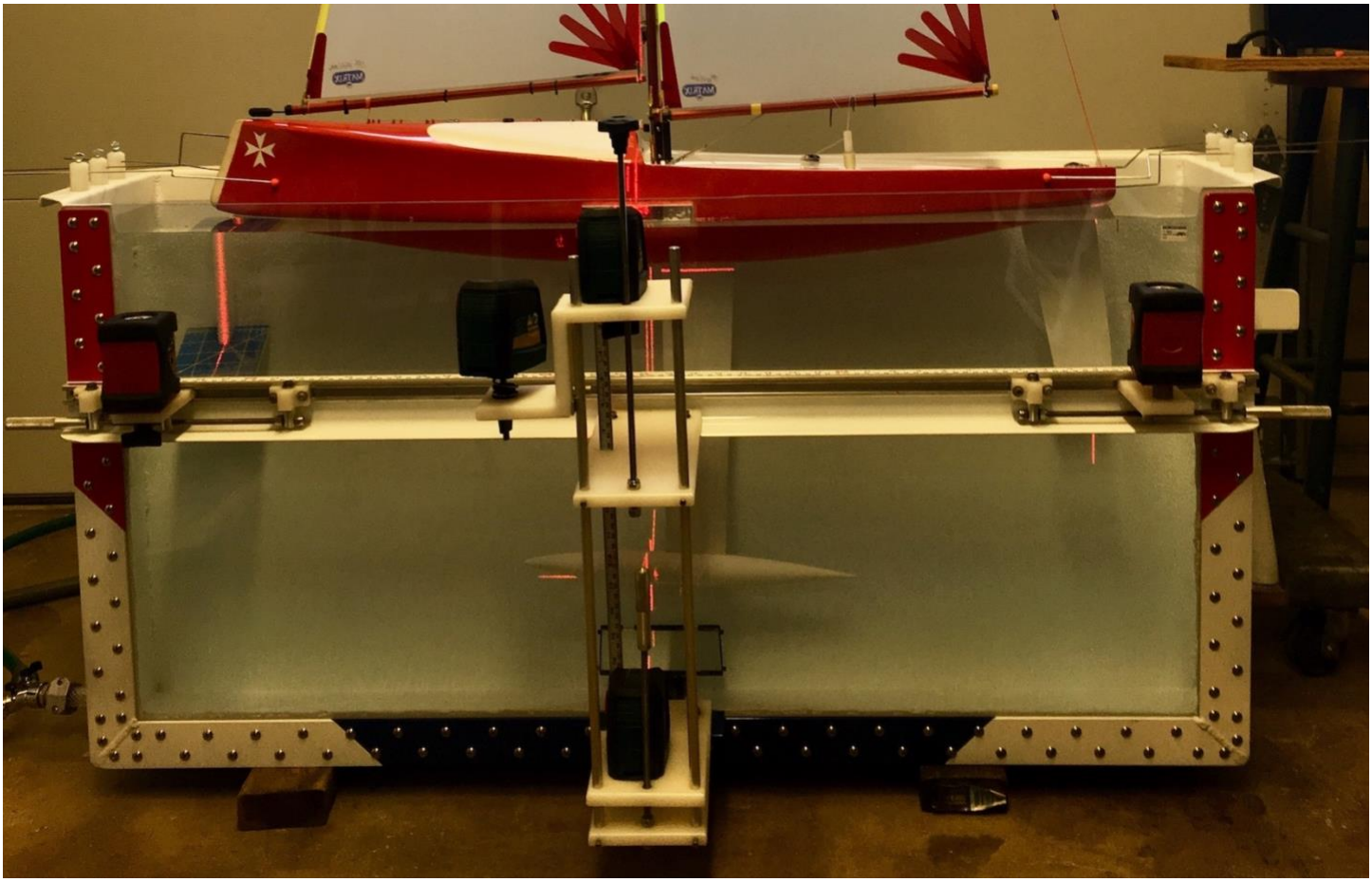


Ken and John's custom IOM class laser-based float tank. The measurement tape and the tank are independently certified to accuracy, and it should be operated by a certified measurer at events. Tank calibration is quick when Ken does it, as he is practiced and has a machinist grasp of the steps for accuracy. With the boat positioned with stops fore and aft and hands free from the instrument, lasers provide a quick visual confirmation of hull length, hull depth, and bulb depth. Ken and John have loaned the tank to the IOM class, with the stipulation Ken is involved in any maintenance so we don't screw it up. That is some unexpected Texas-sized generosity. The IOM is Ken's FR10 by FJC Design in Spain. Ken Weeks photo.

Ken & John's Amazing Float Tanks:

By Bob Wells

IOM USA Class Rules require float tank measurements at national championships, and Ken Weeks and John Kelsey teamed up to build some laser-based doozies for us for the 2017 and 2018 US Nationals. I first met San Antonio based Ken Weeks and John Kelsey at the 2017 USA IOM Garland Nats, where everybody admired their large float tank sized for measuring 10R, M, and IOM class boats. The float measurements couldn't go as fast as they should have because most everybody wanted to know more about that amazing tank. IOM builders Zvonko and Denis in particular lingered over the tank and asked questions. At the 2018 San Diego Nats here was Ken again, and this time with a new more compact IOM sized float tank in tow. Ken had hauled it from San Antonio to San Diego for its first official trial, and the boats were accurately wet measured in just 20-30 seconds by Mike Eldred with less chatter about the tank. The float tank passed in flying colors as this video by David Woodward will attest **here** (in post 11665). Ken and John are easy to talk to, and I wanted to know the story behind these sophisticated float tanks.

John Kelsey is the more experienced sailor of the two, with lots of big-boat racing before he moved into radio sailing. John was an American working in Australia when his marketing manager, Ross McDonald, lured him off his power boat and eventually into a partnership on a ¾ ton IOR boat that excelled in light air. Ross was a top sailor and an excellent mentor, and with an active racing schedule John evolved into a decent deck hand and tactician. They even took that ¾ ton on a Sidney-Hobart! Talk about an inappropriate hull type and size for those waters, and of course it was one of the nastier weather Sidney-Hobarts on record. John said they were down to just their storm jib and still going faster towards New Zealand than Hobart, but the wind did abate a bit and they did eventually finish. For his luxury 1977 Sidney-Hobart race experience, John was a

substitute tactician on the all-aluminum Kialoa III skippered by Jim Kilroy. Luxury is relative, as you slept on sail bags between aluminum ribs, but the ride was a lot better and faster. And I'm not done name dropping, as John was impressive enough in a Perth regatta for Alan Bond to put him on the Australia II team as tactician on their trial boat, Gretel II, so John was briefly a paid pro. John later worked and sailed in San Francisco, Seattle and Chicago before retiring to San Antonio in 2001. With no big water for sailing and a bad back from his years of sailing, John began model sailing after his kids bought him a hobby store RC sailboat gift. It didn't sail well, but it was his humble start in radio sailing, and it took. Currently John serves as the AMYA Open Class Secretary, is a member of Woodlawn Sailing Club, and a founder along with Ken Weeks of the fledgling Alamo Yacht Club.

Ken Weeks is a retired Engineer and accomplished machinist who began RC way back in 1972 in power boats, where he became President of IMPBA (International Model Power Boating Association) for the USA for a time as well as other posts. Traxxas now sells the axel design that he created. He left power boats for sailing models around 2001 beginning with hobby store model sailboats, and initially he sailed alone trying to improve them. Eventually he found Woodlawn Sailing Club and met John Kelsey. In John he had a collaborator to share ideas on how to make their collection of ETNZ, Vela, SeaWind, and Victoria sailboats perform better. From there they moved on to competing in the DF95 and Victoria classes that Woodlawn sails. Ken was recently appointed the AMYA Ten Rater Class Secretary and is a member of the Alamo Sailing Club.

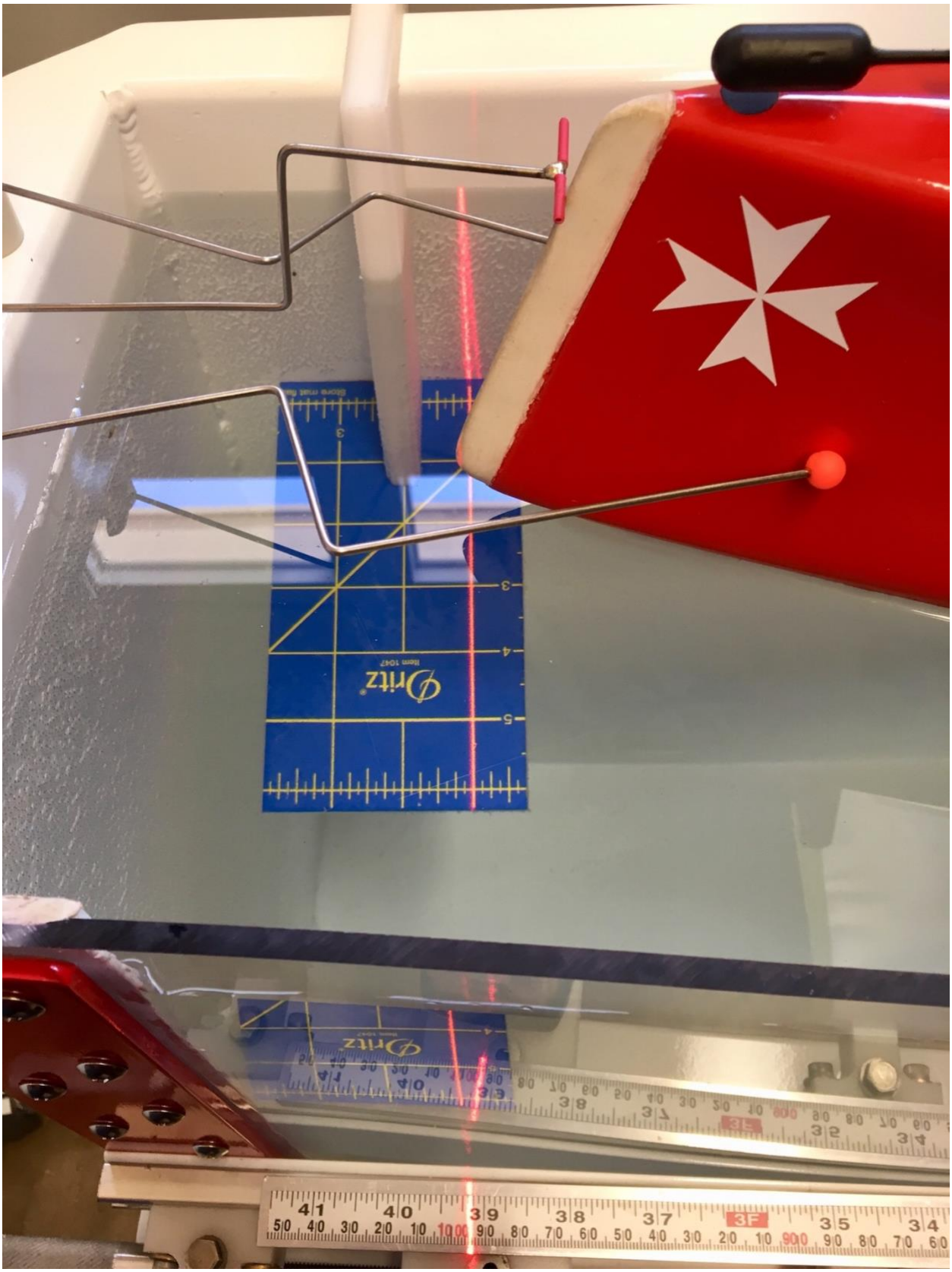
John and Ken were intrigued by the larger International classes also, leading them to purchase a Ten Rater (10R) and later M and IOM class boats. The IOM is a popular US class, but current IRSA M and 10R boats are rare here. The elegant 10Rs are the longest and tallest with the deepest fin of the IRSA classes; and their rule is based on the 1887 'length and sail area rule', which allows short waterline length boats to have a bigger sail area and longer waterline boats have smaller sails. With overhangs beyond their waterline they are light, sleek, seaworthy and fast. It is an 'open' rule with great freedom to develop design and construction, including rigs and sail plans.

10R certification requires wet tank measurements as part of the process, and it is needed to optimize the trade-off of waterline versus sail area. Obtaining certification was John and Ken's motivation to better understand the rule and create their tank. John spearheaded the rule research, which between the 10R class rule, the Equipment Rules of Sailing, and the Racing Rules of Sailing is not an obvious or simple task for somebody getting into it without mentors. The challenge was exacerbated because at the time the spreadsheet to create a certificate was not openly available. It was only available to IRSA Designated National Members (DNMs) for use by their certification authority to produce a "certificate", a restriction in place for document security. The spreadsheet available to the public (official measurers, designers, sail makers and owners) allowed only data entry, and could not produce the "certificate" or show the results of the various setups.

In 2016 IRSA acknowledged the dual spreadsheets was not workable, so the spreadsheet that creates a certificate for IRSA M, 10R & A classes became openly available. For security, each spreadsheet has a hidden algorithm with a code confirming that each certificate is from an official document. They were so relieved when Aussie Glen Dawson provided John with the IRSA spreadsheet allowing them to make the data entries and produce the certificate, which still needed authentication with the DNM certification authority signature and official stamp. Their 10R certification process has schooled Ken well for this part of being the AMYA 10R Class Secretary.

John and Ken also researched existing measurement tank construction and features, and finding little information available proceeded to develop their own. For portability and durability aluminum was an obvious tank body choice. For accuracy they used certified measurement tapes and before using the tanks at an event they had them independently certified for accuracy. For the desired hands-off and quick visual check of a floated boat they chose self-leveling lasers. The lasers were fitted so at the beginning of an event they could be calibrated if needed to the rule length and depth limits. To determine waterline for depth measurements they use the foam float shown in the following pictures. After calibration, floating each boat only required a few seconds of fore and aft alignment using stops, and then the boat was ready for a quick visual check to determine if the laser lines showed "go or no-go". The images with captions below describe in more detail the tank features.

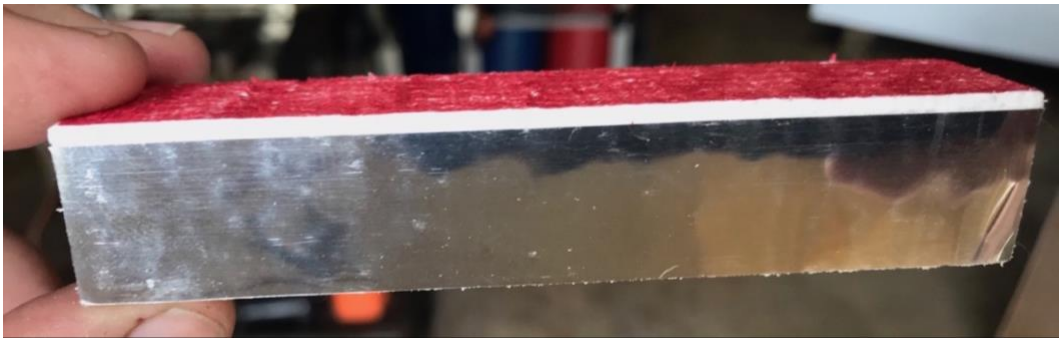
After traveling some distance to a major event, tension rises when a measurement issue is discovered. In that case the measurer shows the issue to the event organizer and/or Class Secretary for resolution. There were a few measurement issues in both the 2017 and 2018 USA Nationals events, and the tank became part of the solution to determine when the boats were compliant.



To read a laser line, you look at the line leading edge (right edge here). This image shows the laser line crossing about 1mm of bumper. It also shows at the bottom the same laser line about 7mm to the right of the 1,000mm mark. The hull passed after the laser was properly located and this image is only illustration of laser lines crossing the boat. The bow & stern stops that position the boat adjust readily, including this wave-piercing style bow. Ken Weeks photo.

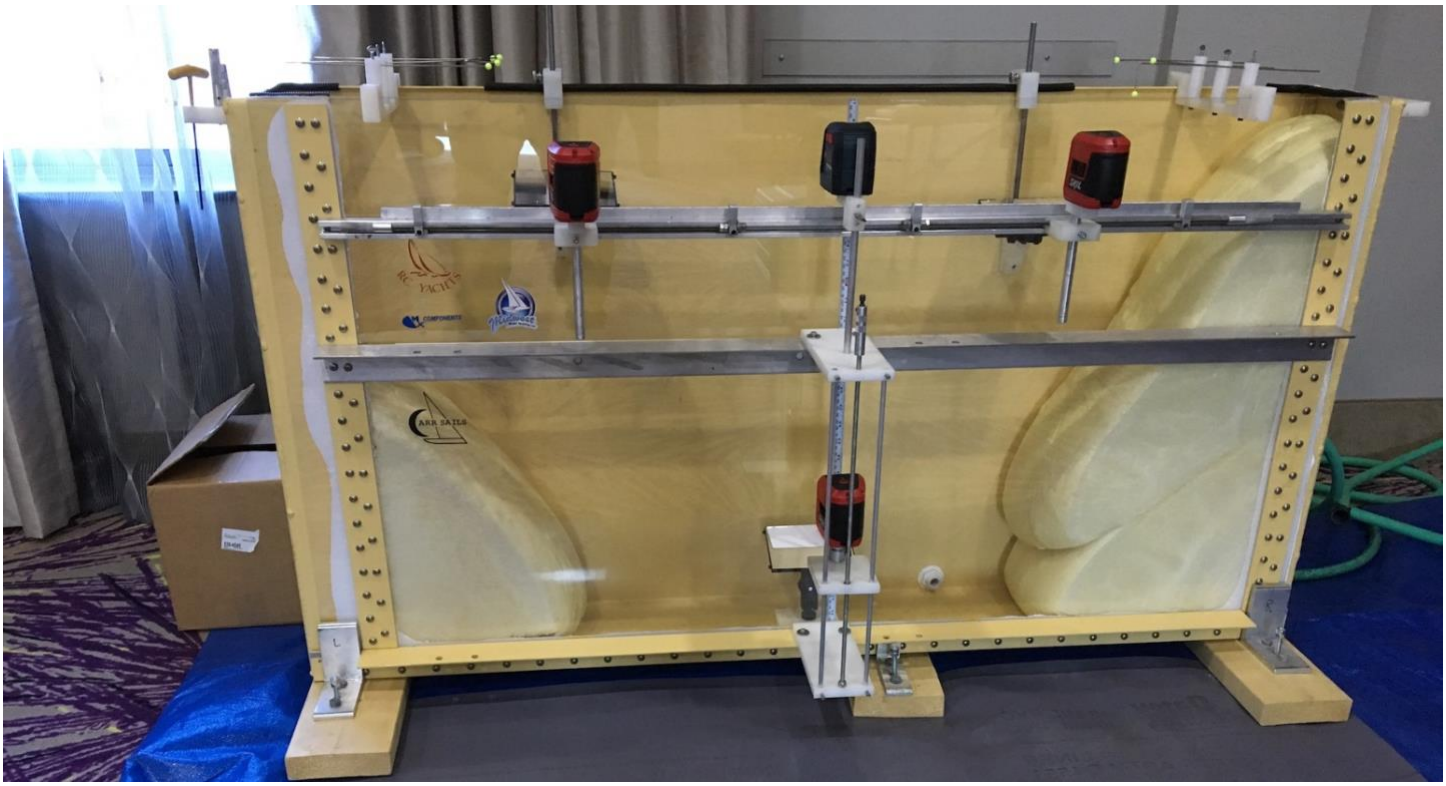
A close-up of the keel/bulb being measured by laser for depth, and this one passed. Note the vertical Starrett tape measure and the adjustability to calibrate for depth from waterline, and set with a lock nut. The lasers can be used to verify bulb cant as well, something everybody likes to know, especially builders. Ken Weeks photo.

The IOM tank with a close-up of the various lasers used, and there are two different laser models on this tank. The self-leveling SKIL 8203CL lasers offer line options for vertical, horizontal, or both, a feature Ken prefers. The self-leveling BOSCH GLL30s lack the option for vertical or horizontal lines only. They also have a built in "time-out" that shuts the laser off after an hour, which is reset by turning off/on. Both lasers are available at Lowes and Home Depot for approximately $80 dollars each. Both use "AA" batteries that last for days. Ken Weeks photo.



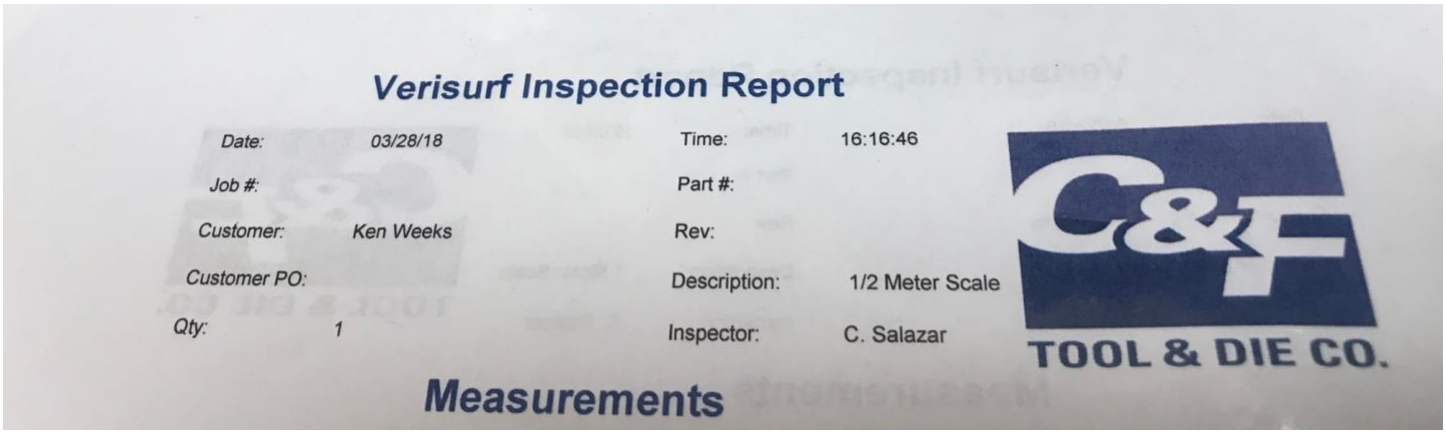
The key to establishing the waterline is this ¾"x ¾" x 3" Styrofoam block with a layer of ¾" chrome tape #17198 by Duct Tape. The foam is so light it floats with virtually no meniscus, and the face down chrome tape adds a clean edge to set the laser. Ken Weeks photo.

To support and promote IOM sailing in the Midwest, Ken and John want to have a local tank there too. This image shows their progress on IOM tank #2 at Ken's house. The tank's body is 1/8" thick aluminum fabricated by a local aluminum boat manufacturer's shop, and Ken manufactured the smaller aluminum components. The front will be 1/4" thick Lexan. This one gets a base too. You don't have to float an IOM to measure-in by rule, but they think it is a quick process that, along with weigh-in, assures compliance for length and depth. Ken Weeks photo.



This is Ken's original tank sized for 10R, M and IOM, which is set with lasers set for measuring IOMs at the 2017 USA Nationals. The body is cut to size from a power boat aluminum fuel tank. You might notice an extra laser is added to the IOM-only tank for the quick visual hull draft check, which is not an M or 10R requirement. Otherwise the tanks are alike. Bob Wells photo.

The measurement tape used on the tanks, with the accuracy certificate below. Ken Weeks photo.



A portion of the IOM tank #1 independent accuracy test, which showed accuracy within 0.1mm Ken Weeks photo.

A reader unfamiliar with IRSA International Class "control of the boat" philosophy might be wondering why the big fuss and effort over the measurement approval process before a major regatta. Why take one day for measurement check-in before a USA IOM Nationals or two days for an IOM Worlds? Isn't sailing supposed to be Corinthian and self-policing, and these are toy boats after all! The "self-policing" question is reasonable, but we don't think of radio sailing at this level as toy boats and neither does World Sailing for the record.

Some radio sailing classes are Corinthian regarding certification and event measurement check-in, and here the 40-year-old RG65 class comes to mind. Conversely IRSA International Class sanctioned events monitor the quality of the sailing, and one aspect is control of the boat for fair sailing. This assures folks who invest in attending will compete with boats meeting the rules. Boat control includes attention to the class rule and certification with class approved measurers. It also includes measurement checks as part of event entry. IRSA monitors many other aspects of their events beyond the scope of this article.

I think that Ken and John have done themselves proud with their wet tank measurement instruments. In my radio sailing travels, I've seen no tanks that compare with their quality of materials, assembly, or ease of use. Congratulation guys and thank you for supporting radio sailing as you do and making your tanks available to IOM USA.

The author's USA 12 having great fun in B-rig in Garland, TX at the 2017 USA Nationals. This was where I first met Ken Weeks and John Kelsey, and admired their amazing wet tank. Now I know them much better and look forward to sailing with them in Texas, where the wind and waves tend to be bigger whenever I'm sailing there. Alyssa Heyns photo.