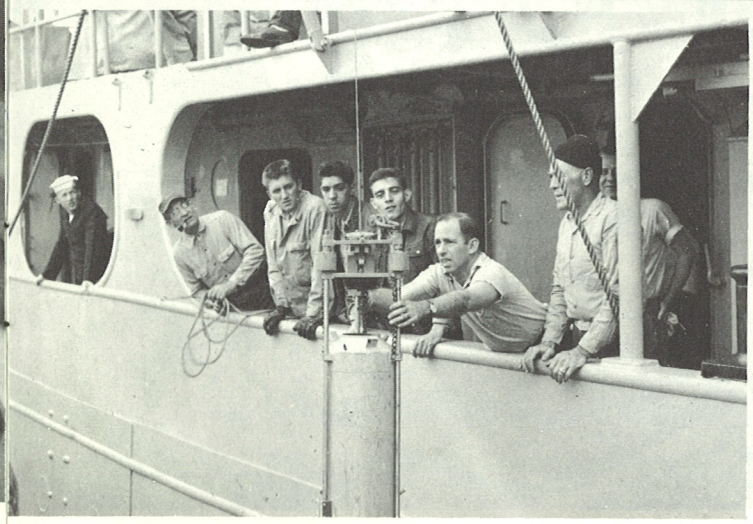
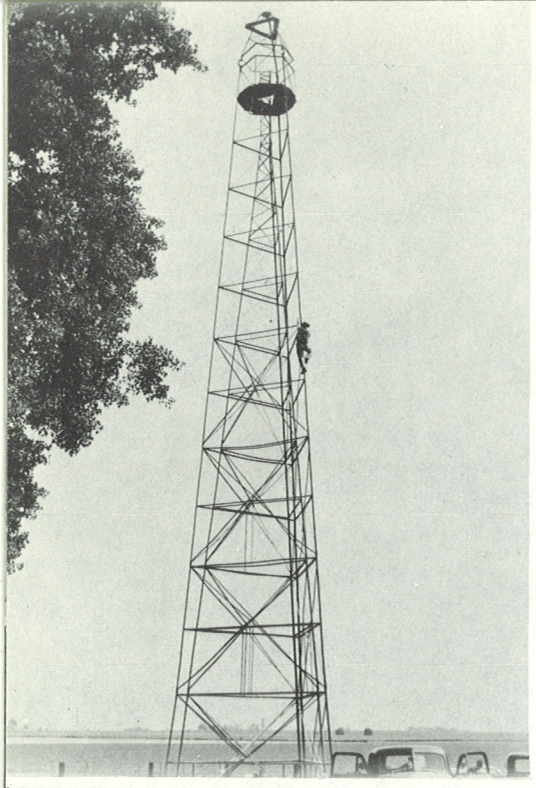


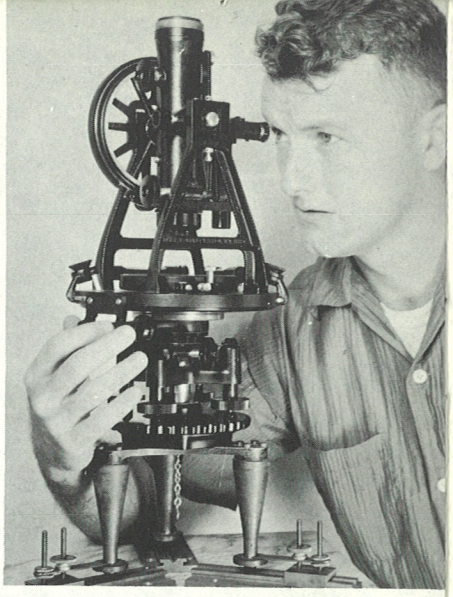


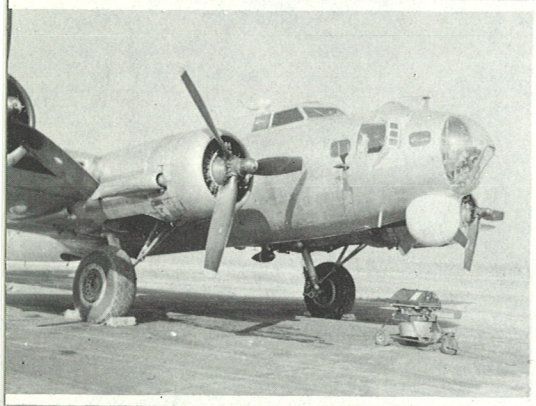


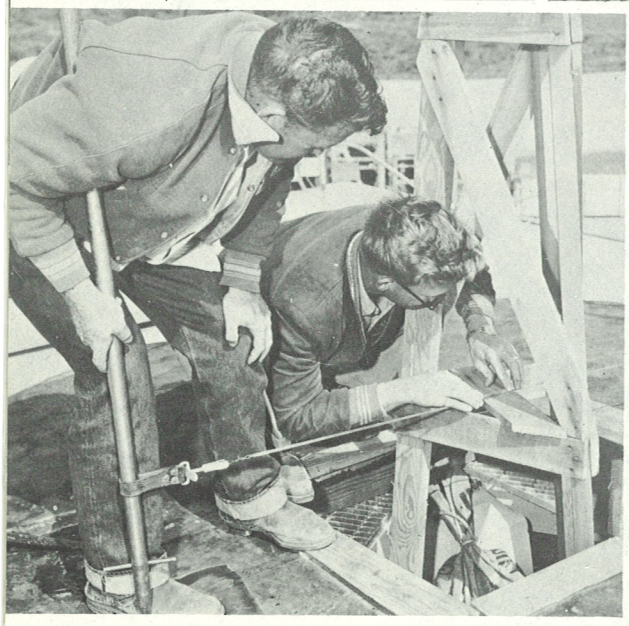
Wire dragging for wrecks.
Locating ship's position by Shoran.
Sampling bottom-water from ship *Hydrographer.*

Survey ship *Pathfinder.*
Plotting ship's position on chart.
Mountain climbing in Alaska to establish survey station.









Portable observing tower.

Aerial photo plane.

Measuring a base line.

Oceanographic studies.

Triangulation.

Transit magnetometer.

Tidal observations.

Junior officers being instructed in chart compilation.

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