

Review of Nine Small Folding Day-trimarans

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www.smalltrimarandesign.com

As for all my reports that are made available through my website, these comments are the personal viewpoint of the author only. While it's inevitable that some may have different impressions due to their personal perspective and experience, the views given here are expressed with frankness and sincerity, based on knowledge and experience coming from a long affair with design, sailing and boat building.

FULMAR 19

The FULMAR 19 was a unique boat ... a one-of-a-kind. I say 'was' because sadly, it's no longer in production. It was developed in BC, Canada as an offspring of a kayak and tried to be everything-for-everybody. The craft could be paddled via a 'Sealegs' auxiliary pedal drive (through a pivot-down prop); it could also be sailed at a good clip (14 kn reported); it could navigate in very shallow water (18") and could not only be folded to 6' width for a trailer, but could also be dismantled for car-topping or storage in a far more limited space, as it could be broken down into six parts with a mast no longer than the main hull. Once assembled, it was ideally suited for exploring all the coves and inlets of the west coast—and particularly so for loners who like their own peace and quiet. While there is generally wind in the open water areas, there are also many places close to shore, often quite rocky, that are far more suited to paddling and the Fulmar could offer both. There was



a tandem seat for a passenger but that sank the stern a bit too much for easy propulsion. The boat (developed in the mid 1990s to my knowledge), had a fairly good beam for its time ($B/L = 0.58$) and a low sailplan of very modest proportion. The boat was one of the first production boats to carry a carbon fiber mast and being unstayed, this would flex and shed the gusts to keep the boat moving fast with low risk of capsize. The mast could also be rotated for rapid furling of the single sail from the cockpit, in the event of a sudden wind increase. The boat was quite hi-tech in construction with composite hulls of foam cored vinylester glass with Kevlar reinforcements.

The boat was also enjoyed by handicapped sailors, as they felt secure with the high stability and could enjoy the easy controls from the cockpit. Even if it was never a competitor to conventional beach cats and the like, it's too bad this interesting and unique design has gone.

WINDRIDER 17

The WR16s and WR17s have something in common with the Fulmar, in that the crew primarily sit facing forward. The Windrider factory enlisted the design genius of long-time trimaran designer Jim Brown to work this one out and for the WR17, they chose to move the main sailing cockpit aft and added a larger one forward for a crew or companion, as well as more storage space for those picnic trips. This boat is easy to sail and tough (being of polyethylene) and therefore ideal for rentals or for young sailors starting out. Although 2' shorter, the Windrider has the same beam as the Fulmar, so coupled with the extra weight of the basic roto-molded polyethylene hulls, was given a slightly bigger mainsail as well as an optional jib that can help drive the boat to some pretty high speeds.



The boat has proven particularly popular with first time sailors who find the stability of a small trimaran takes away the nervousness that comes from suddenly being heeled by a gust when you don't really feel in full control. But once these sailors progress, many of them graduate to something a little more high tech that might also offer a little more space.



One problem I personally have with all these small kayak-type tris where one faces forward while sailing, is that ones body twists sideways to help stability as soon as the boat heels. For me personally, this is just not a comfortable way to sail. You'll note on

the Fulmar photo above, that the skipper has slipped off the kayak seat and is using a small tramp to be comfortable. Just compare that to its closest replacement, the unique and quite different TRIAK, where the skippers don't have that luxury and therefore need to twist to compensate for the heel. But perhaps it's just a function of age :-)

WETA 4.4

The WETA 4.4 is the smallest boat in this review. Considerably smaller in fact at only 4.4 m length overall—little more than 150 mm (6") longer than the now famous Laser dinghy. But with its B/L of 0.80 this boat is VERY stable athwartships and together with its narrow hulls, can therefore be driven faster than any Laser. This boat is strictly a sports sailer—closer to a day-cat like a Hobie than any other in this review. The crew (generally only one but sometimes 2), sits out on the



windward rail rather like a wide catamaran and uses his/her body weight to keep this speedster level. Naturally, the boat is pretty wet at speed but in the warm waters of New Zealand where it was developed, that stops no one. Despite its relatively high cost, it is becoming very popular because it handles and sails well. The high cost comes from the relatively hi-tech construction—hulls being of foam-cored fibreglass with most accessory parts (cross beams, mast etc.) being of carbon fiber for light weight. Being very small, the design wisely uses small amas that will push under rather than permit the main hull to lift, so that there is some warning before a capsize. In Aussie/Kiwi tradition, the boat also sports a fairly long bow sprit with a proportionally large (8 m²) 'screacher' that is well named for

this boat. One of the small amas can be readily flooded after a capsize, so that the boat pivots about the main hull for easy righting. It just takes patience to wait for it to fill and then, once over, wait again for it to drain—but for this small size of boat, it's easier than righting a typical day cat.

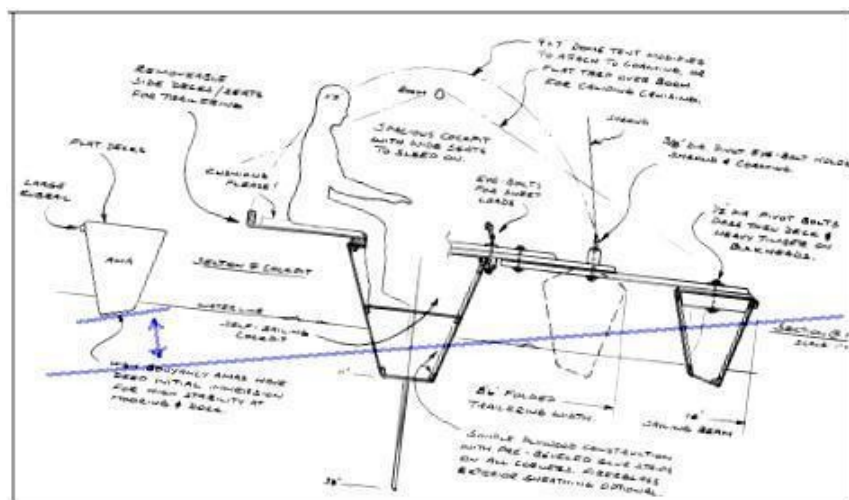
Rather than say more, I'll attach a small clip from a website report by the GM of High Modulus International (the carbon fiber design people) who finally got his hands on one of these—supposedly for his father-in-law :-)

"We recently took [Dad's] WETA 4.4 on holiday. In two and a half weeks away, I only missed two days on the water. Everyone loved it—I even got airborne with an old school friend that had never been sailing. Pitchpoled in a bit of a blow and steep seas with my sister-in-law—but neither of us could stop laughing from the moment we left the shore. But favourite times were cruising with my 3-year old son. He likes gentle breezes most as things got a bit too wet for him in a breeze—but we spent many afternoons just exploring the harbour, sometimes for several hours on end. Great family fun, with plenty to keep those with a competitive streak interested."

SEACLIPPER 20

Well, Jim Brown (in partnership with John Marples) has been at it again and he's come up with something that could certainly interest those ready to go weekending in a small but tough and stable trimaran ... a boat with enough heft to glance off a few underwater obstacles without much damage, as well as taming down the nervous excitement that a small

light boat like the WETA offers younger people who can afford one. The Seaclipper 20 has a narrow, flat bottomed main hull (vaka) and like myself, Jim has realized that this shape is not only easy and inexpensive to produce, but also works



well hydrodynamically for long slim hulls like the main hull of a trimaran. Other multihull designers like Bill Kristofferson and Richard Woods have also used this shape and in my website article on optional shapes for plywood hulls, I have long

stated that this is a surprisingly effective shape PROVIDED it's done right ... and that requires that the bottom is kept fairly deep and the sides are not too veed. Although Jim's boat sides are a little more veed than either my W17 or Richard Woods' new Strike, it should still work OK in my view. The new Seaclipper also has amas with a similar pitched bottom slope to those on my new W17, but pitched the other way. Although apparently done for the same reason, (to reduce wave pounding), I guess it depends on whether you look at the weather or leeward side. From tests that I conducted with Mark Gumprecht on his finely built prototype 12-footer, we agreed that it was the windward (upper) amas that annoyingly smacked the waves—so my W17 amas vee to the outside. With the bottom slope of the Seaclipper 20, this will now actually be more parallel to the wave-tops than even a purely flat bottom so I must assume that Jim is more concerned about the leeward ama. But it's nice to know that with pivot points in the center of each ama, they could probably be reversed if need be ;-). As much as I like the basic concept of Jim's new boat, there are a couple of aspects that I need to mention. To put a light rig from a Hobie 16 on a boat that is FAR heavier and more stable than the boat for which it was originally designed, might prove too much for this mast, especially since the shrouds are more inboard than normal—so raising the mast compression. Normally, a Hobie would just 'go over' and so relieve the load ... but not this beamy 800 lb twenty-footer! Also, the too-typical, puny 4-oz sail cloth of a regular Hobie 16 sail, is hardly man enough for this job. It's certainly a low cost start up solution and we've all admired Jim for his support to those with lesser means, but I think any builder should plan on something more substantial to be a better match for this cruiser. Finally, as the ama looks to be quite substantial in volume (guessing about 800 lbs buoyancy?), I have some concern for the strength of the single plank akas (cross beams) that act as swing arms for folding, should the builder decide to choose regular construction lumber. Sooner or later, someone will push this boat hard enough to bury an ama and that's a LOT of leverage on those arms ... even if they are cleverly designed to act like huge flexible wooden leaf springs. But without seeing the details, I can only suggest that some good laminated material might be in order for these parts and perhaps Jim's plans already call for that or even some added carbon here as well.

But I like the general concept and even though the boat will be no speedster, it's a design that can give a young couple on a small budget, a lot of weekend pleasure provided the conditions are within what the rig and swing arms can take.

DISCOVERY 20

I have long been an ardent supporter of designer Chris White and his Discovery 20 has long been a favourite of mine. Regrettably no one ever produced it professionally though there are a few fine examples still in use. Using quite the opposite approach to Jim's shallow-depth swing-arms for folding, Chris uses very deep vertical webs and takes his amas up almost vertically above the main hull when on the trailer. This would be a struggle if they were heavy, but they're not. The hulls are made using the Constant Camber system (See Construction Methods on this website), with thin veneers laminated over a cambered mold to give pre-curved panels that are joined together to create hulls that have a rounded-Vee section. This produces hulls that are easily driven at low and medium speeds, with the result that in most common wind conditions this is a fast boat. Personally, I really enjoy sailing 'a comfortable boat' and I get dismayed at the number of times I find there's some gunwale or stiffener sticking in my back or when the coaming I want to sit on is not even close to horizontal. So I really appreciate the comfortable cockpit of the D20, with its deep coaming giving lower back support. After all, I'll often spend all day out on the water and I don't need to get all racked-up at my age!



So when I designed the W17, the D20's cockpit was certainly in my mind and although I could not get the same coaming depth in the smaller boat, I'll get much the same comfort. The D20 is generally fitted with a custom rig and rotating mast and that suits the boat well. The boat is quiet in motion, drier than average, handles well, so is one of those boats that owners are reluctant to sell. Its

relatively light weight and easy lines assure it of good performance and even the crudely estimated *Performance Index* in my spreadsheet reflects that.

- This particular Performance Index is simply a product of the principal things that affect multihull performance—(LOA × BOA × Sail Area) all divided by the listed Weight. By taking the square root of this value, you then get a figure that very roughly reflects speed for comparison purposes. Yes I agree, there are a lot of factors NOT taken into account with this crude approximation, but the base figures used are easy to find and at least the general trend is indicated ... and quite fairly so I believe.

TRIKALA 19

The Trikala 19 is from the board of imaginative designer Kurt Hughes. This boat



was actually in production for a while in Spain but since then, a few have also been built by amateurs. A couple reportedly even cruised the Mediterranean in one! This is a boat design that always frustrated me—perhaps wrongly so.



For me as a designer, the looks of a boat are almost as important as its performance and the Trikala looks quite stunning from the bow, with its long fine entry and streamlined deck lines. But then, as it opens out to encompass a very wide cockpit aft, it always appeared to me that something distracted the designer or he just lost interest, as the view from the

stern quarter is not so elegant. It's no doubt practical but it's a shame that its wonderful efficient appearance from the bow could not in some way be maintained at the stern. But with that very personal comment aside, this is an interesting boat with no doubt a good performance. It would be an particularly interesting boat to build for someone wanting to learn about composite construction with a larger boat in mind 'down the road', as the Trikala is lightly built of foam core under fibreglass skins and would therefore provide a good learning experience. The boat does not fold in a conventional way but like some other small designs by Kurt, uses a sliding system with tubular akas, the port ones, sliding into tubes with Teflon runners

behind the starboard ones ... so the two sides are not exactly symmetrical—a factor that some potential buyers find disturbing—though the difference is purely cosmetic. (The larger 7 m, L7 by Mike Leneman, also uses a similar sliding system; though in this case he uses fiberglass channels—see my REPORT on SMALL TRIMARANS for more on the L7, available through my website.)

STRIKE 18

The STRIKE 18 is a new cruising design by the current plywood king, Richard Woods, recently of the UK. Richard has worked plywood into many of his simple but efficient catamaran shapes over many years and was seemingly encouraged to create this somewhat unusual low-budget design, for exploring the Canadian West



coast where he now resides. It is based on the use of more recent designs of catamaran hulls that are larger in volume than say the Hobie 16. His study plans are in fact drawn around the Quattro 16 that is molded with a long built-in fin keel and no dagger boards, which is a smart move for trimaran

amas, as nothing is as unnerving as having to run from side to side to drag up boards while sailing fast into some unknown but quickly shelving cove. What is unusual and quite different from the Quattro hulls that serve as amas, is the new central structure that Richard proposes.

The main hull is narrow and almost straight-sided and as I already mentioned in the report on the Seaclipper 20, this creates a hull that is surprisingly easy to drive—and one that makes good sense for a relatively light boat under 20', particularly when build-time and funds are limited. What Richard does above the waterline is unusual for a boat of this size however. He builds out an extension on either side of the main hull for about half the boat length amidships and then puts up a sloped windshield that spans the foredeck, effectively closing in the forward end of the cockpit in a cuddy and then offers the option of further enclosure to create a full cabin, just long enough for two single bunks with even a stove between them.

Extending such a square space out over the water only a foot or so above the waterline can only work on a boat that does not heel much but with 14 ft of beam and only a moderate sail area, that should be the case in most cruising conditions. How successful this all is, will depend on your needs. It looks OK in profile but the relatively large deckhouse shows its inexpensive and angular construction rather unfavourably in some views. But the hulls will all go through the water 'nice and easy' assuming it's not too rough, though I would expect windage to become a factor on a cabin boat of just 18 ft and 600 lbs. Windage on the road could be an issue too as the amas will be fairly high up when folded in—one of the few problems this design shares with the D20. But if you want a small, stable cruiser at minimum cost for coastal potholing in selected weather that still sails quite decently, this is certainly one interesting option to consider. Putting a similar cuddy over the cockpit of a D20 as others have done, might be another.

CROSS 18

The Cross 18 was designed by the famous trimaran designer Norman Cross about 30 years ago. Not surprisingly, like many other designs of this multihull pioneer, this design still has merit today. It uses a simple hinge system for the amas, so that they fold up through 180 degrees to lay side-by-side upside-down over the open cockpit. Both the main hull and amas have a simple vee-bottom with single chine.

By today's standards and trend, both hulls have more rocker than today and the center of buoyancy is farther aft than current designs. While this may not help its overall performance, it would certainly help the

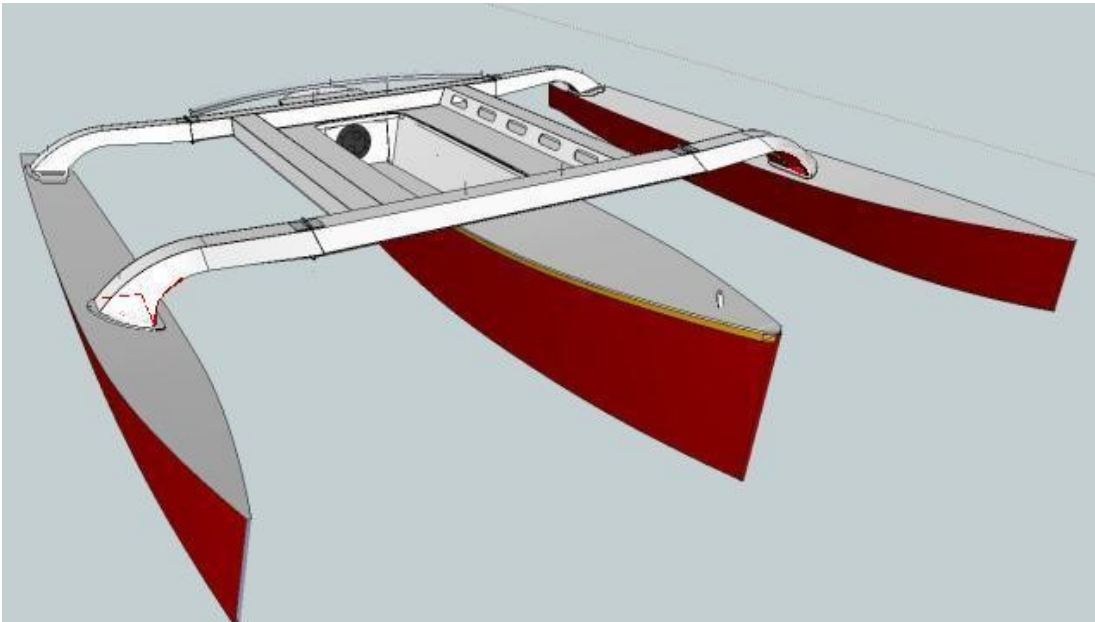


boat to tack easily, especially when combined with its significantly cut-away forefoot. The boat has a reasonable sail area for its weight and would be fairly easy to build as the construction is quite simple. Study plans are still available at \$25, with individual build drawings priced at \$20/sheet—so if there are 8 sheets, that could be \$160. The only consideration I have is that the design IS now somewhat dated and there are a few newer designs now on the market that would

not only outperform the Cross 18, but also be more likely to retain an acceptable resale value because they are of more recent vintage.

W17

This is my newest design, created during 2009 and completed early 2010. It's hard to review your own boat without being accused of inevitable bias, so I will simply



tell you about it and point out the features I've incorporated and why. Time will show whether it's as good as I expect it to be. This is a primarily a boat 'to just enjoy sailing in'. She's designed to be comfortable, drier than average, fast and efficient, and will be just at home on a weekend camping cruise as on the circuit.

Like the other two most recent designs in this review, I opted to go for a simple, fine lined box section for the main hull. This gives reasonable displacement for low draft and is very simple to build. If the volume is kept low down through fairly straight sides, the form is surprisingly efficient for narrow hulls, even in rough water. The amas are also of simple box form, but the bottom inclined in the opposite direction to those of the Seaclipper 20, in order to not slap on windward wave tops—creating unwanted spray and noise. (*Ed: The ama bottoms also have a unique twist to them that is explained under **W17 Review of Hull Forms**, elsewhere on my website.*) The cockpit is as close to that of a D20 as I could make it and should be equally comfortable with its sloping coaming close enough in to give some lower back support. I have even moved the main hull gunwale to the outside to that one can be comfortable sitting down on the cockpit floor—which being well

above the waterline, is therefore self-draining. I've used a somewhat similar hinge system to that of the Cross 18, except that my boxes are shallower and wider for less water and wind resistance and in addition, the forward one has a fairing to further lower resistance and unwanted spray. The amas will fold over and lay upside down over the cockpit for trailing. This will not only keep the cockpit contents safely in place but they will then create little extra windage behind a vehicle. The boat has a neat 'under the bottom' kick-up spade rudder that is very efficient and this concept is similar to the kick-up rudder of some kayaks and was used on the small 12' prototype I tested last summer, courtesy of builder Mark Gumprecht. The dagger board is also unusual in that it is what I call 'a pivoting one'. It's still a dagger board, though as the slot is not a long one the board only pivots about 30 degrees. But that's significant in practice as this will quickly reduce its draft by about 12" (300 mm), enough to pass over most unexpected obstacles without much damage or an abrupt stop. The rig is rather unique too, as I am offering a rotating wingmast design as a free bonus to those who actually build the boat and not just buy plans. Once I see pics of your boat half built, you get the mast design details with a how-to manual—and it's something most builders will be able to build themselves with a little care and ability to follow instructions.

What I AM confident in is that this boat will be easy to trail and set-up, a pleasure to sail, drier than most, satisfyingly fast with 'a special feel' to her and above all, extremely comfortable.

But ultimately, it will be the owners who are building now, who will write the epilogue on this one.



Go to the **W17 STUDY plan** on my website for more info or visit the **W17 BUILDING NEWS**, to see how other builders are progressing. Happy sailing !!

Comparison Chart

Model ►	Fulmar 19	Windrider 17	WETA 4.4	Seaclipper 20	Discovery 20	Trikala 19	Strike 18	Cross 18	W17
Designer	Blackline Prod	Jim Brown	Weta Marine	Jim Brown	Chris White	Kurt Hughes	Richard Woods	Norm Cross	Mike Waters
Description	Cruise Tri	Day Tri	Sport Tri	Cruise Tri	Day Tri	Day Tri	Cruise Tri	Day Tri	Day Tri
Length	5.8m / 19'	5.3m / 17'	4.4m / 14.4'	6.1m / 20'	6.1m / 20'	5.8m / 19'	5.5m / 18'	5.49m / 18'	5.2m / 17'
Beam OA	3.35m / 11'	3.4m / 11'	3.5m / 11.5'	4.72m / 15.5	4.65m / 15.25'	4.12m / 13.3'	4.3m / 14.1'	3.57m / 11.6'	4.2m / 13.8'
Folded	1.83m / 6'	2.4m / 8'	1.7m / 5.6'	2.6m / 8.5'	2.6m / 8.5'	2.44 / 8'	2.4m / 8'	1.98m / 6.5'	2.2m / 7.2'
Float volume	Low	Medium	Low	Med-high	Med-low	High	Medium	Medium	Med-high
Weight listed	118kg / 260#	145kg / 320#	100kg / 220#	363kg / 800#	238kg / 525#	245kg / 540#	272kg / 600#	181kg / 400#	181kg / 400#
Sail Area m ² / ft ²	7.43 / 80	13 / 139	11.5 / 124	20.4 / 220	21.8 / 235	19.25 / 208	19.2 / 204	16 / 175	16.7 / 180
Sail source	Custom	Custom	Gaastra	Hobie 16	Custom	Beach cat	Beach cat	Custom	Custom
Construction Matl	Vinylester	Polyethylene	Glass/foam	Ply-epoxy	Veneer-epoxy	Composite	Ply-epoxy	Ply-epoxy	Ply-epoxy
Cross beams - akas	Vinylester	Alloy tubes	CF tubes	Wood	Wood	Alloy tubes	Alloy tubes	Box beams	Box beams
Estimated Matl Cost	~\$8000	~\$9500	~\$13000	~\$4000	~\$5000	~\$6000	~\$4000	~\$3000	~\$3500
Accessories	Vinylester	Al-alloy	Carbon	Hobie 16	x	x	Cuddy	Wood	Wing mast
Features	s	F&A sitting	CF Mast	Swing arms	Beam fairing	Telescopic	Hinged	Hinged	Hinged+fairing
Plan Cost	N/A	N/A	N/A	\$250	\$295	\$500	~\$230	\$20 per sheet	\$160
Appearance	Kayak style	Day cat style	Day cat style	Large cockpit	Large cockpit	Large cockpit	Large cockpit	Large cockpit	Large cockpit
Year of availability	~1995	~2002	2007	2010	1986	~1995	2009	~1980	2010
Comfort	good for 1	good for 2	sport sailing	very good	excellent	very good	very good	good	excellent
Space	1	2	2	4	4	4	3	3	3
P.I. = L*B*SA / Wt	64.3	81.2	93.3	85.2	136.5	97.3	86.3	91.3	106
Sq.Root of Perf.Index	8.01	9.01	9.66	9.23	11.7	9.86	9.29	9.55	10.3
YOUR RATING?									