West Wind

The Newsletter of the NZ Zephyr Owners' Association

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Editorial

This West Wind has been slow out of the blocks. Kids hockey, painting P Class, refurbishing a club Starling, and an occasional foray onto the water have all contributed to the delay. Naturally, not all the tasks got done, so the Zephyr is now at the back of the garage, still in need of a new coat of deck varnish - next year maybe.

So, enclosed is a wrap up of the class events over the winter. Some of it is already on the web site, but is published here to in order to create a narrative of class events over the years.

AGM Minutes

These are on the web site for those interested. The attachments for the AGM are published herein.

Wellington Makes Rule Change Proposal Comments

Wellington owners are seeking to reverse the make weights rule. Their proposal and reasoning appear elsewhere in this West Wind. However, their suggestion prompted me to review the original proposal, first mooted in 2010 along with a proposal that the weight of Zephyrs be increased. The hull weight rule proposal ultimately failed, but the rule affecting the position of make weights passed, seemingly without a lot of documented independent discussion.

The Wellington proposal to reverse this rule change and return make weights to the transom is based on the claim that Zephyrs #522, 523, 524 have at least 5kgs of additional lead. I emailed all owners, but have not been unable to verify this for #522 and #524, so the issue may not be as widespread as is claimed. The ZOA has also done its "level best" to increase the weight of hulls to reduce the need for additional make weights.

The rationale for the rule change is also slightly misquotes the current rule. The current rule (2.3.1) allows weights to be placed anywhere in (not on) the boat, and it does require that they be readily visible and not inside a buoyancy tank.

As was pointed out in the original discussion on this rule change, 5kgs may be around 10% of the hull weight, but only about 3% of the total hull and skipper weight.

It is a widely believed that weight should be concentrated in the middle of a boat, but that tends to be keel boat, not dinghy, dogma. Again, in the original discussion, some put the view that transom weights were an advantage. The argument was that there is a limit to the skippers ability to move far enough aft to balance the boats on a reach and it that situation, transom weights confer and advantage.

Practically, attaching weights inside the boats is much easier than on the transom. There is also a practical limit to the amount of weight that could be mounted on the transom too, probably around 2-4kgs, so a maximum make weight rule would seem to make more sense.

However, on balance, I think the move to position the

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A Carbon Mast Experience

I was tasked at the Zephyr 2011 AGM to write a summary document about Starling class carbon mast development with a focus on any possible relevance to the Zephyr class.

Some years ago the Starling class embarked on a carbon mast programme. The catalyst came from a particularly blustery Murrays Bay Winter regatta where about 20% of the fleet either bent or broke masts in 25 knot plus winds. A number of participating sailors, parents and associated yacht clubs suggested a carbon mast might overcome heavy weather failures. Added impetus came from re-tooled GRP hull production by MacKay Boats and potential export opportunities. Because the Starling had a fragile mast extrusion, it was believed the MacKay upgrade should not be exported with a forty-year-old un-tapered alloy mast of questionable durability.

What does all this have to do with Zephyrs? In the recent past, Zephyrs have had mast problems of a different type. i.e. inability to maintain suitable supply with appropriate quality control. NZ Rigging may have resolved that issue with a new die and once teething problems are resolved, alloy spar supply should be assured. However it is worth considering the challenges faced by Starlings should the Zephyrs be forced down a carbon path at some point in the future. Both classes have similarities, being cat rigged, single-handed, one-design boats with sails and spars from single suppliers. Both boats have established optimum crew weights and any changes to sails or spars potentially obsolete existing rigs. For the Starling this is a greater consideration due to larger fleet numbers and more extensive fleet distributions. i.e. 1400 boats and 100-150 boat national championships.

The parameters for the Starling project were:-

- Develop a carbon mast suitable for export
- Maintain the existing crew weight optimum close to 62 kg.
- Provide a bend characteristic similar to the alloy mast, enabling continued use of the existing sail thus avoiding additional costs. If possible maintain similar performance to the alloy mast, enabling its continued use.
- Have only one carbon mast option available.

Through contacts at Southern Spars, the Starling class ended up with a three-stage development culminating in a spar that behaves similar to the alloy section and favours the targeted crew weight. The point was proved at the 2012 Match Racing Nationals where six identical GRP boats were all fitted with identical MK III carbon masts. Sailor feedback and boat performance favoured sailors close to the 62 kg weight target. This re-enforced the need to have multiple identical masts for accurate evaluation.

A recent class ballot gained insufficient votes to cross the 66% acceptance threshold and at present carbon mast availability will be confined to export boats – should any orders be received.

With respect to the Zephyr class, there are useful lessons from this and other centreboard dinghy classes' carbon conversions.

- One-off production for the purposes of development need not be expensive if done within the class by a competent amateur. Six fully rigged Starling masts built for the Match Racing fleet cost about $700 each in materials.

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Zephyr Class Rules
Materials and Measurement

As many of you know, I am knowledgeable on class rules generally. In my day job, I am a patent attorney, and work on technical documents much of the time. For many years I was the chairman of the classes committee of Yachting New Zealand, which was the technical committee, which used to control all National class rules.

Ideally, class rules should define all of the parameters of the boat which the class owners wish to control. That does not seem to have occurred fully in the Zephyr class, or at least there is a difference of opinion as to what the existing rules control. A big part of this is that the rules have not been updated to cover advances in material technology. Therefore, we need to consider what they should control. The current question is in relation to carbon sheathing, but there is potential for many more, unless the rules are changed to allow specified alterations & materials, and forbid anything not specifically permitted.

The most basic rule on hulls, rule 1.6.1 requires hulls to be built by a builder approved by the ZOA, and in accordance with the current specification and plans for the construction of Zephyr hulls. The rule does not allow for addition of any items, other than those specified, to the hull, if the addition of items are "*alterations*". See rule 2.1.1. Logically, additions need to be "alterations, as otherwise you could add an extra meter or so to the hull length without being in breach of the rules.

PAINT AND SHEATHING

Therefore, on a strict interpretation of the rules, additional items are forbidden. However, a number of additional items are found on the boats, but not in the rules. The most obvious is coating, both epoxy sealer, and paint. Clearly this should be permitted under the rules.

Another is some form of fibre reinforcing. It is clear from the ZOA published guide to finishing a Zephyr hull that it is regarded as standard practice to add fiberglass or other sheathing material. Many boats have been sheathed with fiberglass, but others have been sheathed in other materials, for example Geoff Collins' boat, No. 32, was found to be sheathed in Dynel, and Steve Pyatt reported that his first boat was sheathed in carbon fiber (not by Steve, I hasten to add). I understand that the majority of the fleet is sheathed in one way or another. The number of boats which have been sheathed on both sides of the hull surface is unknown.

Any boat which has been sheathed following the recommendations in the ZOA guide to finishing a Zephyr hull will be at least partially sheathed on both sides of the hull bottom in the cockpit floor area.

A group of well known and well sailed boats, i.e. those owned by Tim Snedden, which have won the Nationals a number of times, have complete carbon sheathing of the centrethwart.

The number of boats that have been sheathed in carbon fiber on one or both sides of the hull's surface is also unknown. This cannot easily be tested by the measurer without some destructive form of test.

FAIRING

Most boats have been faired & filled at some stage. This is necessary on older boats that have not been sheathed, as they develop ripples. Should there be any control on the thickness of fairing material, or the material used?. At the moment, on a strict interpretation, fairing is against the rules. Clearly, it needs to be allowed, but we need to stop some bright spark from totally altering the bottom shape.

MATERIALS

The materials available to boat builders are evolving quite rapidly. The current cheap standard for a sheathing material is fiberglass. The cheapest version of fiberglass, which is the one found in most boat shops is called E-glass. There is a superior type of glass, S-glass, which is approximately 20% higher in tensile stiffness. This is relatively rare, as it is much more expensive than E glass, and indeed often more expensive than carbon fiber. It tends to be used only in places where rules or other technical requirements stipulate the use of fiberglass only.

There are a large number of newer fibers available. The most popular one for building boats currently is carbon fiber. This is available in a range of different tensile stiffness, getting progressively more expensive. There are also the aramid fibers such as Kevlar, which is significantly stiffer than fiberglass (but very difficult to sand, which is one of the reasons that Kevlar is not popular as a sheathing material).

I understand that there are a number of new materials which are found at the really high tech edge of boat building, (for example, in the new Americas Cup catamarans) which have vastly better characteristics again than carbon fiber. Some of these involve materials such as DYNEEMA and SPECTRA, which are trademarks for a very common plastic (ultra high molecular weight polyethylene, or UHMWPE), which has been stretched and manipulated in such a way that it becomes a very strong fiber. This fiber can easily be made into cloth, and it is only difficulty in making the fibers work with resin which has prevented the cloth becoming common in boat building use.

The question then is what materials should be permitted, and what, if any, should be banned, for use in sheathing Zephyrs. Clearly, we should allow sheathing in glass, as that already occurs. But should this be limited to E-glass or should S-glass be permitted as well? If we do not permit S-glass, how do we tell the difference? I am not aware of any test which can be applied to a finished boat.

Some sheathing with carbon has taken place already. Should this be limited?. Should it be permitted only in specific areas?. Should existing wholly or partially sheathed boats be grandfathered?. If so, how is the measurer going to know **when** the carbon was added?.

WOOD AND PLYWOOD

Currently, the rules provide that certain parts of the boat are to be made from either "clear timber" or "marine plywood". However, with the knowledge that the rules also need to be amended to permit sheathing, as the majority of the fleet already has some sheathing of some sort on their boats, I would like to have everyone's opinion on which of the following items qualify as "timber" or "plywood".

1. Kauri timber
2. Cedar timber
3. Balsawood timber
4. A panel made up of a top veneer of kauri, a middle veneer of balsawood, laid with the grain horizontal, and a bottom veneer of kauri, all glued with epoxy.
5. A panel made up of a top layer of fiberglass cloth attached with epoxy, a middle section of cedar timber, and a bottom layer of fiberglass attached with epoxy.
6. A panel made up of a top layer of kauri veneer, attached with epoxy to a middle layer of end grain balsawood and a bottom layer of kauri veneer, attached with epoxy.

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7. A panel made up of a top layer of carbon fiber cloth attached with epoxy to a middle layer of end grain balsawood, and a bottom layer of carbon fiber cloth attached with epoxy.
8. A panel made up of a top layer of carbon fiber attached with epoxy to a middle layer of PVC foam, and bottom layer of carbon fiber attached with epoxy.

Clearly, number (1) is "timber", and number (8) is not. But the real question is: where is the dividing line, **exactly**, in that list? I am sure we can have many discussions on the exact position of the dividing line. As we must already allow some form of sheathing, and fiberglass sheathing on both sides, is found on at least some parts of many boats, the poor measurer has the rather difficult task of deciding exactly where the boundary line is. It would be better for all concerned for the rules to be more specific.

Addition: Framing / Support

The next question is what, if any, structural additions should be permitted to be added. Nearly all boats have some form of strengthening around the side stay chain plates. Some recently built boats use carbon fibre for this job. Strengthening of this area is clearly desirable, but any form of strengthening is arguably not currently legal.

Many boats have Zimmer frames. Usually, these are attached to both the centrethwart and the floor battens, thus materially stiffening the bottom of the boat. Many boats have additional deck beams in the side decks.

As "deck posts are optional", presumably it is acceptable to have a number of these, in a crane beam type arrangement, to build a strengthening girder between the hull and the deck, and as the material is not specified, foam filled carbon tube would be legal? Some boats have mast step support, with a link to the deck, but many do not need this, as the front bulkhead is very close to the mast in those boats. So: What additional framing & strengthening should be permitted, and what (if any), should be banned? Should the material used be controlled?

Fittings etc.

All of the items not specified in the rules to be made of wood or plywood, except the spars, do not currently have any control on the material to be used. Many boats now have carbon fibre fittings, rudder boxes, centerboards etc.

Conclusions

Clearly, if the traditional all wood Zephyr is to stay the norm, the rules are becoming inadequate to handle new materials. This is exacerbated by the current builder building hulls which are relatively light, giving owners of new hulls a lot of weight to play with. We need to decide, as a matter of relative urgency, what items are to be controlled in the rules, and what are not.

My Personal view.

Firstly, an admission. I am a carbonaholic. I enjoy building things in carbon. I have found it to be very easy to use, and it gives me great freedom of expression in building bits for my boats.

From the measurement point of view, I consider that many of the possible restrictions will be very hard to assess properly, with the consequence that either an ignorant or dishonest person will be able to get away with breaches, or the measurers will have to be very tough, and drill test holes in finished boats, for all boats.

From the longevity point of view, sheathing, and the addition of framing etc., will definitely increase the stiffness & durability of hulls, and reduce the maintenance required.

Therefore, assisted by the engineers report to the effect that there is unlikely to be all that much difference, I tend to personally favour an open slather approach, rather than tight restrictions.

Whatever approach we decide, as a class, to take, it is important that the basic direction is taken soon, as otherwise, we risk a split within the class.

Andy Knowles,
Tauranga

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- Several versions of different bend characteristics may need to be built before an optimum model is proven. The most reliable final testing process revolves around having at least three identical masts used by skippers of differing weights. This then helps establish an optimum crew weight for that particular mast design. Analysis is problematic given the wide range of variability in sailor abilities and the trial boat differences.
- Southern Spars designers advised that in other classes, once a final mast design is confirmed, practice and race experience has tended to drop the optimum crew weight by several kilos as sailors come to grips with the different material and learn how to exploit its properties.
- Carbon masts will be lighter and potentially faster, so existing alloy mast obsolescence is probably guaranteed. That situation is not confined to carbon masts, as the Zephyr class has already experienced. The superiority of the McKechnie mast over the preceding Baverstock mast and the Baverstock's superiority over original wood masts are well known. Baverstock and wood spars are no longer seen at the front of Zephyr fleets.
- One problem we faced with Starlings was reluctance by almost all the top sailors to use the carbon mast in regatta racing. This is the one place where objective analysis could be conducted by the more skilled of the class participants. Sailors were not allowed to win regattas with a carbon mast so most refused to use it, sighting personal desire to win the specific regatta in question. The Zephyr class is less likely to face this problem as its mature participants are more likely driven by collective advancement than the majority of top Starling sailors!!
- Very different individual boat rigging systems will provide challenges for tooling mast bases, goosenecks and sail control attachment points when test spars need to be rotated through the fleet.

Summary

If at some future point the Zephyr class faced a lack of suitable alloy spar supply, the process of carbon development and evaluation is well understood, relatively straightforward and quite affordable. It would probably take at least 12 months of intensive work to arrive at a production mast from a standing start. The bigger challenge would be the politics of such a move and given the debate over carbon hull sheathing, potentially divisive. For that reason, it would appear only worth embarking on this path if the NZ Rigging masts ceased to be available or if an overwhelming majority of the class sailors supported such a move. To date, neither situation looks likely.

Brian Peet
July 2012

Make Weight Rule Change Proposal

The following has been received from six Wellington Zephyr Owners requesting a change to Rule 2.1.3. Their rationale is as follows;

An unforeseen situation has arisen. Therefore, we, the undersigned, believe that the class made an error in allowing lead "make weights" to bring a hull up to minimum weight to be place anywhere in or on the hull.

Rationale

The "make weight" used to be restricted to being placed over the transom in clear view. Generally hulls were weighed in at a few kg over the minimum and so very few, if any boats had make weights attached. Possibly, with the advent of lighter building materials, but certainly since the make weight being allowed anywhere, the builders/finishers have made the hulls as light as possible with a view to putting make weights in the most advantageous position, centre, low in the hull. It is a well known fact that it is best to keep the weight out of the ends of a hull.

Although there was considerable discussion at the time, most of us believed that if any make weight was required it would only be at most, one or two kg and therefore, not really an issue. However, boats currently being produced 522, 523, 524 have at least 5kg of lead, making up around 10% of the hull minimum weight.

The situation that has evolved was unforeseen and does make a positive difference in the sailing characteristics of the boat, especially up wind performance. These boats have a higher potential speed and it is in the classes interests to make a change. Rule 1.3.1… to ensure that all boats have the same potential speed.

Proposal:

That the class revert to the old rule regarding make weight. That is…..

2.1.3. Hulls weighing less than the minimum weight are to be brought up to weight by the addition of lead. This additional weight shall be attached to the upper corners of the outside face of the transom. Weights must be attached to the hull so as to be readily visible.

Coming Events 2012-13

The season is picking up with a number of events on the horizon.

Rotorua Sprints: Rotorua Yacht Club,
October 13th and 14th. Briefing 1030hrs, first race at 1200hrs. 5-7 Races Saturday, 5 Races Sunday.

Taupo Zephyr Nth Island Champs and Wooden Boat Regatta

Lake Taupo, 1st and 2nd December 2012.

Notice of Race at www.zephyr.org.nz

Hamilton Zephyr Weekend

December 15 &16. Details at www.hyc.org.nz shortly.

Zephyr National Championships
Thursday Feb 7th - Sunday Feb 10th 2013
Manly Sailing Club
Manly, Whangaparoa.
NOR is at www.zephyr.org.nz

Recent Rule Change Results

Thirty one responses were received to the rule changes below. All were in favour. The following rule changes have therefore now passed.

That rule 3.3.2 be amended to;

3.2.2 Aluminium booms shall be Baverstock BS5 or Standard McKechnie die 57.15 or ***NZ Rigging Die F6 57.50mm*** round section with track attached, and built to the following specifications:

That 3.5.1 be amended to;

3.5.1. That portion of the blade below an extension of the keelson marked on the leading edge of the rudder shall fit within a rectangle 900 x 292mm.

That 4.3.2 be amended to;

4.3.2 Shells shall be constructed using either triple skin diagonal cold moulding or single skin strip plank, glassed both sides.

- Triple skin diagonal cold moulding; the shell shall be constructed of three skins of **at least 2.2mm** thick approved timber.

That Rule 4.4.3 (Section 4.4 Framing Timbers) be amended to;

4.4.3 Hulls shall be supplied by the builder with these framing timbers, side and athwarthship bulkheads glued in pace permanently.

That Rules 4.5.3 and 4.5.4 be added to 4.5 Finish and Supply

4.5.3 Owners may replace the decks, coamings, mast hole collar, transom, bulkheads, sidetanks or centrecase components with materials specified for the relevant use in these rules. Following any such replacement, the boat must be inspected and approved by a class measurer .

4.5.4 Other parts of the hull may be replaced only in the case of breakage or deterioration.. All materials used must comply with these class rules.

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make weights inside the hulls, rather than on the transom, has been a good one and that any move to reverse it, on the basis of the evidence offered, is premature. If "excessive" make weights continue to be a problem, I would favour a make weight restriction rather than a repositioning as proposed.

Halyard Locks

There has been some more debate over halyard locks and the difficulty Zephyrs have in being able to lower the mainsail from the deck. Wellington sailors feel this particularly keenly. The issue is slightly complicated though. The new masts are pretty water tight, in itself a safety measure and this would be "undone" by an internal halyard. An external halyard with a cleat at the base of the mast would appear to have some advantages, but halyard tension would change as the mast was raked back. Some innovative suggestions here would be welcome.

Winter Activity

Fleets in Tauranga and Auckland have been pretty active over the winter, so they should all be looking pretty sharp at the Nth Island Champs in Taupo. A number of new faces in the class too, which is particularly pleasing.