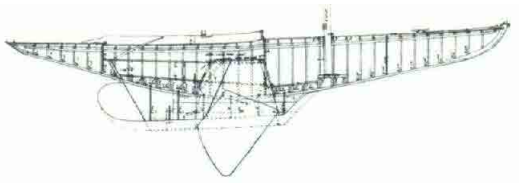


Replacing a **Keel and Centerboard Trunk**

New life for a Buzzards Bay 15-class sloop

by Maynard Bray

Photographs by Benjamin Mendlowitz

MARIBEE, one of the well-known Buzzards Bay 15s, carries Herreshoff hull number 731. The class name comes from the waterline length (overall length of hull is 24'6") and from the body of water for which the first batch of boats was intended. Built in 1914, MARIBEE is owned by Steve Ballentine, in whose Cataumet, Massachusetts, boatyard the repair was carried out. What follows is the story of making and installing a new keel and centerboard trunk, based on photographs taken back in 1981.

Although no rot had softened MARIBEE's keel timber, that vital piece of oak had developed splits all along its 22' length—full-thickness splits that leaked, including a large one right down the middle, and were virtually impossible to make tight. A new keel timber seemed the most logical approach, and since a good piece of longleaf yellow pine of sufficient length was available, that substitution was made with the knowledge that there'd be less checking and splitting than with oak.

Removing the old keel in one piece so its shape could be duplicated became the first challenge. After unbolting and removing the lead ballast keel, the rudder, the centerboard trunk, the maststep, and the external deadwood, boatbuilder Bob Williams unbolted the keel timber, sawed away the other fastenings he couldn't otherwise remove, and dropped away the damaged keel timber itself. For access to the backbone area, Williams had also removed both garboards and a broadstrake—very carefully, so they could be reused. MARIBEE's frames and floor timbers were judged to be all right, as were the copper rivets connecting them.

THE NEW KEEL

1 A wooden cradle supports MARIBEE's hull during the early stages and until the new keel is in place. In addition, two shores from the shop's overhead, temporarily screwed to floor timbers in the cockpit abaft the centerboard slot, help prevent the hull from distorting. Here, next to the boat, the new keel has been steam-bent to shape and clamped over a form. It was planed to a uniform 13/8" thickness beforehand and to the correct width as well—narrow where it will join the stem and transom, and about 10" wide in the middle where the centerboard trunk will land. The bending form consists of a sawhorse that has been padded and extended to duplicate the old keel's curved shape.

2 This view from the inside, taken just before the old keel was pulled out, shows the 13⁄8" centerboard slot and the brass straps that connect the frame ends to the keel.

3 Continuous guidelines lor cutting the rabbet are marked by running this stepped block of wood and a pencil along the new keel's edges, as Bob Williams is doing here. He'll also mark a line on both edges of the keel about an inch down from the top, to be used in fine-tuning the rabbet after the new keel has been fastened to the hull.

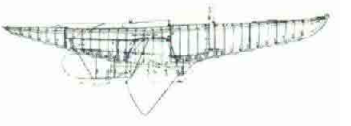
4 Guided by the lines marked on the keels upper surface in the previous step, Bob begins to saw out the rabbet by cutting a little outside of the line and to a depth that is sufficiently shallow for later finishing with a hand rabbet plane. Notice that this work lakes place while the bending jig still supports the new keel. (Since there is no curve in the forward and after thirds of the keel, these ends are allowed to overhang the bending form.)

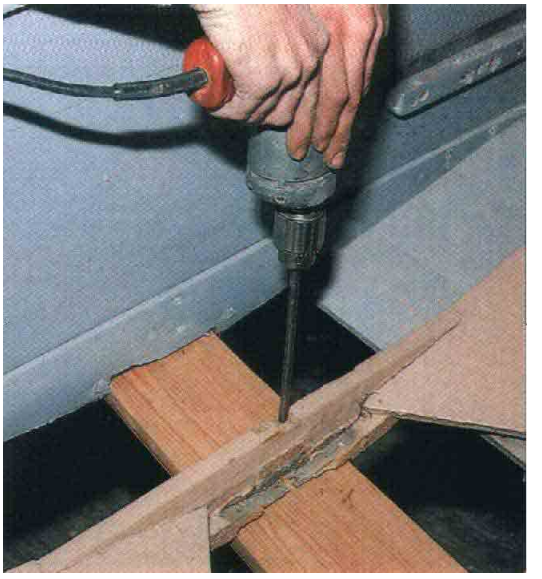
5 A big, heavy, and very sharp slick peels away waste wood and makes quick work of paring down the roughed-out rabbet.

6 Rough-cutting of the rabbet continues. The tapering keel width shows here at the forward end of the new timber.

7 At the new keel's after end, Bob marks for a cut that will duplicate the old...

8 ...and cleans up his saw marks with a scraper so that this surface can land in close contact with the inner face of the transom. The new keel's forward end is similarly cut to marry with the stem, to which it will be bolted.





9 After all the old bolt holes have been cleared of broken-off bolts, and the undersides of the floor timbers have been scraped clean, the new keel is set in place and shored there while new holes are bored through it from above using the old floor timber bolt holes as guides. Then Bob will move under the boat and run shallow counterbores upward for the heads of the bolts.

10 New bronze carriage bolts, driven upward, fasten the keel firmly to each floor timber. A ring of caulking cotton under each bolt head will keep out the water.

11 After the new keel is permanently attached, comes the tedious task of planing the rabbets (using the frame heels and floor timbers as guides) so that the garboard planks will lie fair against them. Because reuse of the old garboards is planned, the new keel has been given slightly shallower rabbets, and therefore more exposed width across its underside, than the old one (see Figure 1).

12 Here, the edge of a garboard that will lie against the new keel has been marked with the new and slightly narrower plank widths and is being planed down to those lines.

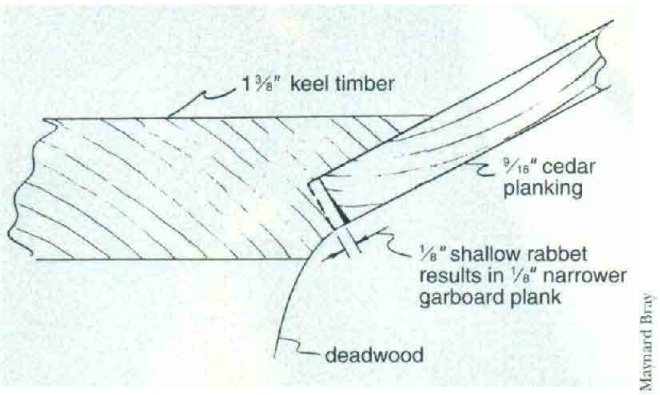
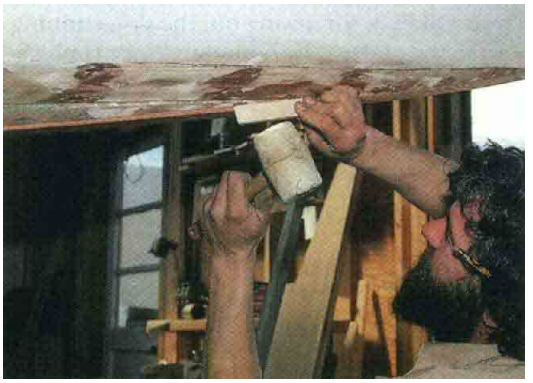


Figure 1. *Typical cross section of hull at the keel and garboard, showing how a shallower rabbet allows the garboard's lower edge to be faired and smoothed.*

13 Because, for this repair, the garboard is the "shutter" plank, some cut-and-try fitting is required. Note that the boat's cradle has been removed and that the hull is now supported by a pair of braced posts under the keel and held upright by jackstands.

14 Accurately fitting a shutter plank is a slow and careful process that consists of marking the areas where the plank binds...

15 ...then taking off a few shavings, and trying it again until there's a good fit, both along the plank's edges and at each end. Notice that the existing screw holes have been filled (with epoxy and microballoons) before the plank is driven home for the final time.



16 Since the garboard plank comes to a sharp and delicate point forward, a softwood block helps distribute the taps of the mallet and protect the cedar plank from damage.

THE CENTERBOARD TRUNK

(To allow better access for measuring and clamping, Steve installed the centerboard trunk before replacing the garboards.)

17 The 1 3/8" bedlogs of oak will be scribed to fit the curve of the keel's top surface. Virtually all Herreshoff-built sailboats having centerboard trunks also have floor timbers crossing the keel in close proximity—one immediately abaft the trunk, and another immediately forward. As the trunk starts leaking with age (as centerboard trunks invariably do), those two floor timbers, as installed, prevent all-around access, so one of the solutions has been to chisel and saw an opening through the interfering floor timber between its pair of keelbolts, as shown in this photograph. That way, the trunk can be caulked from inside the boat where its endposts penetrate the slot in the keel. (This new keel's slot has yet to be cut.)

18 Here the matched pair of bedlogs is being planed square and to the scribed line.

19 Part of the information obtained from the old keel is the bevel at the ends of the centerboard slot, made necessary because of the slant of the endposts. Here, the bevel that has been taken is recorded on a piece of scrap wood so it can be accurately transferred to the new keel.