Rig size, why the taller mast?

Many, many classes have switched to carbon tubes. In most cases all they have done is switch from alloy to carbon and there has been a weight reduction in the spar and also, in 99.99% of the cases, there has been a reduction in crew weight.

That's a simple fact.

Some classes have been smart, like the 5o5, and went for a bigger spinnaker and that went some or all of the way to correcting the weight reduction. Others like the B14 simply grew the sail plan on the existing spar length, sporting square heads and the like.

When we started this process we were asked to keep the crew weight at 130-135kgs.

Given that the mast will be 20-30% lighter (that's including all the wires, the actual tubes will be about ½ the weight) then there is a significant reduction in Radius of Gyration. Test this yourself - take a 2m long bit of 25mm dia tube, take 2 weights from the gym, grab the tube in the middle and put the 2 weights alongside your hand, and then rock the tube. Pretty easy, now put those same 2 weights at the end of the tube and try and rock it again. Lot harder, that's radius of gyration. [RoG]

A reduction in RoG is one of the things that makes the boat a lot more fun to sail, but it also means the boat will roll back into windward after that gust that much faster and this in turn leads to reductions in crew weight coming to the fore.

You would have found a bit of this with the FRP foils, RoG works under water as much as it does in the air. Put 2kgs on the tip of the centreboard (as some single hander dad's did in Spain) and it makes a 29er docile!

To counter it we increase mast height a very small amount and increase the sail area up high. It's also known as an "air damm".

There are other factors, take a standard boat, heeled at about 6°, go from alloy to carbon and the resulting weight reduction means a reduction in "negative" Righting Moment [RM]. Yes, that's a tautology, but the net result is an increase in effective RM (another tautology somewhat), and that also leads to reductions in crew weights. In one of the boats I have just been doing, not too different in height to a 29er, it equalled an 8% reduction in negative RM.

So what can be done.

First thing is to decide if you want the 130-135kgs crew weight to remain? If you decided that 125-130 was a better target, then we don't have a problem! We can have rigs of the same height and that means that old mains can fit on new masts and new mains can fit on old masts. Need to stress, not well, but it's doable. We still need a square head to make the carbon mast work!

The other thing we can do is sneak every cm out of the system we can, and use a healthy size square head so as to gain area up high (this is exactly what the B14 did effectively) and that's also very possible.

The thing we need to do is get Europeans sailing the 2 boats that are destined for Weymouth and Arco!

At the moment we are operating on sketchy Australian sailors, with virtually no feedback.

It is your feedback that will determine what can be done, and how far we have to go WRT increasing the area (beyond a square head) and height (if at all).

JB