Cabin Sides
(2010)

4/28/2010:

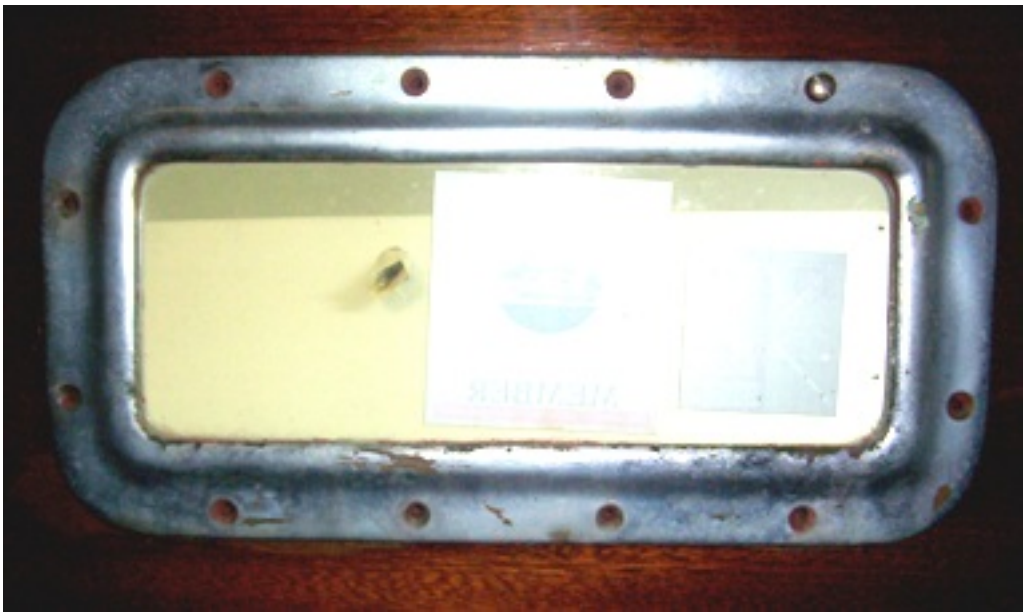
The cabin sides were exposed to the weather for some time without a protective finish. This resulted in excessive shrinkage and eventually large checks appeared.


Memory DUAL

The front and back panels of the cabin are also badly checked.

I could fill the cracks with epoxy and then paint (probably the most practical approach), but I'm rather fond of varnished cabin sides (at least fond of the look not the work). I've considered covering the sides with a veneer; however, a veneer thick enough to last would make the cabin sides proud of the port lights. I've also thought about replacing the sides either with solid Mahogany or Mahogany over a plywood core. Price and availabilty are problems with this approach. I originally thought that repairing the cabin sides was not an option; however, recent feedback from the WoodenBoat Forum has given me hope (thanks Bob Smalser). To do the job right, I need to remove the cabin sides.

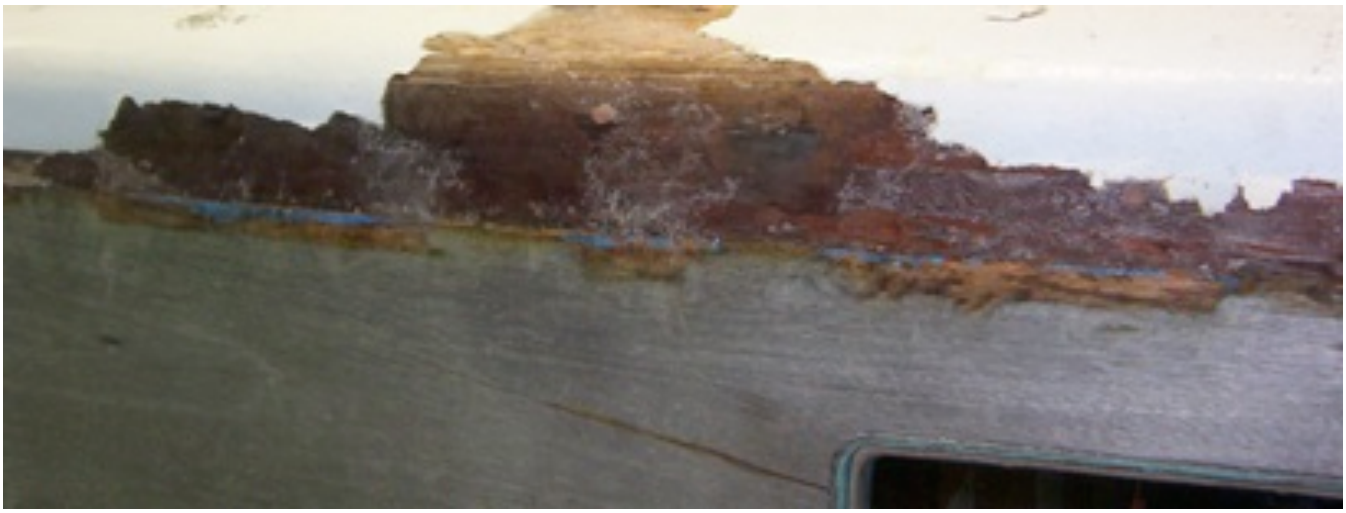
To start, I have to remove the portlights. This took some doing, but I finally found a system that works well. The port light consists of a heavy frame that mounts on the inside of the cabin side. This is bedded and attached to the cabin side with bronze wood screws.



The glass mounts in this frame from the outside and is held in place with an oval frame that is bedded and attached to the heavy frame with machine screws.

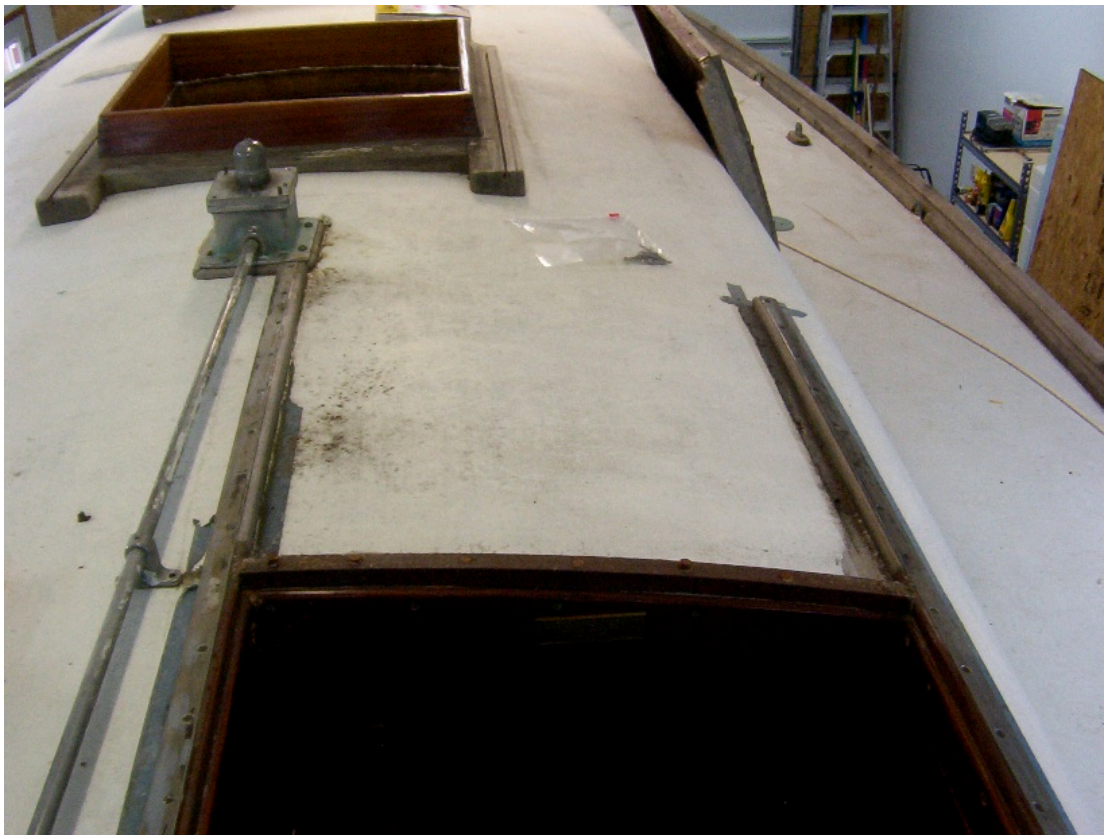
To remove the portlight, first remove the machine screws holding the oval frame. Then gently pry the frame free with a putty knife pushed between the glass and the frame. Once the oval frame is free, remove any bedding material at the edges of the glass and gently push the glass out from the inside. Now remove the screws from the heavy frame and use the clamping arrangement shown below to press the frame out. This works because the rim of the heavy frame stands proud of the cabin side by about .25". This is just enough to break the frame loose from the bedding compound. Note that the bedding was the original brown oily stuff, not the modern white sealant. I don't know that I would have been able to remove them otherwise.

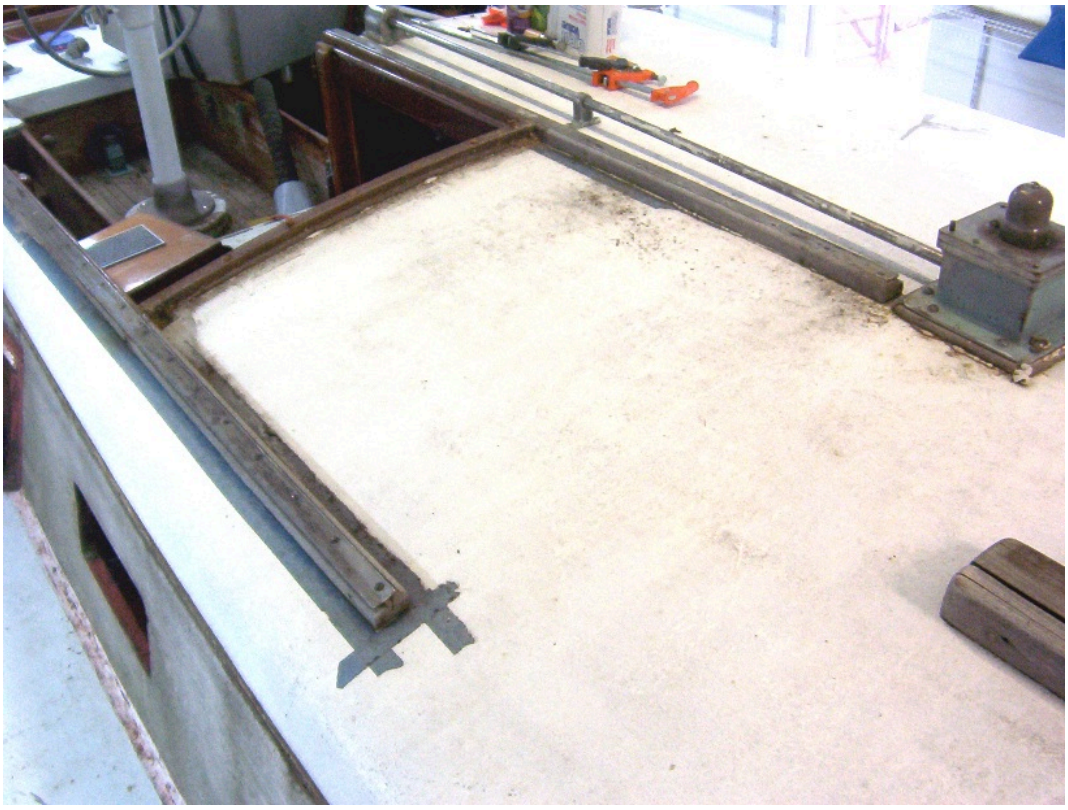
With the portlights out, it's time to deal with the cabin top. It will have to be removed to get at the sides. The plywood top is screwed and glued to the cabin beams and the trunk. To get at the screws, I need to remove the sheathing material (Dynel or glass?). The sheathing covering the cabin top was recently replaced, but as you can see in this pic it is already delaminating in spots. So I don't feel too bad about removing it.



The difficulty is in removing all the fixtures that are attached to the cabin top - three hatches, cowlings, centerboard hoist, etc. They are bedded in some type of adhesive caulk (Boatlife, 3M4200/5200?).

Here are some pics of the cabin top.





First job is to remove the forward hatch, which took some doing, due top the tenacious sealant used to bed the hatch to the cabin top. Here are some tools that I used for the job.

What seemed to work best was to use the Fein Multimaster to remove the caulking from the outside perimeter, just enough to get a pry-bar under a corner. Then lift gently until you can get the Japanese pull saw under the corner. The saw has course teeth with no set, is very flexible, and cuts on the pull stroke (very important because of binding). This combination tends to remove the caulking without cutting much wood. Saw a little, pry a little more - a bit more with the Fein and then the saw again. After a day or so out it comes. I almost forgot about the eight 1/4" studs holding it down! Well you remember them when you hit them with the pull saw! The Fein can cut them, but the bronze if very hard on the (expensive) Fein blades. A hacksaw blade works better.

The Dorades are next. Again a lot of bedding, but the same technique worked here.

After removing all the hatches and fittings, it's time for the sheathing. Here the best technique was a heat gun and scrapper - a week's worth. And then the screws - about a hundred! For this I used a Dremel tool with a small router bit to remove the epoxy filler covering the screw heads. Clear the screw slots and back them out with a power drill - a least most of them came out that way. A few had heads too corroded to remove, so I used a small hole saw to free them from the beam below.

The cabin top is glued as well as screwed, so it took some work to remove it. Here are some of the tools of the trade. The long bar on the right was used as a long chisel to separate the top from the beams.

Finally the top gone.

Before attempting to remove the cabin sides, I thought that I'd test the waters by removing the aft cabin panel first. The problem is dealing with the long bronze bolts that fasten the panel to the carlin. These are 3/8" bolts that enter near the top edge of the panel and extend through the carlin. The bolts cannot be removed from the panel, so it's either cut them at the panel-carlin interface or pry the panel away from the carlin. Since I plan to reuse the cabin sides, I need to preserve the bolts. If not, I'd have to drill for new bolts, weakening the panel. Also replacement bolts would have to be custom made from bronze rod.

So here goes ... First remove all the wood screws. Next separate the panel from the deck sheathing. The deck is sheathed with about 10 oz fiberglass. The sheathing extends up the side of the panel about 1". I use the Fein Multitasker with a bi-metal blade to cut the glass. Works great! Then remove the nuts from the bolts and pry the panel upwards. You can see the two bolts in the

picture, one just to the right of the two big holes. Both the head of the bolt and where the bolt enters the carlin are visible.

Removal was complicated by the fact that the port cabin post was canted inward (towards the centerline of the boat), so the panel bound up after a few inches of prying. This was not a problem during installation because the bolts would have been driven through the panel after it was in place. In this case, I had to force things a bit, but I plan to replace the wood in this area anyway.

Ok, so I'm optimistic - on to the cabin sides. I began by separating the beam ledge from the starboard cabin side. I hoped that the beams would be attached to the ledge and allow me to remove the cabin side without removing the cabin beams. As this pic shows, things are looking good thus far.

As we see here, the typical beam is screwed into the ledge (no glue) and comes away with the ledge when the ledge separates from the cabin side.

Unfortunately, some of the beams (the heavy beams) are dovetailed into the ledge and cabin side.

If this were the only problem, I might be able to lift the beam/ledge assembly away from the cabin sides; however, the screws in some of the beams actually fasten to the side instead of the ledge. So, I'm forced to remove the beams.

As you can see in this pic, some of the beams simply mortise into the ledge (no dovetail). These beams are constructed from a very light wood, maybe Spanish Cedar (to save weight?). The heavier beams in the way of the hatches and mast partners are Mahogany (I guess) and dovetailed.

Removing the beams is no simple matter. The screws are countersunk very deeply with only a small clearance hole for the screw head. Also some of the glue (Resorcinol?) from the cabin top filled the screw holes. So I'm force to drill a fairly large hole to get at the screw. The screws are long and difficult to remove. Even with the screws removed, some of the mortices are so tight that the beams won't budge. I'm in awe at the quality of workmanship in this boat. Everything is a dead fit!

I can't help but wonder, however, what's going on in these joints with the potentially large swings in moisture content. The beams will expand and contract across the grain but the mortices won't change much (with the grain). I guess the Mahongany is strong enough to take any swelling from the cedar beams, but what about the Mahongany beams? I guess it would be better, with today's adhesives, to coat the beams in epoxy to provide better dimensional stability?

This pic shows the beams around the companionway removed.

The beams were sawn to shape and consequetly the grain runs out making them somewhat weak. I ended up splitting a few of the cedar beams getting the top off. I'm considering replacing these solid beams with laminated beams. When am I going to finish this project?????

6/7/2010:

As this pic shows, I've remove all of the beams aft of the head. The rest of the beams are fastened to the ledge (no dovetails), so I don't need to remove them to remove the cabin side.

Using small and large pry bars, I'm able to slooowly lift the cabin side away from the deck. I was a bit concerned that the force from the pry bars will crush the deck, but it seems to be ok.

I'm thankful that the builder installed the cabin side bolts perpendicular to the edge. If they were inserted at an angle, I'd never be able to pry the cabin side loose. Working a little at a time from end to end, it finally yields. Although this plank is 1" thick, it's quite flexible over it's 16' length, so I doubt that steaming was need to bend the cabin side into place. Of course I might have a different opinion when I try to reinstall it! Note that the aft cabin corner post (at the far end) is still attached to the side.

The pic above shows the cabin post removed. This turned out to be a tough job. Evidently, the posts were glued to the sides. The glue on the two front post must have deteriorated, because they came away fairly easily. Not so with this post. I had to hammer a putty knife into the joint to free it. This resulted in some damage to the side, but I don't think it will pose a problem.

The next step is to try to repair the side. Following Bob Smalser's advice, I plan to strip the finish, clean and treat the surface with oxalic acid, fill the cracks with colored epoxy, apply some finish and see what it looks like. If all goes well, I'll do the same to the port side. Otherwise, I'll either replace the side as original or with a panel that has a plywood core and mahogany veneer on both sides.

6/18/2010

Materials for repairing the cabin sides arrived this week. I started to work on the cabin front, a piece that I plan to replace, to see how it goes. Here is a pic of the cabin front as it appeared on the boat.

A look at the inside after it was removed.

Now the inside after it was stripped (heat gun and scraper - very fast). Photo taken in garage - mostly natural light through windows.

... and sanded (this pic now in natural light outside)

The outside is in much worse shape, so I'll bleach it. First I scraped and planed away the residual adhesive, etc. from the piece. Then I cleaned it (outside) with a mild dishwashing soap, rinsed with hose, followed by a rinse with distilled water. Actually, I used dehumidifier water that I've been collecting. But I noticed some debris in the bottom of the tank when I went to use it. Don't know where it could come from, but I guess I should use real distilled water for the good piece. Let it dry, then brought it inside to bleach it. Used 8oz of hot dehumidifier water to 2 oz of oxalic acid. Applied a little at a time and scrubbed with a brush. 8oz was about the right amount for the cabin front. Scrubbing produced some brown residue (didn't really scrub that hard). Let it sit over night.

I also cut some blocks for squeezing the cracks closed. Works ok on some, but most of the cracks don't squeeze closed.

6/19/2010

Today I rinsed the oxalic acid residue off the cabin front. Looks pretty good wet – nice Mahogany dark brown. After it dried, it turned pretty white. Don't know that I could tell much difference from when I started. I could see a few spots where the bleach didn't take. I think the piece wasn't completely dry when I added the bleach (in the cracks). Maybe the wetness kept the bleach from getting to the wood. I let it dry completely this time and applied bleach again. We'll see what it looks like tomorrow. In addition to the bigger cracks, there are numerous smaller surface checks. It almost seems that a filler will be required. I'll try w/o first.

7/8/2010

I've treated the outside of the cabin front twice with oxalic acid. Turned very white.

I then scraped (too slow) and sanded the surface until the white was mostly gone. Started with very course grit (80?) up to 220.

Note that one of the bronze rods is beginning to show through (lower left). This piece has been sanded many times over its life. As you can see in the lower right of the pic, some of the bleached white wood remains. What happens is that most (if not all) of the wood in contact with the bleach turns white. Since H. Mahog has open grain, some of the whitening occurs below the surface. This can be eliminated if you remove enough wood; however, this piece was subjected to severe weathering and thus exhibits numerous very small checks which extend deep into the wood. This cannot be removed by reasonable sanding. Thus, it seems that if bleach is used staining is a must.

I bought two mahogany stains; one from General and the other Varathane. The General is much more red out of the can than the Varathane, which is much more brown; however, they appear similar when applied to the bare wood.

This is a sample of the General stain applied to the inside surface.

… and this is the Varathane.

Note that both stains darken the wood considerably. I tried some pre-stain wood conditioner to try to limit the darkness, but the conditioner, being oil based, darkened the wood by itself. In this pic of the outside surface, there are five regions with different stain combinations (upper right and left about equal size; lower right same size as upper right, small region in lower center, and a little bigger region in the lower left). Wish I had Photoshop to make this clearer!

The region in the upper right was treated with just conditioner. In a further attempt to limit the darkness of the staining, I tried using a paste filler colored with some stain. The region in the upper left was a mix of about 12g of filler, 6g of mineral spirits and a few drops of General stain. The region on the bottom right is a combination of 7g filler, 3g mineral spirits, and 16 drops of Varathane. Note that although both of these regions are lighter, the white streaks from bleaching remain. It appears that the thinned filler doesn't fill the cracks adequately. I also tried unthinned filler (7g) and 10 drops of Varathane (lower region center), and 12g filler, 32 drops Varathane, 2 drops General (lower region left). The lower region center still has white streaks. The lower left region is the best thus far. In all of these experiments, it seems that the stain leeches out of the filler and darkens the wood. Consequently, I tried to apply plain filler first and then stain over (new region in lower left in the following pic), however, the dried filler did not accept much stain, so again white streaks appear – this time due to the light-colored filler. I

also tried applying filler over the previously conditioned wood, followed by stain (upper right), but this was also streaky.
Not sure why the two previous pics are different shades - just different camera exposures, I guess.

Thus far the best result was the combination of filler, Varathane, and a little General applied to the bare wood. So I decided to try filling one of the larger checks and color match it to my stain. So the theory is to use red and brown dyes to color the epoxy to the same color as the finished wood. So I took my best shot at matching the filler/Varathane/General combo that I liked. First fill the crack with colored epoxy (surrounding wood just bleached and sanded - no stain) - see below.

I started with West System 105/206 (slow hardener) and used a syringe to fill the crack. I taped the back side to limit the leak through. I let it soak in for a few minutes under a heat lamp, thickened the remaining epoxy with Cabosil, and finished the job. When the epoxy reached a partial cure (green state), I removed the excess with a cabinet scraper. Except for a few air

pockets, it worked ok. I could go back and fill these with some more epoxy, but not for this trial run. After the epoxy fully cured, I applied my filler/stain combo.

It sure came out darker than I'd hoped. Consequently the color match isn't quite right. So let's try again. This time I tried for a darker/browner epoxy mix. Region to the right was a previous stain sample. The region around the crack was just bleached and sanded. The wood plug seen in the pic was used just to limit the epoxy leakage.

Now applying the filler/stain ...

Again the filled crack is lighter than the stain. What I'm beginning to realize is that the darkness of the stain depends a lot on how hard I rub the filler. If I rub too much, however, I drag the filler out of the cracks.

This problem remains unresolved. I'm going to try a couple of things in the future

- Epoxy over the entire surface first and then fill the cracks with filled epoxy colored to match the rest of the wood.
- Just varnish w/o filler.
- No bleaching - just sanding - which might limit the whitening in the cracks.

- A latex based filler which I will color to match the wood. Hopefully this will eliminated the problem of the oil in the filler from staining the wood.
- I bought some black colorant to see if I can make the epoxy crack-filler darker. I think that dark lines would not be as noticable as the lighter ones.