

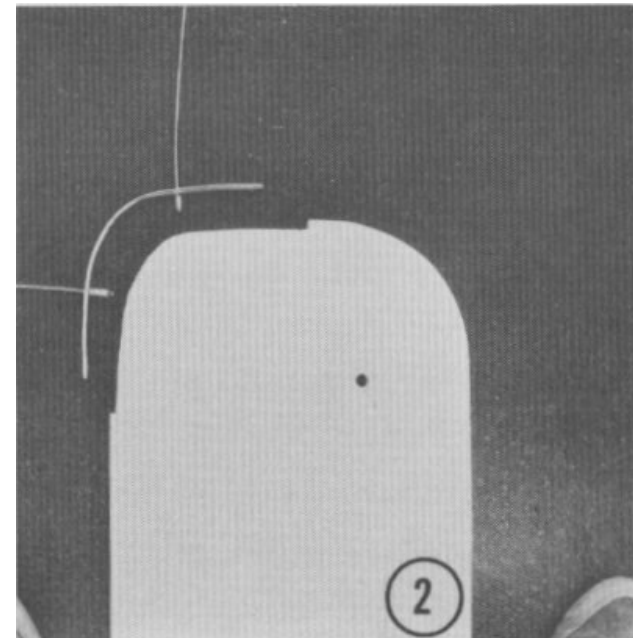
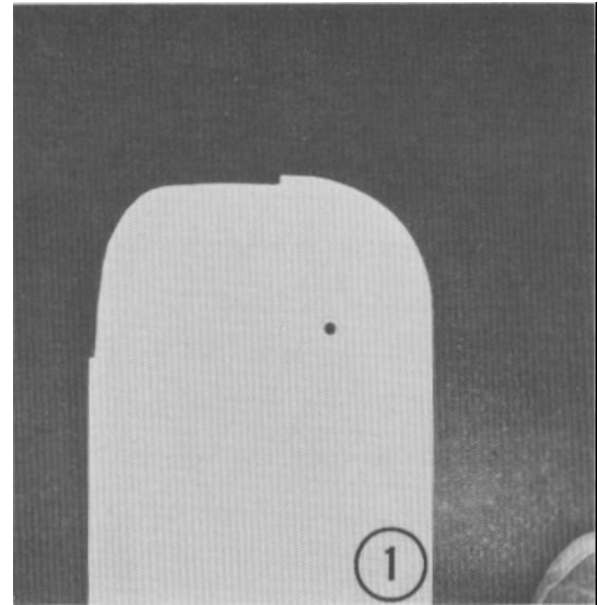
DS II CENTERBOARD CONTROL FOR RACING

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Centerboard control during racing has been the bane of many DS II owners for some time. Our analysis of the problem revealed several engineering defects, and our aim was to correct these errors and remove the awkward operating features of the device. The DS II board is normally controlled by two lines; one to lower and one to raise the blade. A single cleat on the starboard side of the trunk is placed there by the manufacturer to secure the governing line.

In order to fully examine the board, the main bolt is removed through the cockpit floor inspection ports and the board is extracted from the slot. The control wires are permanently imbedded in the board and, unless they are cut, the board cannot be completely separated from the hull for servicing. Further, the purchase angle is minimal for each wire and they shear directly against the fiberglass resin. Under racing conditions our control wires tore longitudinally through the board, which began to split. Also, the wires would stray from the board edge and jam between the board and trunk.

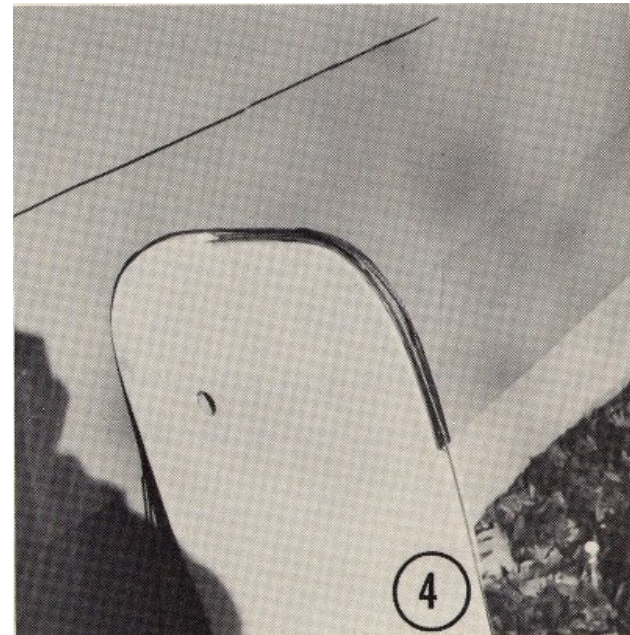
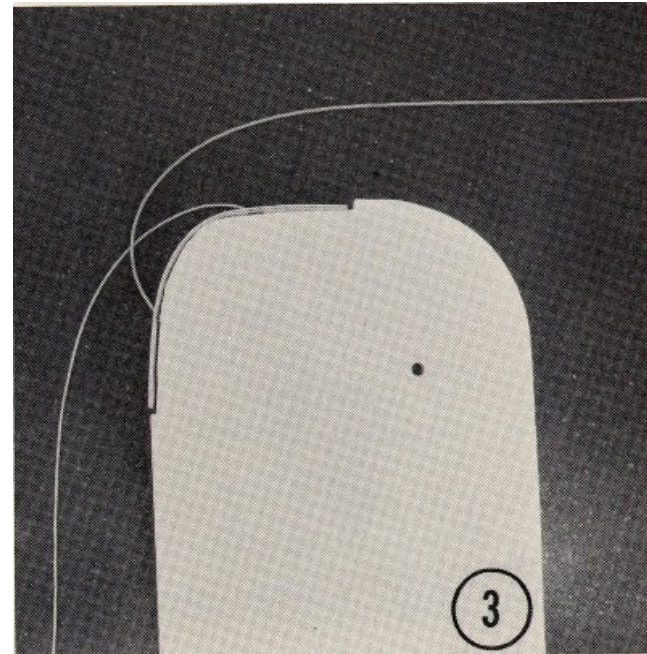
We first sought to secure the control wires to the board in a manner that the wires could be detached from the board and the blade removed from the hull for servicing. A recess (Fig. 1) was cut into the board to accommodate a bent-to-contour 12-inch piece of stainless track, whose fastener holes were natural orifices through which the two stainless flexible control wires (forward:



1/8", aft; 3/32") were led (Fig. 2). Holes (3/8") were countersunk in the board under each wire hole to accommodate the dead-ended wire sleeves (Fig. 3). The track groove formed a natural guide for the control wires during operation (Fig. 4). All stresses were shearing forces on the two stainless screws located at either end of the track. A 3/16" (1/2" long) aluminum pop-rivet in the center hole of the stainless track can act as an additional shearing fastener without crowding the track groove. After leading the 1/8" wire through the fore fairlead and the 3/32" wire through the aft centerboard pennant, the board was remounted in the slot with a small amount of lithium grease on the main bolt and Teflon bearing. The rubber gaskets were resealed with white silicone bathtub caulk.

The forward 1/8" wire was measured with the board in the vertical position and the single bullet block was swaged into place. The forward control line was dead-ended in an eye strap, back through the wire single block, forward to the fixed single block, back through the Delrin bulkhead fairlead, and back to a cam cleat with closed fairlead, the latter mounted in place of the single cleat on the starboard side of the trunk.

The aft 3/32" wire was measured with the board full up and the single bullet block was swaged on. The block was secured with shock cord into the tension system mounted under the thwart (Fig. 5). The tension system uses 1/4" or 5/16" shock cord lead through the four 1/4" cheek bullet blocks and secured with 1/4" clam cleats (Fig. 6).



The above system can offer the following advantages:

- 1) single line control of board positioning rather than dual lines pulling in opposition;
- 2) in case the board hits an underwater object, it is free to give, yet automatically swing back to its pre-set position when free;
- 3) when on a broad reach or run with the board up and approaching the leeward mark, the control line can simply be released and the board will automatically drop to its vertical beating position;
- 4) the board can be completely separated from the hull for servicing by removal of the main bolt and two stainless screws;
- 5) the control wire greater purchase angles improve positive board control;
- 6) the stainless track lowers wear on the fiberglass board and provides a groove guiding the wires into a non-jamming position
- 7) both lines remain taut and in the track; and
- 8) if capsize occurs the shock cord tension will hold the board out of the trunk to make for easier righting of the craft.

Our experience with this arrangement has shown it to be a smooth operating system and much improved over the original design.

