if greater area of lateral plane aft of midships remains, is less subject to yaw.

Intelligent design approach to the problem begins with study of the lateral plane normally provided by deadrise alone when the hull is in planing position. This basic area is beneficial to seagoing performance in direct proportion to its extent, and may usually be substantially increased and balanced by the proper design of a docking keel. The total of the effective lateral area so provided should be distributed and balanced as shown in Figure 27. The optimum net area of lateral plane, that is, the effective area after deductions for lift forward and low pressure above the after chines, appears to be in the neighborhood of 23 per cent of the area of horizontal waterplane at the still-water load line. More than this appears to be of decreasing value, but less area definitely accounts for a proportionate reduction in those seagoing qualities derived from the reaction of lateral plane.

Monohedron Lines

The word *monohedron* is not intended to indicate a bottom shape peculiar to any one designer nor exclusive with any one builder. Rather, it is a theoretical characteristic incorporated in greater or lesser degree in all planing bottoms. Its derivation is from *hedron*, meaning a geometrical figure having any number of planes. Since the theoretically ideal shape for planing on the water surface is a figure of constant section all in one plane or with monohedral angular characteristics, *monohedron* becomes a logical term.

In order that a plane shall have as nearly perfect monohedral relationship to the water as possible, it is necessary that a maximum of its running lines shall be straight and parallel with each other. Referring to Figure 28, it is evident that all sections, or station lines, of the afterplane area between diagonals *A* and *C*, coincide throughout their major lengths. Parallelism among station lines on the body plan indicates similar parallelism among the running lines on the profile. The area inboard of diagonal *C*, being a submerged body, may be hydrofoiled for least resistance as indicated by the shape of diagonal *D*. The docking keel thus formed has, by its hydrofoiled running lines, transformed an area of potential warpage, and therefore of suction, into shape which, because of being submerged, adds only a proportionate skin friction to the total resistance.

In the profile is shown again the monohedron characteristic of par-

allel running lines. The diagonals have been plotted both normal to their own planes and also as viewed in profile, better to illustrate the true monohedral angular characteristic of the planing surface. The entire pressure surface of the plane and the whole keel appendage are therefore operating under conditions most conducive to constant lift

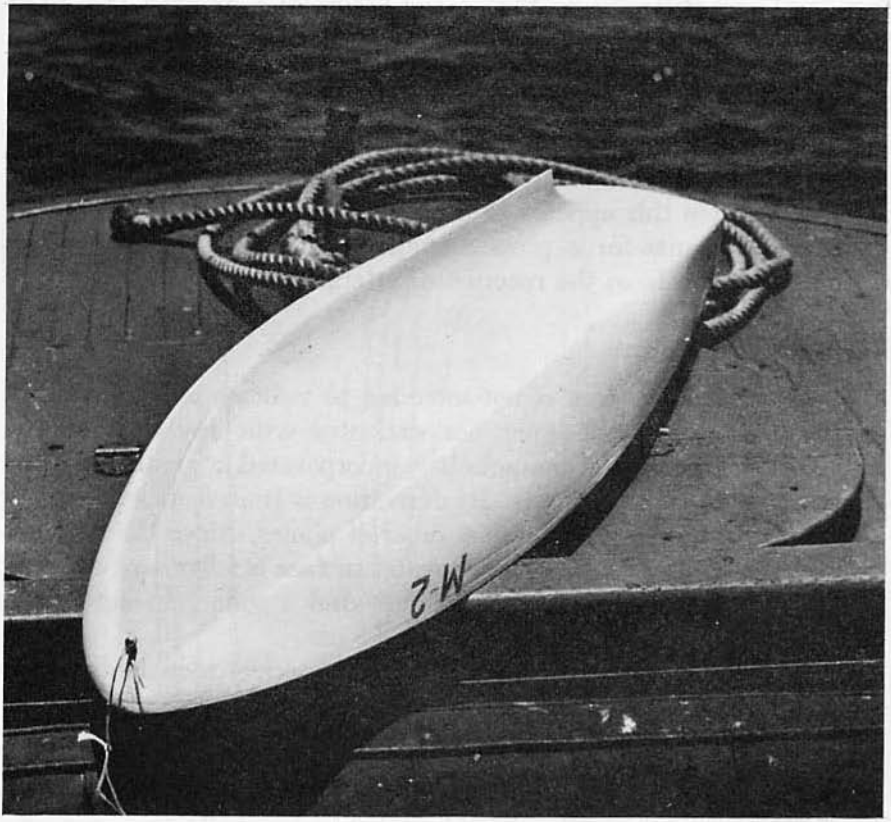

FIGURE 29

and least suction. Figure 29 is a photograph of the model built from these lines.

A general procedure for drawing monohedron lines is somewhat as follows: With aspect ratio and beam determined, draw the chine in plan view, keeping the widest beam between stations 5 and 6 with the beam at station 10 about 85 per cent of the maximum. In the case of