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SAILING THE WINGED "SEABIRD"
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Sailing the Winged "Seabird"

Plan & Kit for Catamarans from

W.A. DICKENS & SONS, LTD., HONOLULU, HAWAII

COMBINING the sailing secrets of the ancient Polynesian with modern principles of aeronautics, "Woody" Brown and Alfred Kumalae of Honolulu have built a 40-foot catamaran, believed to be the largest and fastest in the world today.

They provide thrills for the tourists, and dollars for themselves, by skimming passengers over the waters of Waikiki at better than 22 knots.

Woody first made a name for himself as a glider champion in Kansas, where he set a world's distance record. He came to Honolulu shortly before the Japanese attacked Pearl Harbor.

On Christmas Island, as a war worker, he watched natives build a catamaran after an ancient design. Completed, he saw it sail with extraordinary speed.

Here was something that made his glider seem tame. He decided to do research on

By Richard M. Botts

Polynesian catamarans, and work into the design of one some of his knowledge of aeronautics. He wanted to build the fastest catamaran the world had ever seen.

He found in Alfred Kumalae, a Hawaiian lad, the partner he needed, and together they worked out the design for their new craft at Waikiki. They followed the ancient Polynesian design exactly, except for the wing innovation. They built it entirely of plywood. It took almost a year to complete and dug into their savings to the not inconsiderable sum of \$4000. They christened it "Manu Kai," which means seabird in Hawaiian.

The craft's remarkable speed is due to several factors.

One is the light weight of the catamaran (just over 2000 pounds) compared with other craft of equal size, giving it a draft of only 15 inches. The small draft and light



One man easily handles the 40-foot catamaran. Lines from both jib and mainsail run into the small cockpit

weight leave little drag or weight for the sails to pull over the water.

The catamaran is able to outdistance other **sailing** craft because it keeps its stability and sails in an upright position. Conventional sailboats heel over in even a moderate breeze and spill air off the top of the sail. Because the catamaran keeps upright, the wind flows off the back of the sail instead of spilling off, giving it added speed and thrust.

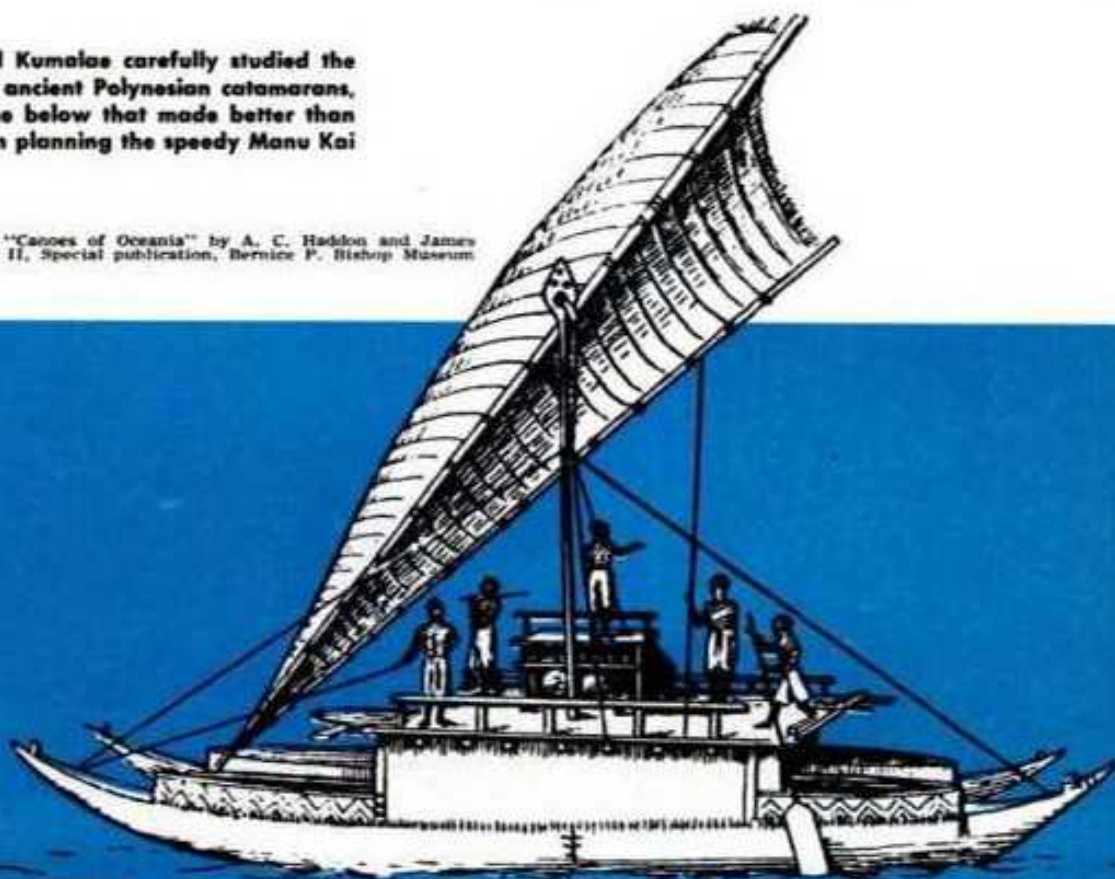
Trials proved the most speed could be obtained in a beam wind or a close reach.

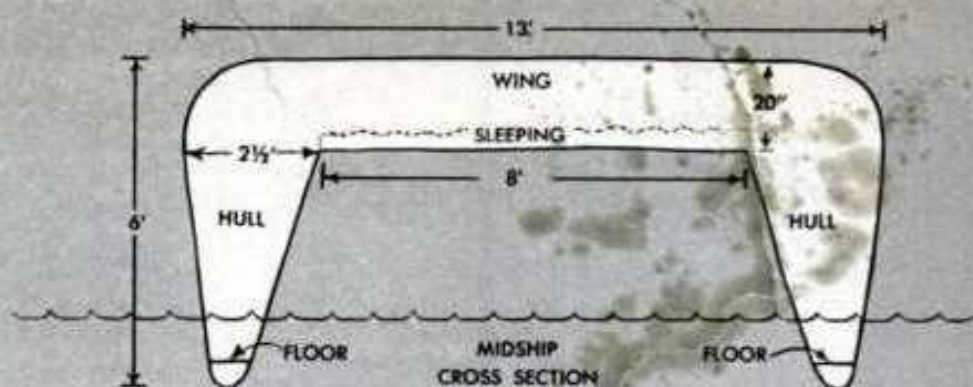
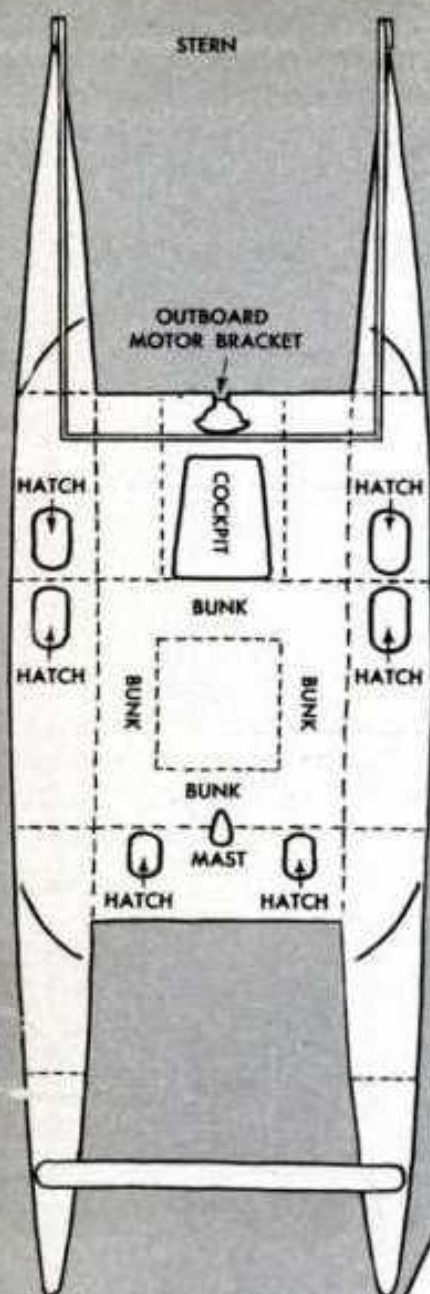
Taper ratios run from about 3 to 1 in ordinary sailboats to as high as 9 to 1 in racing yachts. In contrast, the Manu Kai's hulls have a 20 to 1 taper ratio. This makes the craft long, slender, and very fast.

Woody's innovation, the wing, besides holding the two hulls together, is designed to add speed. It is skin stressed and internally braced like an airplane. When the

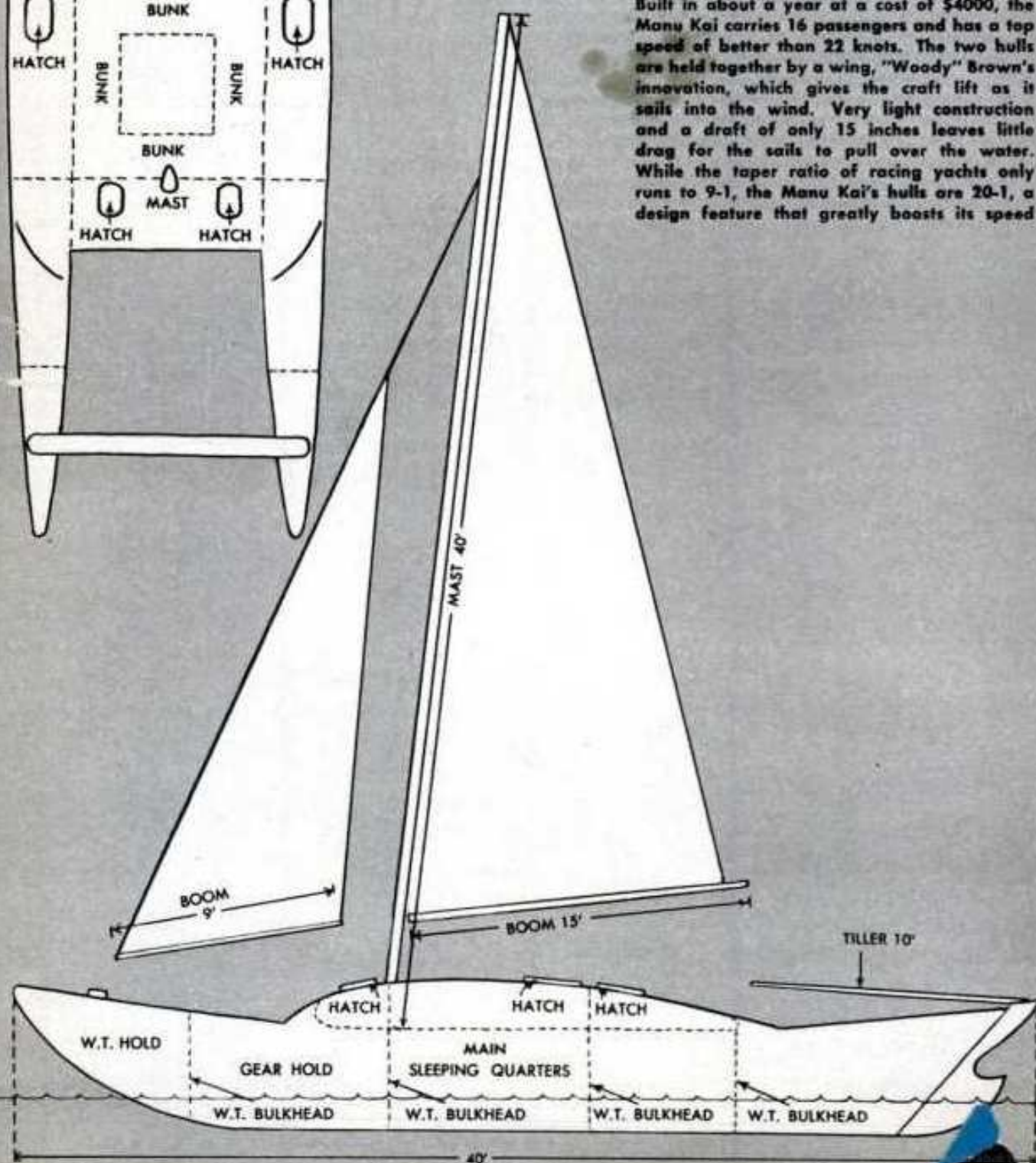
Brown and Kumalas carefully studied the designs of ancient Polynesian catamarans, like the one below that made better than 20 knots, in planning the speedy Manu Kai

Sketch from "Canoes of Oceania" by A. C. Haddon and James Hornell, Vol. II, Special publication, Bernice P. Bishop Museum





Built in about a year at a cost of \$4000, the Manu Kai carries 16 passengers and has a top speed of better than 22 knots. The two hulls are held together by a wing, "Woody" Brown's innovation, which gives the craft lift as it sails into the wind. Very light construction and a draft of only 15 inches leaves little drag for the sails to pull over the water. While the taper ratio of racing yachts only runs to 9-1, the Manu Kai's hulls are 20-1, a design feature that greatly boosts its speed





Its comparatively light weight and complete streamlining allow the catamaran to ride high at all times

The two forward sections of each hull are used for storage space for the lines, anchor and fishing gear.

The center part, comprising most of the wing and the two center sections of both hulls, provides the living and sleeping

quarters. This main section will sleep four. Two small built-in chairs, a desk and clothes pegs make up the furnishings.

The after sections of the hulls sleep one each. They, too, have plenty of room for clothing and additional gear.

The catamaran rides the sea very easily, partly cutting through, but mostly riding over the waves. This is due to the light weight and draft and because the twin hulls are very sharp.

A round trip open-sea sail of almost 200 miles in rough weather between the Islands of Oahu and Maui has convinced Woody of the catamaran's seaworthiness under adverse conditions.

Built entirely of plywood, the winglike center section is 8 feet wide and 20 inches thick



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craft sails to windward, the wing, an airfoil, lifts the catamaran, thus reducing the weight in the water and increasing the speed.

What makes the *Manu Kai* so unusual and astounding to the yachting fraternity is the lack of either keel or centerboard that mark other modern catamarans.

Until the "seabird" was built no modern catamaran had been able to prevent leeway without the use of a keel or centerboard. One was built without keel or centerboard, but it made too much leeway and had to be refashioned.

The secret lies in the unsymmetrical hulls, designed in the old Polynesian fashion. The inboard sides are curved, the outboard sides are straight up and down, making a hydrofoil of the hulls. When a hydrofoil is pushed through the water, it lifts, like an airplane wing, and prevents leeway.

Another convenience for singlehanded sailing of the *Manu Kai* is her small amount of sail area and short 15-foot boom for the mainsail and six-foot boom for the jib. It uses only 370 square feet of sail, against some 430 square feet in the latest Herreshoff catamaran developed in 1945. Despite this it is considerably faster than Herreshoff's 15-knot craft, but no official speed runs have been made.

As in all catamarans, a double rudder is needed for greater control. If one hull and rudder were out of the water, the opposite rudder would still provide control.

From each rudder a long tiller runs to the after end of the wing. These tillers are connected by a 10-foot crossbar, making it possible for the helmsman to steer from any position on the after-section of the wing, as the beam of the craft is only 13 feet.

Both the hulls and wing serve as stowage space and living quarters.

The catamaran has five watertight compartments, each accessible from a hatchway.



Six can be slept comfortably in the craft. Four are put in the wing section, which is entered by the hatches on deck, and there is space for one in each of the after hulls. Below, the *Manu Kai* carries only 370 square feet of sail, which is considerably less than half of that carried by one of the fastest catamarans developed in the early '30s.

