

General Dynamics/Convair

**IN AND OUT**—An artist's conception shows a seaplane that could fly in the air, submerge and cruise underwater designed by General Dynamics Corporation in San Diego.

## ENGINEERING

## Flying Submarine Designed

A two-man jet-powered airplane that can fly in the air and then submerge and travel underwater powered by battery-run propellers has been designed for the U.S. Navy.

► A JET-POWERED airplane that could dive beneath the waves and cruise underwater as a submarine has aroused the interest of the U.S. Navy.

The two-man craft that looks more like a seaplane than a submarine would be powered by battery-run propellers while under the surface.

A jet engine mounted on struts above the hull would be used for flight, while two more engines above the wings would be fired for boost in takeoff.

To go from flight to underwater cruising, the craft would first land on the water like a conventional seaplane.

The jet engines would then be sealed off and the hollow wings, tail and sides of the hull would be flooded like the ballast tanks of a submarine, causing the craft to submerge.

The design, reported at an anti-sub warfare conference co-sponsored by the Navy and the American Institute of Aeronautics and Astronautics in San Diego, calls for a range of 300 to 500 miles in the air, with speeds between 150 and 225 knots. Underwater range would be about 50 nautical miles, 75 feet below the surface, at 5 knots. The craft could carry a payload of from one-quarter to three-quarters of a ton.

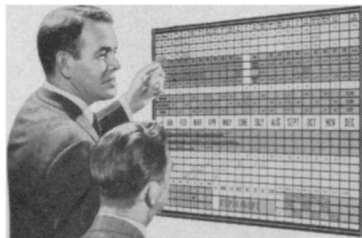
The biggest problems facing the builders of any such "sub-plane" are buoyancy, emergency escape and survival, and stability in both air and water, said C. R. Tuttle,

chief project engineer for Convair division of General Dynamics Corporation, San Diego. The company conducted a six-month study on the project for the Navy.

A U.S. Air Force program investigating the strategic role of submersible aircraft was reported by Roger P. Johnson of the Rand Corporation.

• Science News Letter, 87:221 April 3, 1965

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## Nature Note

### The Marine Iguana

► UNFORTUNATELY FOR the marine iguana, both its source of food and its worst enemies dwell in the sea. This may account for its tendency to bask on the volcanic beaches of the Galapagos Islands, west of South America.

The marine iguana enters the ocean to feed upon seaweed only once every 24 hours. There its enemies are sharks and other large fish. In heavy surf, this crested, fierce-looking creature dives for the bottom and clings to rocks with its powerful claws. This is the way it walks to shore.

Resembling a prehistoric monster, *Amblyrhynus cristatus* is brown with lighter brown spots when hatched, but in adulthood its color is dark brown or black.

Only in courtship does the scaly hide become more colorful. The male engages in a courtship habit of bobbing his head.

The marine iguana maintains its preferred body temperature of from 95 to 100 degrees Fahrenheit by changing body positions, Dr. George A. Bartholomew, University of California at Los Angeles zoologist, reported.

Gregarious animals, the marine iguanas intermingle freely with sea lions and crabs and become quite tame when approached by humans crawling on hands and knees.

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