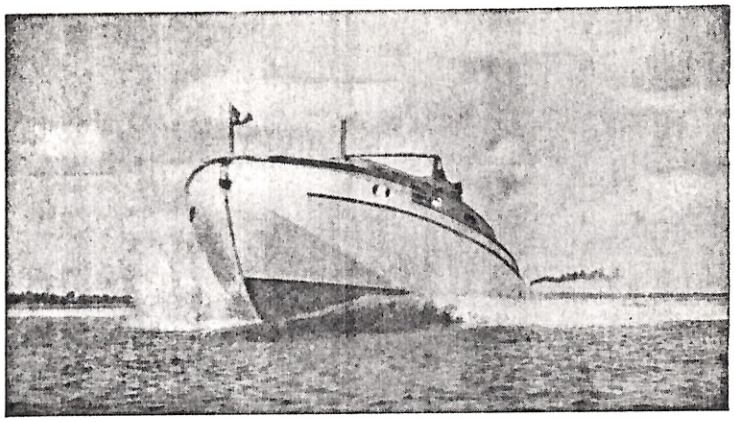
HULL DESIGN



A small craft cruising at 21 knots with a weight-power ratio of 55 pounds per horsepower

This definitely does not mean that cost per mile is necessarily higher in the planing range. As a matter of fact, the speed normally developed by the combination of one horse-power to seventy pounds or less of boat, automatically results in a fuel mileage which places the planing hull in a very reasonable competitive position.

A common misconception regarding fast hulls seems to be that added speed can be obtained with similar power and weight simply by shaping the hull to the straight lines of a planing bottom. Undoubtedly this fallacy has led to an endless number of boats which are slower than necessary but at the same time stir up a lot of fuss and spray to give a fair illusion of speed. There is no bypassing the hard fact that the hull which planes must buy that speed with either more power or less weight.

However, speed alone is not the only reason for the planing hull form. Speed may be spectacular but the manner in which a boat performs at sea is of deeper significance in cruising types. The out-and-out racing hull which will stay together long enough to break a world's record in sheltered waters is indeed newsworthy for the day but it is only further proof that high power and low weight can make even a barn fly.

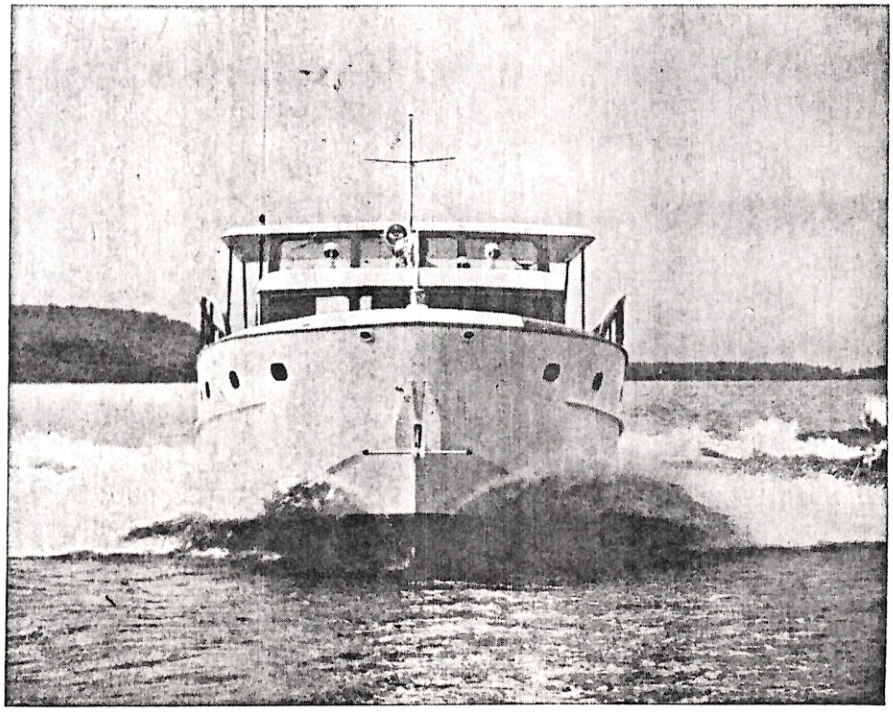
The really interesting fact of a planing hull's performance at sea is the combination of dynamic forces which result in a steadiness and freedom from roll unapproached by displacement type hulls. This effect begins as soon as enough speed has been gathered to cause a clean break of water behind the transom. An increase of steadiness comes from the fact that the flow lines created by a planing bottom are similar to those made by a much longer hull of displacement type. The smooth depression made in the water aft of a fast moving transom is about the same as if it were filled by a longer but slower moving hull. As is well known, small increases in hull length result in large gains in stability. Thus a 40-foot planing hull with an induced length of water flow behind it of, say, 30 feet is equivalent in steadiness to a displacement of 70-foot length, a really tremendous gain.

The overall design problem is largely one of combining the light weight, flying barn door with a sea-kindly bottom which will soften the blows of a very old and wrinkled ocean. With speed assured by either more power or less weight, and the more elusive quality of soft riding worked out, the planing hull emerges as a creation commercially worth while on its own merits.

The question constantly arises as to when to think in terms of displacement hulls and when to start reaching out for high performance. A categorical answer is obviously impossible but the factors which certainly must be considered will include cost all along the line, size of vessel and the intended service.

For example, consider the owner who wants, say, fifteen knots for a cruising speed. He can have this either in a displacement hull of 60 feet or more in length by perhaps 9-foot beam, or he can get it with a 40-foot planing hull about 12 feet wide. Weight, cost, and accommodations could run about the same although probably the shorter hull would tend to cost less, even with identical engines. As to which form should be selected, let final decision be made after some further facts are presented.

To take an actual example of a more common borderline problem, consider a well known standardized 53-footer



The Burger 53 cruising at 16 knots with a weight-power ratio of 120 pounds per horsepower