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Considering a Small Trimaran?

By Mike Waters

Part II

A designer's expert opinion of what makes for a good tri

Editor's note: In part I of this feature article (*MULTIHULLS* July/August, pg. 42), author Mike Waters defined a small trimaran as those between the lengths of 3.5 meters and 8 meters and discussed considerations such as loading vs. performance tradeoffs, risk of capsizing the smaller trimarans, along with ama buoyancy and hull variations.

Each material used in the construction of a small trimaran has certain pros and cons and if that were not true, we'd see one dominant material always at the forefront. Each buyer should carefully consider what they can live with, relative to their budget.

At the lowest end, we see the polyethylene hulls that are created in roto-molds for mass production. These hulls are resilient, tough and ideally suited for rentals or for kayaks likely to hit rocks at speed. Fancy hull shapes also can be created with polyethylene — almost anything that's needed. However, this material has a soft surface and scuffs up easily, often showing significant wear after just a few seasons. It also deforms easily in the sun, even under its own weight, and it's fairly heavy. With the poor surface and deformation issues, this isn't a particularly fast hull either, definitely making this material a compromise on performance.

For the same cost, you can purchase quality plywood which will be lighter and more rigid. Although you will compromise here on weight somewhat, you can sheath vulnerable surfaces with fiberglass cloth and epoxy and improve life significantly. Surfaces will stay much fairer than with polyethylene and combined with its rigidity, a well-designed plywood boat will be faster, too.

In fact, wood remains one of the best performing materials available, having that fine combination of light weight with rigidity. Round bilge hulls can be planked with strip cedar and after sheathing in glass/epoxy, faired to produce hulls that rival the very best in the latest composites. Check out this amateur-built F25A (right) and you'll see what can be done.

Two specific wood/epoxy boats come to mind as they are *still* winning races after more than 30 years. These are the trimaran *Adagio* and the monohull *Lazy Lady* — two great boats by the Gougeon Brothers, that effectively promote the long life and competitive performance of wood-epoxy systems. Both boats remain very light, very fair and in great condition — don't cross wood off your list too soon!

Subhead

The fact that we have good plywood that can be formed in naturally fair shapes is also a bonus for amateur builders and I continue to use it where it still makes sense.

As a production material, fiberglass is more expensive than polyethylene but if the surface can be kept from frequent contact with sharp rocks, the material can provide better rigidity and a more stable surface that will remain fair, watertight and good looking for many years.

I am still surprised that many people think of fiberglass as being a light weight construction material when in fact it's not. It typically weighs about 2.5 times that of wood and therefore have to be 40% thinner to provide comparable performance — making it too flexible and perhaps fragile. The latest use of this incontestably durable material is in a composite sandwich



with a thin skin of it on each side of a semi-rigid foam. There's no doubt that this can produce a lighter and more rigid panel than even one of plywood, but at what cost? Not only is the production and material cost high but also the thin exterior skin remains fragile against sharp objects.

Core materials also are prone to failure such as delamination and although on paper a solid lightweight core such as end-grain balsa might show the best performance, these core materials have their own trade offs. I've given up using it for any composite requiring even one small hole through it for some fitting or whatever, as it absorbs water too readily and rots. There are now some high performing PVC and semi-rigid plastic foams on the market, though they remain costly.

Carbon fiber is a luxury and still only justified for rudder blades, dagger boards, masts and rather extreme race boats that need to be super light yet incredibly strong. It's a fragile material nevertheless due to the thin walls permitted by its high strength and also quite brittle with very low elasticity before failure — far lower than ordinary glass.

Having said that, it's extremely useful for reinforcing small parts under high loads and in such limited cases, is also acceptably economical to utilize. In fact, all of my own designs use a little in strategically critical areas. For hull use though, there are pros and cons and the 'brittle factor' can affect even boards and masts. I've seen ultra light all-carbon hulls get thrown around in rough conditions while trying to punch to windward, while a heavier glass boat experiences far less problems. Where these designs really excel is when cranked slightly off the wind, but that's not a course you can always plan on.

(See more on material options and methods in the Construction Issue section of Mike's Web site - see below).

Effects of increased size

A larger boat tends to be more capable in large waves and less lively to the helm making it more suitable for cruising, while also offering more storage space. But at the other end, small boats give you the most thrill for your dollar and there's



something deeply satisfying about sailing a small but good-handling trimaran — particularly if you have built it yourself. The sensation of accelerating and moving fast is enhanced by being very close to the water and the high stability makes even the small boats powerful yet enjoyable to sail.

Some early designs were certainly not very good; too much weight and windage made trying to gain ground to windward a disappointment. But with a modern design, that's no longer the case. And if you can also fit a small wing mast, you'll really get to appreciate what good sailing and efficiency is all about. It will remind you of what four-time America's Cup winner Dennis Connor once said after his first ride aboard an efficient multihull: "Wow! What have I been doing all my life not to have discovered this before?"

Make sure you correctly assess what you want to actually do with the boat. I think it's sad to see all of the small multihulls that are laden down with a cabin that is seldom used, when a larger cockpit (with optional tent) would serve the owner far better and be a lighter, faster, less expensive boat as well. For example, a large cockpit not only gives more space for friends but also allows you to sit farther forward and sail far more efficiently going to windward.

A cost/performance analysis might also be made of folding systems. Do you really need the cost, weight and complexity of a system that folds away in a few minutes? Perhaps so if you have to use a marina very often. Those who can find or create a mooring of their own will enjoy a lighter, less expensive and less complex boat that is demountable in a few hours or less and, avoid the wear and tear that marina life typically imposes both on the boat and your nerves!

Dryness

Boats vary considerably in how dry they are. Perhaps this is not important to you if you're young and looking strictly for speed and fun, but when you get older (or wish to encourage and keep a lady friend!), it can be very important. While it's always good to try out a new boat on a rough day just to see how unlivable things are, it's not always possible. Here are some things to look for and what to expect: All things being equal, the smaller the boat, the wetter it can be. Of course, not all things are equal. Faster boats tend to impact wave tops and send the spray flying. However, not all fast boats are wet and neither are all wet boats, fast. If spray is created by the leeward hull, then other than wetting that ama and leeward tramp, it does not wet the crew. Boats that have no main hull knuckle and present a clean line from keel to deck, also tend to be wetter as the water flows freely up and impacts the cross beams (akas) with great force. Since this water is close to the centerline and often to windward, this will indeed throw a wall of spray over the crew.



But if there's a knuckle being used, this seldom happens, especially when combined with an overhanging deck. Just compare a Dragonfly 25/800 with an F25 and you'll soon notice the difference. Both hulls are just over 25' long.

Boats with a cross beam that is too close to the water are also pretty wet so you're better off (regarding the smaller boats) with an aka that rises a little above the ama deck. If the forward face of the beam is flat, then this will also throw up a spray and soak the crew — particularly if too low to the water as is sometimes the case with folding systems. Demountable systems that use waterstays, ideally use oval mast sections laid horizontal and these are quite kind to their crews in terms of inhabiting spray creation.

Launching

Small boats under 20 feet in length are not a big issue regarding launching. Boats over 25ft can be more of a handful and your success will depend a lot on your personal experience, agility, strength and physical condition. Raising the mast on a boat much over 20ft is often the most tricky part and while it can go very smoothly, something like a troublesome winch can make it incredibly stressful. Launching complexity will depend upon the mast weight, complexity of the rigging and how well the rigging set-up controls mast movement.

Although a good folding system (like a Farrier or Dragonfly) generally works very well and is fast to use, a good demountable system is also quite practical as long as the weight of one ama can be handled by 2 persons. With the help of aids like folding trolleys to take the amas, even a 26 footer can be assembled in about 30 minutes, so the time saving with a folding system might not be that significant. The main difference is that the latter is performed in the water, while the demountable versions must be assembled on dry land.

The size of the launching area and ramp becomes a factor when the boat is more than 20 feet in length. You'll find more on the merits of various folding systems and demountables on my Web site.

Building it yourself

While there has always been a small core of talented enthusiasts who prefer building their own boats, there seems to be a resurgence in interest in self-building. Perhaps it's the rising cost of manufactured boats, the lack of available choices or a combination of the two. If you can find the space and assign some time to it, there's no greater satisfaction than sailing a boat you have meticulously put together with your own two hands.

Although you may not save any money over a bargain second-hand boat, there's an excellent chance that you'll get a better boat and one that suits your personal needs much better than that old clunker collecting dust and rot in some boat yard. If you do buy second-hand, you'd be foolish not to have it inspected. Buying a boat by a acknowledged designer is also a smart decision unless you really know what you're bidding for.

Make sure the sails are hoisted too during a survey if they are an important part of the pricing. A good boat with poor sails will perform poorly, so either plan to have the sails 'tweaked' by taking in seams to offset stretch or replace them. You don't need all the latest racing materials — a durable Dacron is a good value and with full-length battens, will likely last as long as you'll own the boat.

But for the most overall pleasure, consider the building options. First decide what sort of sailing you will likely be doing and then choose a design that satisfies your needs and looks good. Why are looks important? Because the way a boat shows affects part of ownership pride, the attribute that keeps you working when you feel ready to quit and which encourages you to share your project with your friends and colleagues.

If you're a first-time builder, choose a design backed by robust support as some earlier designs, although once considered very good, no longer have their designers around to answer your questions. Fortunately though, there are forums on sites like Boat.Net that might be able to help if you're stuck, though you will still have to decide what info is good and what is not.

Good luck with whatever course you take and like Dennis Connor, I know you'll soon be saying, "What a waste not to have discovered this unique sailing experience long ago!"

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