

Technical Pull-Out

Q&A FOR YOUR CATALINA THAT'S BEEN FACTORY APPROVED FOR ACCURACY



Catalina 470 National Association



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Archiving Onward

Articles giving advice to new or future long-term cruisers always feature a statement about how important a role the dinghy plays in the cruising lifestyle. They usually go on to make an analogy to the family SUV or pickup. However, those articles really don't do justice to the whole picture. While I made plans to cruise *Onward* full time, I bought a dinghy and motor and lifted them onto the foredeck between weekend excursions. I did research on davits and installed a set along with braces to the stern rail on both sides of the swim ladder as, like most davits on C470s,

they had their upper mount fastened to the stern rail. These davits and braces did the job well over the three years I prepared to cruise.

Three months into full-time cruising, I replaced the inflatable-bottom dinghy with a RIB and a year later upgraded the 6-hp to a 15-hp outboard as I became fully aware of the realities of dinghy use while cruising. I single-hand *Onward* most of the time and it is imperative for me to keep the outboard mounted on the dinghy, as there is no way for me to be able to attach it safely by myself in anything but calm seas. That is much too restrictive given the need to be able to launch quickly in an emergency.

Extensive coastal cruising and ocean passages add the additional stresses from large, confused seas (or sports-fisher passages) that create a live load on the davits; in these conditions, it is

extremely hard to keep the dinghy stationary laterally. Now, like most things on the C470, Catalina built the stern rail to be quite robust. But, the toll of extensive davit use and live loads resulted in stern rail deformations and weld failures in spite of the braces (8 in all). A switch to heavier tubing (1.25" vs. 1") davits and reconfiguring the mounts to transfer more of the load to the swim step didn't really make much of a difference.

I found myself saying more and more that the one thing I wish I had done differently from the outset was to install an arch instead of davits so the load of the dinghy would be transferred directly to the hull instead of through the stern rail. In February 2013, I spent some time in the Bahamas with Tom and Dana Talkington, on *Healing Time*, C470-78. Tom had recently had a custom arch installed and was really happy with it. Over the

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next few months, I talked with several C470 owners who had arches and they were all very pleased with them.

This convinced me and once I'd made the decision, it became a design question. My principal design considerations were substantial strength to handle the dinghy loads; functionality to mount ancillary equipment; and esthetics to complement the lines of the hull.

Now, on the general topic of arches there are strong opinions as to their esthetics. I am going to handle this issue by citing the old Roman era response: *de gustibus non est disputandum* (to the effect: you can't logically dispute a matter of taste).

I became a student of arch designs and photographed and inspected many. Several C470s have been very pleased with a Wells Marine stainless steel arch design. But cost, the desire for a custom design and the need to fit into *Onward's* movement rhythm ruled this option out. So, this December, I arranged for Harper Fabrication in Jensen Beach, FL, who had built the arch for *Heeling Time*, to custom build an arch for *Onward* using anodized aluminum. The enabled Harper Fabrication build to my design and fit it in with my cruising schedule; the cost was substantially lower (less than half the cost of stainless steel).

I looked at several arch designs that transfer the entire load to the side decks using a cantilevered truss design; some require additional extensions to move the davit falls astern enough for the dinghy to clear the transom. After experiencing a dinghy on davits in a substantial sea, I wanted *Onward's* arch to transfer the dinghy load to the stern with as much of a vertical component as possible instead of as a load cantilevered off the side decks. I also wanted to be able to secure the dinghy to the arch to provide lateral stability and minimize the live load problem.

The design I settled on, in collaboration with Jeremy Harper, consists of three 2.25" O.D. anodized aluminum arch segments that form an integrated arch truss. The legs of the forward arch segment attach to the side deck while the legs of second segment attach with their centers 13" below the stern cleats and 7.5" in from the outer side of the rear face of the transom. This position maintains good access to the stern cleats with little interference with stern lines when docking.

For esthetics, the forward arch segment base is located between the side risers of the stern rail and raked back at the same angle. The height of this seg-

ment is set so its top is approximately 3" aft of and approximately 2" above the aft bow of the bimini. This sets the level of the top of the arch so that one's eye perceives it as a continuation of the line of the bimini top and thus keeps it from appearing as an awkwardly tall appendage.

The third arch segment has shorter legs and is located aft of the two main segments with its top in their plane. This allows the davit falls to be located far enough aft that the dinghy clears the stern. The legs of this aft-most segment attach to the second arch segment opposite to where the lower truss stiffeners join it to the forward segment. This causes the dinghy load to effectively transfer as a more vertical load to the stern and distributes it in part to the forward segment and thence to the side deck.

Rectangular sections (1.25" x 4") are used to tie the three arch segments into an integrated truss. These sections provide good structural strength and sufficient surface area for attachment of ancillary equipment. The lower lateral stiffener is placed to pass just under the stern seats while the upper lateral stiffener is placed high enough not to interfere with use of the stern seats.



A smaller 1.75" O.D. arch segment is located on the interior plane of the second segment to create a stiffening truss. The second segment is slightly narrower than and thus inboard of the forward segment. This adds additional torsional stiffness to the arch.

I had a segmented 1.25" O.D. aluminum tube welded on the interior plane of the first arch segment and beneath the forward center top stiffener. This provides the flexibility to reconfigure cables for various electrical and electronic elements on the arch without having to drill access holes and snake wires.

As *Onward* was departing for the Bahamas soon after the arch fabrication was complete, I chose to use the same rope falls as I used on the davits along with a turning block on the stern rail to lead the running end onto the electric winches to raise the dinghy (this in lieu of surgery for a torn rotator cuff). When *Onward* returns to the US, I will install on top of the arch two dedicated 12-V DC electric winches (used for ATVs) equipped with high tensile strength line instead of stainless steel cable to replace the rope falls (my thanks to John Miller on *Dulcinea*, C470-78, for this idea).

I transferred the mount for *Onward's* three solar panels to the forward arch segment. I also moved the LED stern light and backup VHF antenna to the arch. An LED floodlight for the transom is also suspended there, a real boon when guests are boarding their dinghies at night. I removed all the 1" stainless steel tubing braces and solar panel supports. At Tom Talkington's suggestion, I tied the bimini into the arch and removed the two struts to the stern rail that formerly did this job. The net result was a much cleaner and more open looking stern.

I carry the dinghy slightly above height of the stern rail to give me good visibility to the rear. This also allows the starboard stern tube of the dinghy to nestle into and be secured to the crux formed by the junction of the aft and second arch segments. Along with cross-attached ratchet straps, this provides great lateral stability. *Onward's* folding swim ladder can be deployed with the dinghy in the raised position.

After three months of extensive use, I am absolutely delighted with the arch. I no longer fret about stress on the stern rail when *Onward* has to negotiate confused seas. I see things only getting better as I further exploit the capabilities of arching *Onward*.