Making *Magnolia* more seaworthy

How one owner designed and built a sturdy sea hood

by Paul Ring

When finished and fitted, *Magnolia*'s sea hood looked as though it was part of the boat's original design.

Magnolia, my 1970 Cheoy Lee Offshore 27, came from the builder without a sea hood, either as an oversight or a budget decision; probably the latter. A walk on the docks of any marina or yacht club reveals that *Magnolia* was in good company: other boats of the same vintage also lacked sea hoods.

A sea hood has two advantages. First, in brisk weather, a sea hood prevents boarding seas or heavy spray from finding its way under the forward edge of the companionway slide and into the cabin. Second, a sea hood provides an attachment point for the forward edge of a dodger, an item that further contributes to keeping things dry below. In fact, a properly designed dodger allows the companionway slider to remain open in most weather. Because offshore sailing figured in my cruising plans for *Magnolia*, I added a sea hood to the projects list for her refit.

It was natural to think first of building my sea hood by laying up fiberglass in a mold — because that's how fiberglass boats are built. That would be a two-step process: make a mold; mold a sea hood. Then it occurred to me that I could eliminate one step if the mold itself could be the sea hood.

Conforming to curves

I wanted the sea hood to be strong and aesthetically pleasing, and to look as though it came with the boat. *Magnolia*'s cabintop and companionway hatch have the same curvature, and I felt the sea hood should follow suit.

I've seen boats with crowned cabintops and flat companionway hatches or cabintops with one curvature and a hatch with another. Owners of these boats would have to decide whether to make the sea hood follow the curvature of the cabintop or that of the hatch. If, for the sake of simplicity, you are tempted to build a flat sea hood, remember that a flat top must be much more heavily built to have the same strength as a curved one.

When the hatch is open, the hatch slide has to clear the inside of the sea hood, so the critical measurements are the length and width of the hatch and its height above the cabintop at its corners. I found there was a difference in height between the forward and after corners for, while the track was straight, *Magnolia*'s cabintop curved slightly downward at its forward end. I allowed for this difference in my design. These measurements determined the inside dimensions of the sea hood, to which I added ¼ inch for clearance.

Attachment options

During my ruminations about design, I thought about three methods for attaching the sea hood to the cabintop. In the method I eventually used, the sea hood is glued to the cabintop with epoxy and a fillet added between the sea hood and the cabintop for strength and appearance. However, this is the preferred method only if the cabintop and new sea hood are going to be painted as part of the project, which I planned to do. Otherwise, the transition between the painted sea hood and the gelcoated

cabintop at the fillet edge would be obvious and unattractive.

The other two methods I contemplated both offer solutions to the painted sea hood/gelcoated cabintop problem. One forms a sharp angle between the sea hood sides and the cabintop that would disguise the paint line and slight differences in color and gloss because light would strike the two surfaces at different angles. The other employs a flange that makes the sea hood removable.

Assembling the sea hood

I used mahogany for the sides of my sea hood because I had some on hand, but any decent hardwood is suitable. I tapered the side and end pieces from bottom to top at an angle to agree with the slope of the cabin sides. To shape the top and bottom edges of the end piece, I first made a pattern by "spiling" the curve of the cabintop onto a board (see "An old carpenter's trick," page 38). The corners are simple butt joints held together with epoxy, with dowels to hold things in alignment while the epoxy cured.

I laminated the top using two layers of ¼-inch marine plywood. (A third layer could be used if the span is great and/or there is little curvature.) Since a sea hood has only three sides, I needed a temporary aft end in order to make the plywood conform to the desired curvature. I also found that a temporary center beam was necessary to make the plywood conform properly. I attached these temporary components to the sides with small angle brackets so I could easily remove them later.

To ensure the plywood wouldn't stick to the temporary frames, I covered their tops and ends with waxed paper. I glued the first plywood layer to the sides and end piece with epoxy and held it in place with small panhead sheet-metal screws. After the epoxy had cured, I removed the screws. Here's a trick: I heated the heads of a couple of stubborn screws with a soldering iron to melt the surrounding epoxy and make their removal easier.

I attached the second layer of plywood to the first using screws spaced about 3 inches apart. To make sure the top layer would be drawn down tightly to the first, I made sure that the screw holes (pilot holes) in the top layer were large enough so the screw threads didn't bite.

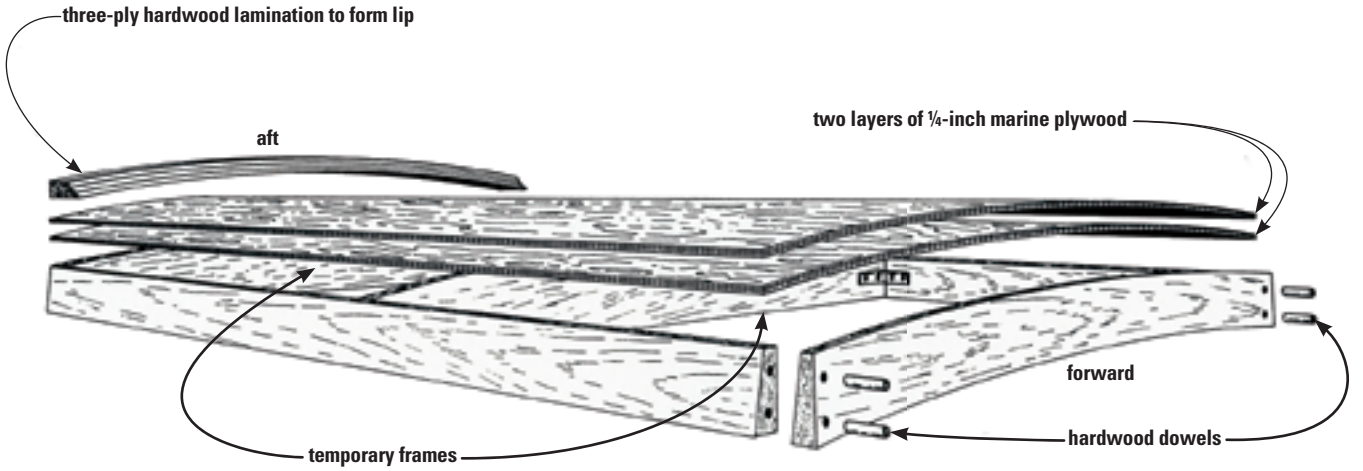
> **"I used mahogany for the sides of my sea hood because I had some on hand, but any decent hardwood is suitable."**

After doing a dry fit, I liberally coated the matching plywood faces with unthickened epoxy and allowed it to soak in for about five minutes. Next, I recoated any dry spots that appeared. I then thickened a batch of epoxy with colloidal silica just enough so it wouldn't run and spread a generous coat on one of the adjoining faces. After aligning the top layer of plywood over the bottom layer, I drove in the screws in the center fore-and-aft row. Alternating from side to side, I then drove screws in rows parallel to the center row, working from the center toward the edges. In this way, the epoxy was squeezed from the top center to the edges without trapping air. I immediately scraped away the squeezed-out epoxy to avoid having to sand it away later.

Filleting the inside corners

After the epoxy cured, I removed the temporary frames so I could finish the inside of the sea hood. First, I applied an epoxy mush fillet along all the inside corners. Since this fillet is structural, I made the mush by thickening the epoxy with microfibers (cotton fibers). After wetting out the corners with unthickened epoxy, I dabbed the mush into place with a Popsicle stick. Then I dragged a tongue depressor, held at a 45-degree angle, along each corner, smoothing the epoxy mush into a uniform fillet. I scraped up the excess mush forced out on either side of the tongue depressor with a second tongue depressor sanded to the shape of a chisel. I did a good cleanup job to avoid the laborious task of sanding cured epoxy later.

When the fillet had cured, I scrubbed it thoroughly with a wet washcloth to remove the amine



Construction of the sea hood is straightforward — it consists of two sides, an end piece, a top, and a lip. The two temporary frames held in place with angle brackets are needed to ensure the plywood layers take up the desired curvature during the lamination process.

ILLUSTRATIONS BY PARUL RING

“Because intuitive engineering told me two were better than one, but a third was unnecessary, I applied two layers of 6-ounce cloth.”

blush while trying to avoid excessively wetting the uncoated parts of the wood. (Amine blush forms on the surface of epoxy as a by-product of the curing process. If not removed, it will inhibit adhesion of additional coatings, such as epoxy, paint, and varnish. Fortunately, it’s water-soluble and easily scrubbed away.)

I then sanded off the gloss and removed any irregularities with 80-grit sandpaper wrapped around a dowel.

Glass for strength

For extra strength, I lined the inside of the sea hood with a layer of 6-ounce fiberglass cloth, which I dry-fitted, cutting slits in the corners to allow the cloth to conform and overlap at the corners. Satisfied with the fit, I wet the cloth out with epoxy resin using a disposable brush. I wet the cloth out thoroughly but was careful not to apply too much resin, since this would cause the cloth to “float away” from the wood.

An old carpenter’s trick

A pattern of the curvature of the cabintop can be made by “spiling” (also called scribing). This is depicted in the photograph by my “hand model,” Gary Moore. For this picture, Gary held a 1 x 4-inch board on edge against the forward edge of the companionway hatch. Then, with the point leg of a pencil compass riding along the cabintop, he scribed the curvature of the cabintop onto the face of the board with the pencil. He was careful to hold the compass so the legs remained vertical during the entire scribe, rather than radiating out from the cabintop. When Gary was finished, I carefully cut along this scribed line with my band saw (a saber saw would work), tested for fit, and made minor adjustments with a rasp.

When the epoxy was partially cured, I trimmed away the overhangs with a sharp utility knife and applied a second coat of resin. (If additional coats of epoxy are applied after previous coats have only partially cured, no amine blush will have yet formed and a full chemical bond between coats will occur. That makes the washing and sanding step described previously unnecessary.)

Reinstalling the frames

After the epoxy had fully cured, I reinstalled the temporary frames because the laminated top had sprung back somewhat at the open end. Of course, I had to trim the frames to allow for the corner fillets. Next, I trimmed the plywood top until it was flush with the sides and rounded all the outside corners using a sharp block plane followed by sandpaper wrapped around a block of wood, the idea being to create a shape that complimented the style of the cabin. I then filled all the screw holes made during the laminating process with a putty of epoxy and microballoons. After the putty had cured, I sanded it flush with the plywood surface.

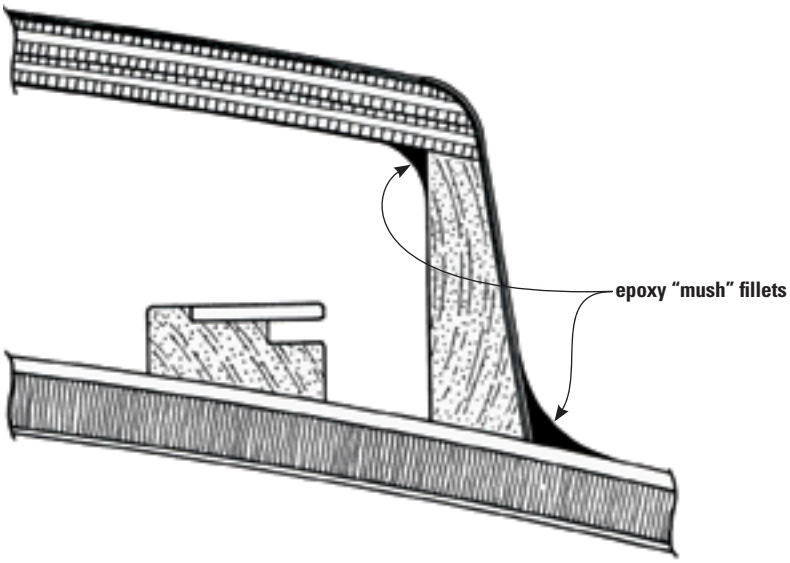
Because intuitive engineering told me two were better than one, but a third was unnecessary, I applied two layers of 6-ounce cloth. I applied these in one continuous operation, trimming away the excess cloth when the resin had partially cured. I followed this with an additional coat of resin to fill the weave of the cloth. As before, I cut the cloth at the corners so it would drape smoothly. After an overnight cure, I sanded the outside of the sea hood to remove any lumps and bumps. I filled low spots with epoxy putty made with microballoons. After this had cured, I sanded it to a smooth, fair finish.

Finishing details

My cabintop is lower forward than aft, which meant that water would become trapped under the forward end of the sea hood. To prevent that, I drilled ⅜-inch limber holes in each forward corner of the sea hood at the bottom edge. In order to control the location of the hole exactly, I drilled a guide hole in a wood scrap and clamped the scrap to the sea hood side with the guide hole in the exact position I wanted. Then, to maintain a seal on the wood, I carefully coated the limber holes with epoxy.

I wanted a lip on the aft top edge of my sea hood for two reasons: it would give me a place to attach a dodger and it would strengthen the otherwise unsupported aft edge. Oh, and for one more reason: I felt it would look good.

I made my lip by laminating three ¼-inch layers to the top of the aft edge. Laminating in three layers rather than bending a single piece of wood to the sea hood would help to maintain the curvature in the sea hood top and be stronger. To give the lip an attractive shape, I made the top layer narrower than the second and the second narrower than the bottom. I beveled the forward edge of each



The cross section drawing, at left above, shows how Paul envisioned the construction elements of his sea hood. The photo, above, shows the finished product. For the sake of appearance, Paul shaped the ends of the lip on his sea hood to form an ogee (an S-shaped curve). Also visible are the ¼-inch clearance between the hatch and the sea hood, the tapered shape of the side, and the fillet between the sides of the sea hood and the cabintop that make them look all of a piece.

layer 45 degrees, so that the three layers formed a continuous slope when stacked. To make assembly easier, I dry-fitted the layers to the sea hood and screwed them in place so they couldn't slip and slide around. I then disassembled them, applied epoxy to the adjoining surfaces, and screwed them back in place. After the epoxy had cured, I removed the screws, filled the screw holes with epoxy putty, and sanded the lip to shape. I formed an ogee shape (an S-shaped curve) at the ends of the lip and sanded a shallow cove in the taper where the forward edge joins the sea hood top, using a dowel wrapped in sandpaper. I slightly rounded all other edges, then sealed the lip and after edges of the sea hood with three coats of epoxy.

Next, I removed the temporary frames and sealed the screw holes with epoxy. I noticed there was a little "spring-back" in the after edge of the sea hood. To restore the proper shape for attachment to the cabintop, I cut away enough of the aft temporary frame to allow it to be C-clamped back in place during the mounting process.

Fitting the sea hood in place

First, I thoroughly sanded the cabintop where the sea hood would be attached. I then carefully set the sea hood in its proper position on the cabintop and, at the corners, drew location lines on the cabintop. Next, I turned the sea hood upside down and coated the entire bottom edge, as well as the cabintop where the sea hood would join it, with unthickened epoxy.

I made an epoxy mush by adding colloidal silica to my remaining epoxy and applied it to the bottom edge of the sea hood. I was careful to use enough for a continuous seal but not so much that an excessive amount would squeeze out on the inside edge where it could not be cleaned away. I set the sea hood in place, guided by the location lines on the cabintop, and weighed it down by placing a bucket of water on top. I cleaned away the epoxy that squeezed out along the inside edge of the sea hood as far as I could reach by using a tongue depressor shaped like a chisel.

On the outside, I added additional epoxy thickened with microfibers (for strength) to form a fillet between the sea hood side and the cabintop. To shape the fillet, I dragged a short piece of PVC pipe through the epoxy mush and cleaned up the squeezed-out excess with my tongue depressor. To protect the limber holes, I inserted a ¼-inch dowel which I had rolled up in waxed paper. It was a little bit difficult to form the fillet around the dowel, but I dabbed a little extra mush around it and sanded it to shape later.

When the fillet had cured, I sanded it to remove irregularities. I found some imperfections that needed filling. For these, I mixed a putty of epoxy and microballons which, as well as being easier to sand, also spreads more smoothly. When that had cured, I sanded it with sandpaper wrapped around a piece of PVC pipe. Satisfied with the shape, I then coated it with unthickened epoxy. After this had cured, I sanded it smooth to create a paintable surface. For now, the project was finished awaiting subsequent painting of the entire boat.

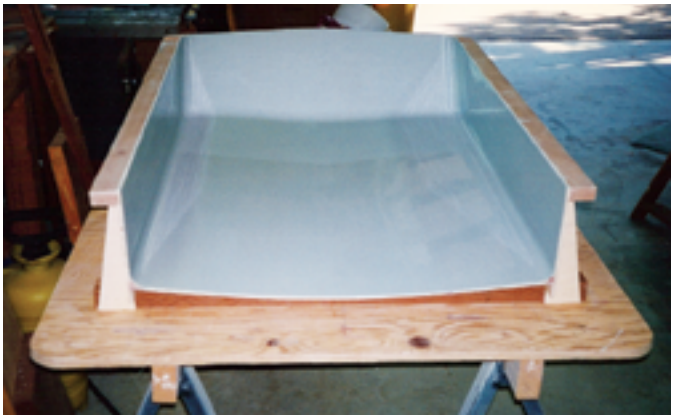
Paul Ring is a contributing editor with Good Old Boat. *He has sailed, repaired, modified, restored, and built boats for the past 42 years.* Magnolia, *his restored Cheoy Lee Offshore 27, graced the cover of Don Casey's book,* This Old Boat. *Paul currently sails his Nonsuch 260 with first mate, Barbara Brown, on Mobile Bay. He has written many how-to articles for sailing publications.*

More online . . . Paul Ring describes alternative methods of attaching the sea hood to the cabintop at <http://www.goodoldboat.com/reader_services/more_online/seahood.php>.

Molding a new sea hood

A venerable Triton gets a valuable upgrade

by Rob Squire



Rob constructed the mold for his sea hood out of wood, at top. After filleting the inside corners and coating the surfaces with filled epoxy, he sanded everything smooth, then applied Brightside polyurethane paint to create a gloss surface that would accept mold release polish, above left. After pulling the sea hood from the mold, Rob attached the rail to the aft end, above right.

One of the enjoyable aspects of owning a good old boat is exercising your creativity to make it it your own. My boat, a 1960 Pearson Triton, had been all but abandoned for five years when I found her. While the old Pearson fiberglass was generally in good shape, she needed nearly everything else. This presented a big challenge. Even my wife, who is used to my shenanigans, just shook her head, convinced that my affinity for the diamond in the rough had finally met its match.

To help get the project rolling, I started looking at boats — from daysailers to ocean cruisers — from a different perspective. I came to the conclusion that most boatowners have their own ideas regarding what's right and proper and what's attractive. My task was to decide which of these views would help me define my direction.

The venerable Pearson Triton is a classically styled boat. I wanted mine to have a "cruisy" feel and, as a part of that, I felt the boat needed a dodger. After looking at a lot of dodgers, I recognized that styling was as important to functionality as to appearance. The Triton is not a large boat and a dodger's size and shape should not distract the eye from the balance of the original design. At the same time, it should successfully deflect spray and keep the cockpit dry.

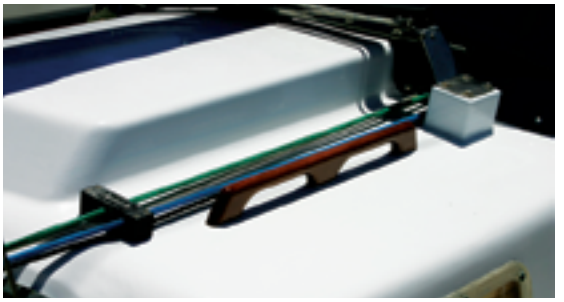
The Triton's companionway slide was designed to open along the cabintop. I decided that a sea hood over the slide would provide a structure on which to mount the forward edge of the dodger. Properly designed, it would add to the finished look and it would also assist in providing a reasonable seal from the weather. Since no such unit was available commercially, I set out to make one.

Harmonizing the design

As with the dodger, I felt the design of the sea hood should add balance to the overall appearance of the boat and harmonize with the curves and angles already there. I wanted the finished project to look as if it had been molded in place as part of the original design for the Triton that had come from Carl Alberg's pen.

Constructing the sea hood in fiberglass seemed to allow the most flexibility in its design without adding unneeded bulk. To achieve the result I had in mind, it was going to have to be molded.

I hadn't planned to build a mold and didn't know how or where to start. I sketched what I thought the final sea hood should look like and, with a scrap of ¾-inch plywood as a base, some ¼-inch birch ply, and a few blocks of scrap, I began building a mold: the sea hood in reverse.



In its final coat of primer, the sea hood awaits installation, far left. Finished and fitted, the sea hood has become part of the Triton's cabintop, near left.

From every angle, the sea hood blends into the boat's original lines. Its crown follows that of the cabintop, far left, and its forward face follows the slope of the step in the cabin, near left.

I filleted the inside corners using epoxy mixed with sandable filler, shaping the fillets with a piece of an old windsurfer mast to create a uniform inside radius throughout the mold. I sealed the pores in the wood with more epoxy-and-filler mix and sanded this to a smooth finish. Finally, I painted the inside of the mold with Brightside one-part polyurethane to give it a clean, shiny, waxable surface.

Before attempting to make the sea hood itself, I molded a proof-of-concept prototype that I could try on the boat, trim to fit, and use to further define the finished product. I laid a couple of layers of lightweight cloth in the mold and set them with epoxy. Then, it was out to the boat to see if all my planning and work were right. A little trimming established the final height, after which I carried the prototype back to the garage where I marked the mold for the final size.

I recalled from the story of the Pearsons' development of the Triton that laying fiberglass in alternate layers of mat and roving was stronger. Since I wasn't savvy enough to know the minimum number of layers, I figured "several" ought to be enough. At around nine layers, the sea hood was near ⅛ inch in thickness and I figured that to be about right to support my weight with minimal deflection.

After removing the sea hood from the mold, I layered in strips in the back of the mold to mimic the aft edge of the hood. I used the strips to create a jig on which to form an aft rail to stiffen the opening of the sea hood and to provide a point of attachment for the dodger. I formed the aft rail by cold molding it with very thin strips of wood that I coated with epoxy and clamped over the jig. After sculpting, filling, and sanding it, I attached the rail to the hood, then used more epoxy and sandable filler to refine its appearance.

Mounting the hood to the cabintop so it looked as if it had been there all along meant making it permanent. This was a notion I initially had some difficulty with, but I couldn't otherwise accomplish the look I'd envisioned at the outset.

I mounted a couple of parallel strips to the cabintop, just outside the companionway slide, slid the hood down over the strips, and glued and screwed it in place. I then filleted the joint, using the windsurfer mast again to make all the rounded edges consistent. All that was left to do was to give the sea hood a final sanding and paint it.

In the end, this sea hood does what I set out to do on the broader scale. The dodger attaches to the rail and water stays out. Whether it's artful, who knows? But I remember Don Casey talking about boats and saying something like, "When you leave the dock at the end of the day and you steal a glance back at your boat, it should make your heart skip a beat."

So far, I'm still getting that feeling.

Rob Squire loves classic boats and old cars. He has been sailing for 25 years on San Francisco Bay and the California Delta and, while he enjoys some racing, he is a cruiser at heart with a special affection for pocket cruisers. When not tinkering on his Triton, he makes a living flying for American Airlines on its worldwide network.