

Seabreeze Centerboards

by Roy Harvey, #127 *Aeolus*

Our 60's vintage boats have a heritage that goes back to earlier successful ocean racers that were designed to "beat" racing rules of the day and also provide shoal draft advantages. Finnisterre, Paper Tiger, Nevin's 40's, Bermuda 40's, Block Island 40's and others all had long overhangs, beamy hulls with a hard turn at the bilge, and centerboards, and they all were winning race boats with beautiful lines.

Our boats sail well with the board up but they point much better, going to windward, with the board down...and then have reduced wetted surface going downwind when you crank the board up. Centerboards allow you to slide through shoal water, they also allow you to have some adjustment on weather helm on the boat. With the board down there is a significant amount of board area that adds to the total and point of lateral resistance of the hull...this, with relation to the center of effort of the sail plan is how a boat achieves sailing "balance", just a touch of weather helm. The accepted practice on our boats is to put the board down at a sixty degree angle, this is believed to be the point of balance as designed. That's sixty turns on the winch handle on our boat. With the board down the boat points well going to windward. On a windy day, when the boat starts to develop too much weather helm because you have a little too much main to balance the small headsail, you can raise the board a little and feel the helm ease, this is because you have moved that center of effort aft. Boy, these boards are really worth having aren't they.

Now for the other side of the coin. The first run of Seabreezes, up to Hull number 70 or so, had bronze boards like most of the other CB boats of the time...these boards weigh about three hundred plus pounds and are great, require little maintenance other than periodic cleaning. The next run of boards was made from aluminum, weigh about eighty pounds, and do require special care, particularly considering the age of our boats and the fact that most boats have had multiple owners and different levels of maintenance over the years. Centerboard cables for both boards always demand periodic inspection and possible replacement.

The original lifting system for the bronze board is a stainless steel wire cable from the board, over a turning block, that's in the watertight box in the bilge, and through a red brass tube to a sealed turning block near the port side of the engine, then up to a worm drive winch in the forward port corner of the cockpit. The cable is full length, from the top of the board to the drum on the winch.

The second lifting system came along with the Citation model and aluminum board. There is a 36" cable from the board, over a turning block in the water tight box in the bilge, and fastens to a 55" metal rod that runs inside a 48" long metal tube bolted and sealed to the aft end of the water tight box. The tube runs under the cabin sole toward the engine...on the aft end of this tube is a stuffing box, the rod exits here and fastens to another cable that runs to the worm drive winch mounted in the port aft corner of the cockpit . These boats came from Allied with an aluminum board, aluminum turning block, rod, aluminum tube, stuffing box, and stainless steel cable. Both types of boards pivot on a 1" dia. pin accessible inside the pipe screw fitting in the centerboard sump. This pin is usually drilled and tapped for a 5/16" NC female thread so a bolt can be threaded in to help in removal. Both boards should use stainless steel cable for maximum corrosion resistance. Measurements stated are approximate.

The aluminum system does require close scrutiny and possible re-building. Any time you have metals under water, particularly conducting water like brackish or salt, you have to be very careful in mixing different metals. You can get serious electrolytic corrosion. As near similar metals as possible will help minimize this problem. With the aluminum board you should provide non-conducting bushings through the board where you have stainless pivot pin and stainless fastenings, use 316 alloy fasteners and separate the dissimilar metals. The aluminum board requires an antifouling paint formulated for aluminum. The board, more than likely, also requires some re-surfacing after its many years of immersion. The recommended practice for re-working the board is to have it sand-blasted, any corrosion pitting or irregularities filled and then coated with several coats of epoxy. Needless to say, the aluminum board system requires careful attention to not mix metals. The point of maximum corrosion on the cable is where it flexes over the turning blocks and at the point of waterline on the cable. A rule of thumb with cable over a block is to have at least a 20:1 ratio between sheave and cable diameters...this is to prevent tensile load breaking outer cable strands from too much tension, in other words, going around too tight a curve.

Keep this in mind...larger cable might not really be stronger. Centerboards and their lifting systems should be closely inspected whenever the boat is hauled. The generally best recognized stainless steel type cable is Monel, having about the best corrosion resistance.

It's interesting to note that all the "heritage" boats mentioned in the beginning of this article had different types of lifting systems for their boards. Since most of our boats have had a number of owners there may be minor variations in the lifting systems described as alterations from the original...it's also a fact that an entirely different lifting system appears in a line drawing in this web site...to our knowledge a lifting winch in the main cabin was never installed by Allied.

Why did Allied switch from bronze to aluminum??? Well we'll never really know but here are some of the boat differences that come along with the board change. The original boats had all bronze deck hardware, along with the bronze board. As the transition to aluminum boards came along the deck hardware was changed to Marinium, a hard anodized aluminum. This, plus the change in board weight, took a considerable amount of weight off the boat. Somewhere in here the rudder was changed to the so-called racing rudder, a "trapezoid" shape, used on Citations, rather than the original "oval". The CB winch, in the Citation model, is located close to the steering station rather than at the forward end of the cockpit as in the original design. I believe Allied was probably promoting the boat more for racing and lowering the total weight where they could was a big factor.

The aluminum board system requires more care and maintenance, no question, whether the weight saving is justified when we usually load up lockers with unnecessary stuff is a moot point for many owners. Probably the one saving grace for the aluminum board is that it is the board that comes in the later design Citation model with its much improved interior space and cockpit arrangement. Citations started about Hull # 107. We bought a Citation for this interior design change and learned to live with the aluminum board. Just another trade-off in the boating world.

When we bought our boat, Hull # 127, we had serious corrosion on the aluminum tube and the turning block. We re-built the entire system in 316 alloy stainless, and have not had any more corrosion problem. We have had the board sand-blasted and epoxy coated.

Here are some other changes we've made to our board that have been valuable and will be worth considering on either board.

We use two 18"dia. HDPE (high density polyethylene) discs on each side of the board at the pivot...these act as low friction "washers" and help the board go down more easily. Consider, in a race, you have just rounded the down-wind mark, heading for the finish line hard on the wind and you didn't get the board down soon enough...side "leeway" pressure might hang up the board...with the washers it will go down.

We added two "bumps" on the forward lower corner of the board, these fill up most of the space between the board and the sides of the centerboard slot, this takes away all the board "thump" when the boat rolls back and forth and now you will be able to sleep in that roily anchorage.

If a centerboard cable breaks it is always at the worst possible time and location. We added a small stainless shackle at the forward lower corner of the board. This makes it possible, conditions being favorable, to go overboard with a line and a snap hook and quickly fasten the line to the board for retrieval. Remember, with no cable that board is down seven feet, so a quick fasten is essential.

The HDPE material is available from many plastics suppliers and, along with Monel cable, from McMaster-Carr.

Accompanying is an article on aluminum centerboard cleaning and coating, also some pictures of various points of this article.

REBUILDING AND REPAIRING ALUMINUM CENTERBOARD

STEP #1: REMOVAL OF BOARD

It is easiest to remove the board while the boat is on a lift. This allows working space under the keel to detach the cable and clearance to drop the board. The centerboard pin can be accessed under the cabin sole forward hatch. After unscrewing the pipe cap, withdraw the pin and the board will be hanging only on the cable; the board can then be lowered to the ground by letting out cable. *CAUTION:* Do not allow helpers under the board as the extra strain on the cable may break it.

Alternately, the board may be removed while the boat is docked by following the above procedures plus replacing the pipe cap promptly. After the board is on the bottom of the harbor run a line under the hull to bring up the cable and while continuing to let out cable, pull until the board can be handled. This procedure will save a haulout as the board can be repaired at your leisure and ready for installation the next time the boat is hauled.

A weight or clamp attached to the cable will help prevent it from jumping off the sheaves.

STEP #2; PREPARING THE BOARD

The board will probably be pitted too much to be able to sand it clean. The preferred method and easiest is sandblasting. A search in the yellow pages should find someone to do it for \$50 to \$75.

Wash the board with Gougeon Bros. 860 Aluminum Wash / Etcher.

If the cable attachment point needs to be repaired it may be easiest to relocate the hole slightly inboard by routing a new area for the shackle and drilling a new hole. The old stainless ferrule can be reused. The aluminum is soft enough for a router bottoming bit to work, although you may not want to use the bit on teak afterwards.

STEP#3 RECOATING THE BOARD

All of the materials used in this repair are the **west system** from Gougeon Bros who also print an instruction booklet titled "**fiberglass boat repair & maintenance**".

Materials: 105 resin/205 hardener

410 microlight filler

With the board dry, after the chemical wash; saturate the surfaces with an epoxy mixture. **NOTE:** If you can hang the board on a 3/4 inch pipe you will be able to do both sides at once. In 2 to 3 hours, before the epoxy is cured; apply the first layer of thickened epoxy mixture (peanut butter consistency), this should fill in most of the pits. If the edges of the board are corroded, use a form made by sawing a length of 1/2 inch PVC pipe



This photo shows the water tight box open with the sheave and cable exposed



This photo shows the water tight box and lid, lid not bolted in place...this box and cover have been re-built by the owner to allow using a rubber gasket rather than caulking.