NCESA

SUMMER 1989 Vol. 25 No. 1

E REPORTER

THIS ISSUE:

- A symposium and questionnaire on backstays by Sam Merrick
- Ten designated skippers responses to Sam.
- 1989 WOODIES WORLD'S REGATTA report
- 1926 YACHTING reprint "Sailing an Inland Lake Scow" by F. SLADE DALE

photo: Fred Vullo

COMMODORE'S COMMENTS

Our sailing season has begun. . . new boats, new ideas and visions of first place. Unfortunately, we still have some old problems that have to be dealt with.

I commented last fall in the **Reporter** on the participation at the National Championships in Chautauqua. Although the numbers were there and I saw new sailors and yacht clubs represented, I was disappointed at the turnout from the long-standing Midwest contingent. Where were the Madisons, Pewaukees and Spring Lakes? I know these fleets exist, as well as other large fleets that don't bother to send boats. Do we have to depend on new fleets and the ''East'' to support our championship? I hope this is not the case. Are we becoming too complacent - hoping that someone else will take our place at a major regatta?

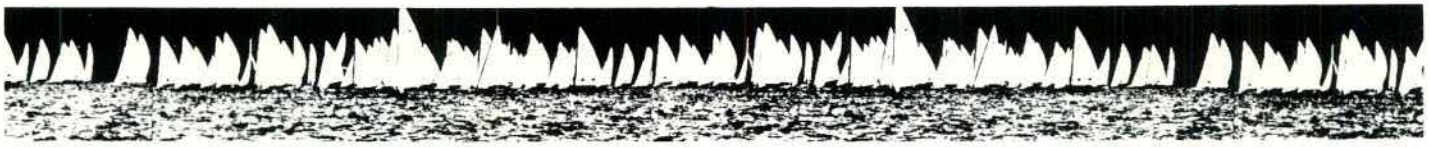
Most major regattas take place in mid-August, with the Nationals just a few weeks after. This can be a conflict for schedules and time. The NCESA is here to support all E-sailors, not just a few.

NCESA representatives (Board Members) from your own area should certainly make an extra effort to attend major regattas. This reflects on other sailors who do or do not participate. Too often I see a lack of interest by some Board Members. Make sure your representative is doing his part!

It takes an extra effort to promote and build upon what we have. Each sailor, fleet captain, director and officer can *and should* contribute to the well being of the NCESA.

The summer is short and will soon be here. Regattas begin in May and end in September, so be sure to attend a few. By getting together on a national basis. . .this is how our organization began.

Good sailing,
Paul Wickland, Jr.



A SYMPOSIUM ON BACKSTAYS

by Sam Merrick

BACKSTAY CONTROVERSY

ED. NOTE: The following piece on backstays by Sam Merrick was written with the intention of running it in the next REPORTER. Ten skippers were asked to provide their written reactions to these questions for publication:

1. *Your experience with respect to any phase of the backstay issue.*
2. *Your techniques in handling backstays - who does what and when, crew assignments, etc.*
3. *For those without backstays, how do you set up your boat to accomplish jib luff control as the wind velocity increases?*
4. *Your own suggestions as to where the class should go on the backstay question.*
5. *Your critical analysis of my analysis of the problem.*

The articles following constitute replies to these questions.

In a recent issue of NCESA REACHES, a question was put as to whether or not E-boats should or should not have backstays. I don't believe there is a case for their elimination. The compression involved on reaches is very heavy. . . heavier than the spar was designed to withstand without backstays. Not every mast so mistreated shows its agony with compression cracks, but enough do to make the point. And if the uppers are not "super-tight" and not also attached to chain plates in the after-most allowable position, the chances of trouble are increased. Moreover it is customary to have the mast more raked in the heavier air, so that uppers are likely not to be super-tight — even less tight if anchored to the chain plate in the aft position. Since we're about it, how about that aft position? Doesn't it complicate getting the mast to behave without a lot of stay-master adjustment to compensate any changes in rake? So, in my book, backstays are a necessary part of the rig as insurance against mistreatment of the mast.

When backstays came up for discussion at the 1988 NCESA Board meeting, the quite different uses, or non-uses, among leading boats was noted. For example, if Harry Melges was finding more upwind speed in heavy air by using muscle on a 4:1 backstay, how was Peter Fortenbaugh able to get comparable speed with no backstays at all? There can be no doubt that a tensioned backstay attached to the mast at the same level at which the headstay is also attached will determine tension on the jib luff — so what is the explanation of the two approaches and similar results?

We can agree that backstays are a nuisance - no more so than when disposing of the spinnaker at mark roundings. Hence the practice of uncoupling the tackle and taping the wire to the shrouds. Crews seem happier with their unencumbered freedom. They are more than nuisance when jibing in heavy air. Under these circumstances, they are a special distraction to the skipper trimming the mainsheet and steering the boat safely downwind. Failure to perform this accumulation of tasks easily translates into a quick swim. But because jibing without backstays in 20 knots is an invitation to mast destruction. I think we need them, nuisance or not. . . I am a victim to my own misfortune, so I know it will happen.

For many years, my practice was to rig the backstays on a 1:1 basis, eliminating the block and thus allowing a quicker operation. I also devised an arrangement which allowed a crew member not occupied with jibing to get the windward-to-be stay secure in its cam cleat from forward in the cockpit. I was thereby relieved of that task, so risk was reduced.

But 1:1 is no answer to using the backstay for making the headstay tighter — no answer for extending the wind velocity range of a jib which is full and needs a tighter luff. Less luff sag translates into a flat jib. That's where the new 4:1 mechanical advantage helps. If your crew is strong enough, applying backstay tension will make a significant gain in upwind boatspeed when the wind increases. If he or she is not strong, then geting the assistance of a second person is an option. Another is setting the backstay up before the tack. This makes some sense if you can mark the lines so as not to overdo the effort. How tight should the stay be set is something like asking how tight the mainsheet should be trimmed. The answer to both is dependent upon getting the best speed under the conditions of wind and water. I concede it is easier to fine tune mainsheet tension than a 4:1 backstay, but sail shape adjustments are the name of our game. My suggestion is to get a strong he or she on the backstay tail and cam cleats that release their grip when demand requires fine tuning.

One further note on this subject: the move to 4:1 from 2:1 made sense when it was approved by the mail ballot majority of our members, and still does. Before 4:1 was permitted, several boats had rearranged their backstay leads so as to be able to set up their 2:1 rig prior to tacking. Because this method to attain a tight headstay was therefore already available (and would have been, even with 1:1), there seemed to be no reason for preventing a more workable arrangment for accomplishing the same thing. Anyone advocating a return to 2:1 or 1:1 must answer this argument.

Reporter photo

RESPONSE

from Gordy Bowers. . .

The present controversy surrounding the 4:1 backstay as opposed to the tight shrouds and no backstay is an example of the strength of our scantlings. There seems to be advantages with both rigs. With time we will discover the disadvantages and change our rules; consequently, the E Scow will become a better and more popular boat.

The tight shroud and no backstay system could result in a simpler boat that is less expensive and has less windage. On the other hand, the extra loads may cause stress to the mast and hull and may result in a more rapid turnover of boats. Peter Commette dominated the East Coast E Scow racing ten years ago with a tight shroud rig. He stressed the boat to the point where the hull was pulled in around the chainplates. I thought it would cause hull failure, softness, and rapid obsolescence similar to the Olympic 470's. However, Peter sold the boat to Doug Love, who was fast for several years thereafter. So, maybe that says the hull will not soften and crack with repeated stress during racing, but who knows for sure, based on such a limited sample?

The last couple of years, the 4:1 backstay has been used by the leading racers in the ILYA with superior results relative to the two or one part backstay system. The 4:1 was allowed because racers using the 2:1 system were tensioning the leeward backstay before tacking to achieve a tighter headstay and flatter jib. I tried this many years ago and found to my distress that this caused the deck around the mast to depress significantly! Since then, the boats have been built stronger around the mast area and can withstand the compression.

The 4:1 rule allows a more refined approach to tensioning the jib luff. We can use varying degrees of backstay tension to change the entry characteristics of the jib and total amount of mast bend. In theory, we have a rig capable of more change to wind and wave conditions. As sailors, we have only begun to explore the possibilities of learning when and what to look for when adjusting the 4:1 backstay. Because the 4:1 system is endless, it is almost impossible to mark the backstays to reproduce tensions.

What we are left with is a combination of visual and "feel" indicators as to when and how much to tension the backstay. Windows in the mainsail luff together with marked spreaders allow you to view and monitor the jib leach. I used this method for the first time at last year's ILYA Regatta and found I had a lot to learn before I was comforable with this way of looking at the jib. You do not want to spend too much time looking aloft while all the real action is out in front of your boat. Secondly, you can steer to the luff shape changes as you power up or down with the 4:1 by looking at the response of your luff telltales. A loose backstay gives a wider groove between flow and stall while a tight backstay narrows the groove. You can also see the shape change by looking at the seams or draft stripes on the jib.

The better sailor you become, the more you will be able to "feel" the boat in response to adjustments to the 4:1. Does the boat flatten out and point higher when you tension the 4:1? Did you change the 4:1 in response to the wind velocity increasing or decreasing, or was the change made to accelerate while the wind velocity remained the same? Similarly, look for changes to the helm. You can also "feel" the boat's speed by listening to and observing the flow of water around the boat. Clearly, these are all skills we need to learn whether we use a 4:1 backstay or not. The 4:1, by making the boat more responsive can, with practice, make all of us better sailors who have more fun learning about our boats and sails.

Hopefully, with either the 4:1 or the high tension no backstay approach, we will get more E Scows and E Scow sailors out on the water enjoying the sport we all have grown to love.

Might be Gordy's backstay work? *Reporter photos*

RESPONSE

from Willie deCamp. . .

The question of backstay use or nonuse has been a tempest in our teapot ever since Peter Commette began experimentally sailing without them back in 1978. Indeed, as far back as Spring 1982, I related at some length in the REACHES my own shock at the discovery that backstays were perhaps not as essential as some of the nautical gods of my youth had led me to believe.

Last summer I crewed every weekend and at every major eastern regatta, plus the Nationals, FLACE and Blue Chip, each week on a different boat. I learned a lot about backstays.

My current opinions on the subject are these: (1) Backstays are deleterious to good crew work. (2) The fastest E Scows in the country today sail without backstays. (3) If you choose to rely on backstays when you tune your boat, it is very easy to create the illusion that they are essential to good boatspeed. (4) the structural problems associated with the nonuse of backstays are real but probably not insurmountable.

Backstays and Boathandling — The difference between crewing on a boat that does not have backstays and crewing on a boat that does have them could properly be compared to the difference between heaven and hell. The d*mn things are just always in the way! They droop on your shoulder, worm their tails down the bailers, distract your attention from important sail controls, catch on the spinnaker pole holder, and foul up the set. And how many races has each of us lost on account of the proverbial "backstay that didn't get released during a jibe"?

In an extreme case, I once saw a backstay destroy a mast at a Blue Chip Regatta when it got caught behind a spreader and started increasing the bending forces, rather than relieving them. Thus, from the standpoint of boathandling, backstays are a negative element with no redeeming features.

Backstays and Boatspeed — Properly tuned rigs without backstays are much faster than properly tuned rigs with them. I can hear scores of midwestern sailors groan as they read this, but it is true. The two fastest boats in the country by far at the moment belong to Peter Fortenbaugh and Scott Callahan, who sail *sans backstay*. The Melges, Porters and Wights only give them a good run for their money on account of their newer sails and greater regatta seasoning.

Crewing for Fortenbaugh or Callahan is an experience so uncanny it has to be experienced to be believed. Their rigs are very tight. They use extreme mainsheet tension and are very reluctant to ease the main. When small lulls hit, they don't bear off or ease sheets or heel the boat. They let the boat slow down a bit in exchange for keeping it pointing. Thus, when the next puff hits, the rig is already rock solid on account of stay tension and mainsheet tension. That's when they blow away the opposition.

Callahan's speed is a well kept secret because his sails are past their prime and because he had occasional trouble getting off the starting line. Nevertheless, in the six races at the Easterns there was not a single upwind leg on which a boat passed Scott Callahan. Peter Fortenbaugh, in my opinion, would have walked away with everything last summer if his older brother had not selfishly refused to teach him how to sail downwind.

In 1981 Willie had his backstay set up — but that was eight years ago.

WILLIE DE CAMP *(cont.)*

How to Create an Illusion — So why do so many top sailors insist on sailing with backstays? Aside from structural considerations, which I will address below, there are three main reasons. First, they tend to have more regatta experience, and so they often beat the nonbackstay crowd tactically. Second, although I have never sailed on an A Scow, I have heard that the "fine runner" backstay arrangement is of definite importance to boatspeed on A's. Thus, many sailors automatically assume that what is good for the A is good for the E.

A third reason a lot of good sailors go with backstays is that it is easy to wrongly convince oneself that backstays are the way to go. Here's how: (1) You understand the theoretical importance of controlling jibstay sag. (2) This theoretical understanding makes you determined to at least try sailing with backstays. (3) Therefore, you fail to tighten your rig the way nonbackstay sailors must. (4) at this point, you are trapped in illusion. Because of your loose rig, the backstays do become a critical tuning factor. Your rig is flopping around and you need backstays to control it. You see time after time that proper backstay tuning improves your speed. And so you become a believer.

But meanwhile, the whiz kids from Bay Head are already back at the East Dock drinking beer. They have traded jibstay sag control for rigidity of the rig.

If you consider the amount of fine tuning in the 4:1 arrangement that the midwesterners call the "fine runner", you will realize that it is not very great. It's a bear! After each tack, while the boats with backstays are yanking away to re-establish tension (assuming the middleman remembers!), the boats without backstays already have that tension and don't even have to think about it.

Two Words of Caution — One problem for those who sail without backstays is that the tight rig required in heavy air can ruin your boatspeed in light air. You have to loosen the rig in the light stuff. This means you have to be systematical about remembering numbers on the staymasters.

A second word of caution is that - if my memory is correct - Callahan and Fortenbaugh are both using the old method of supporting the spar, *i.e.*, their masts are held up by the jib halyard, not the forestay. Because the jib halyard runs through a sheave near the hounds and thence down to the foot of the mast, the load on their spars is distributed totally differently than that of their slower competitors. A word to the wise.

Stress on the Boat and Rig — The soundest argument for using backstays is that they keep various parts of the boat from being overstressed. Let's not forget that Scott Callahan almost lost the Nationals in 1985 because one of his shrouds broke. Moreover, the butt of a mast that is habitually highly compressed is not always pretty to look at. With all my enthusiasm for sailing without backstays, I must still confess to a little squeamishness about sailing without them in a big blow at Beach Haven or Oshkosh.

Nevertheless, given the proven boathandling and boatspeed superiority of the nonbackstay setup, we ought to be thinking about ways of strengthening the maststep area so that backstays are not structurally necessary. Three things come immediately to mind. (1) An obvious partial solution is moving the chainplates aft. (2) A stronger alloy or redesigned maststep fitting, if one exists, might also help. (3) Heavier gauge shrouds could be considered.

I believe that the class ought to change the scantlings so as to permit, but not require, chainplates to be further aft. This would permit all sailors to avail themselves of the increased simplicity, boatspeed and fun of sailing without backstays while reducing stress on equipment. The beauty of such a scantling change would be its voluntary aspect. No one would be forced to move their chainplates aft. Those who wished to continue to be slow by using backstays could still do so.

RESPONSE

from Dave Koch. . .

I am writing you to respond to your letter about E-scow backstays.

I think this is really a non-issue. Number one, the mast needs backstays to avoid de-masting the rig on a heavy air spinnaker reach. Also, the class just voted for the 4 to 1 three years ago, hence all the newer (last three years) boats are built with them on, plus most of the older ones have added them. I, for one, would be upset having spent money to convert my 1983 boat three years ago, only to have the rules committee change back to the original system.

If people want to sail without backstays, let them, because the rules now do not require them.

I think after a couple of masts break, the trend will stop.

RESPONSE

from Irv Spear. . .

I strongly favor the elimination of running backstays:

1. Most of our "modern" courses are sailed closer to the wind for greater speed downwind. This eliminates the large boom angles we used to use on dead downwind legs.
2. Less equipment (stays, four part line), lower cost to buyer.
3. Fewer tuning factors to simplify the rig, which might attract new members.
4. Eliminate the "peril" of not removing the backstay when tacking.
5. Closer to a "one design concept", achieving more equality.
6. One less thing to check to be certain the boat is ready to race.

After a lengthy search through our unorganized photo file, we finally came up with Irv. Spear in action, no luck with Dave Koch.

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RESPONSE

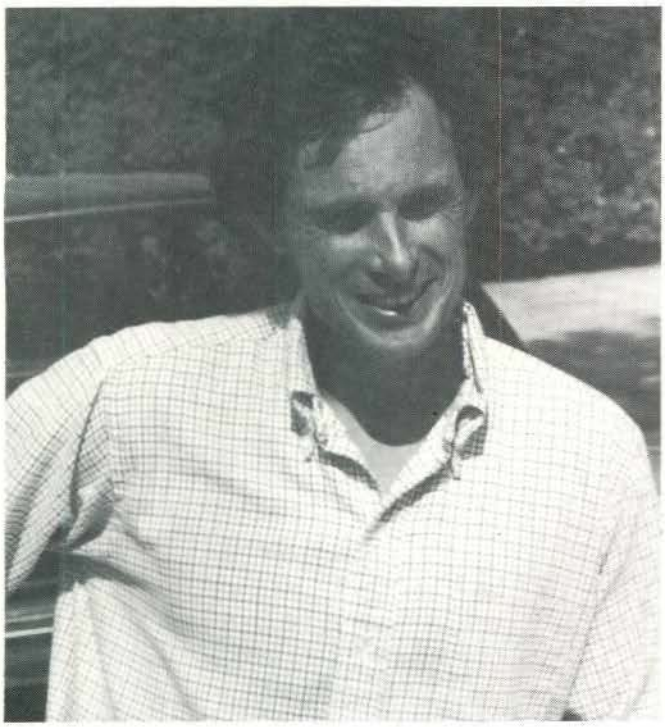
from Dick Wight. . .

I am in agreement with the conclusion reached by Sam in his article. I do not think we should remove backstays just to make the boat less sophisticated. If people do not want to use backstays, then that should be their prerogative. If enough people are competing successfully without backstays, then those of us who believe that they provide a margin of safety and give added flexibility in tuning will have second thoughts about our suppositions.

I understand that sailmakers cut a jib with the idea that it is to be set within a certain (small) range of sag. Too much sag results in a jib which is too full in front. This limits pointing ability. Too little sag will result in an overly flat entry. This tends to narrow the steering groove and make the boat point higher (and go slower) than the optimum pointing angle given all other circumstances. The fact that most jibs are cut to produce a given amount of sag is evident when you lay jibs of varying types on a lawn. The "hollow" is easy to pick up by placing a straight line from the tack of the jib to the head. As wind velocity increases, absent adjustment, there is a tendency for the jib luff (or head stay) to follow the apparent wind and be pulled back and to leeward which, of course, results in increased sag. If these assumptions are correct then it makes sense that differing amounts of pressure applied to the jib luff (or head stay) by way of the backstay will more nearly achieve the continuous and desired "correct" amount of jib luff sag than would be possible if no change is being made at all.

We have the "new" rig with a lever hooked up to the headstay which controls mast rake. The "old" rig has mast rake purchase hooked directly to the jib halyard. The headstay on the old rig is not used during a race except, perhaps, to induce jib luff sag in cases where you are caught with an overly tight rig. We tend to vary our upper stay tension considerably with either rig as we move from one race to another. By using the backstays, however, we can begin the race a little "softer" and thus achieve a wider range of jib luff tension in any given race than we could have achieved if we were not able to increase tension through backstay adjustment. Some may suggest that the required change in rig tension may be accomplished by adjustments to main sheet tension. This may be true (to some extent) but it is hard to argue against the point that backstays allow a wider range of jib luff sag adjustment. Generally, we first set the upper tension for the lightest expected first leg velocity with the mast at its most forward anticipated setting. This allows proper jib luff sag in the lighter expected condition. Next we set the spreaders while fiddling with the vang to get three to four inches of mast bend at the spreaders (depending upon luff curve in main sail) in the mid-range of the expected first leg velocity. That leaves the backstays as the fine tuning device for jib sag adjustment. In an expected light air race we pack the backstays away for convenience. The ability to start with a softer rig than we might otherwise have had to start with (absent the ability to adjust tension with backstays) is psychologically comforting to me. There are very few absolute statements I can make about tuning; however, I know that a rig that is too tight (over tensions and over straightens intended luff sag of jib) is slow. The symptoms are: (I) a too flat jib entry; (II) a very narrow steering groove; (III) boat wants to point but you are going so slow you cannot hold it up into the wind; (IV) to boot, the boat does not want to come off and go because there is no draft forward in the jib. Horrible!

CREW MANAGEMENT: The board man (second back) plays backstay tension as velocity changes much like he or she may change vang tension. The board man may occasionally call on the jib person for help. I like to have the crew think speed so the board person will call out changes in vang and backstay tension without prodding. Of course, if we are doing well my board person will be adjusting everything from bailer height to shoe lace tension. If we are doing lousy, he stares at his shoe tops and hums Talking Head tunes. So do I. That's life.



Skipper Wight as caught by Mike Heinrich

Bad side of team TA-TA.

RESPONSE

from Erik Johnson. . .

Once upon a time there was a twenty-year-old kid who saved all his money until he could afford to buy a good, used, E-scow. The kid took possession of his "new" boat in Columbia, SC; proudly raised his sails, and headed out onto Lake Murray in a 15 mph breeze. As he sailed across the lake, the wind built up to 25 mph and the skipper said cautiously to his crew, "I think we'd better go in now." Unfortunately, as they reached off, the pressure on the backstay popped the line out of the cleat and the mast folded like spaghetti. True story? Yes. The kid happened to be this writer, and I will never forget the helpless feelings that I had as I watched my mast fold in half.

So, what do I think about the backstay issue? As in life, as in marriage, there are two sides to every story, right? On the one hand, I feel confident that most skippers can visualize Harry sailing away from the fleet with Hans pulling the 4-to-1 through the deck (with those monster arms) and think that's the only way to go. But after having salt water splashed in my face for a full summer, I'd have to say that Callahan's and Fortenbaugh's speed (Peter, in this case. . .sorry, Mikey!) has certainly made a case for no backstays.

So what have Callahan and Fortenbaugh proven? They've proven that by moving their chain plates back to the legal limit and tightening their uppers that they can keep their masts upright and go fast too. I will add, however, that rumor has it that Scott has to reweld certain areas on his mast yearly and that Peter has stress fractures at the base of his mast from greater compression. Come to think of it, I always wondered what was under all that black gobbly-gook near Scott's spreaders. . .some sort of speed compound? And it goes without saying that the crew thinks it's great to not have a backstay in the spinnaker, or wrapped around their necks in a jibe, or tangled in the spinnaker sheets, etc.

But from a technical aspect, what are we doing? By moving the chain plates back, we change spreader angle, right? Big deal. Move your pins if you like this new angle. So I guess what I'm saying is that head stay sag is controlled by side stay tension, vang to a small degree and mainsheet tension.

Now, let's hear from the Republican side of the class. You know, the staid old farts whose conservative views won't allow them to give up the backstays that those young whippers tear off their boats. Hey, I voted for Bush and I bought into that 4- to-1 program. Harry says, "You finger tighten those uppers at 33'6" and straighten out that headstay with that 4-to-1 when the beef gets on the rail." You know, you leave the uppers loose and control everything with the backstay tension. Well, you forget, he's got the beef (Hans) and you don't; and he's got three National wins and you haven't (and it isn't because of any damn 4-to-1 sucker). But, as I said before, I used the 4-to-1 all summer with varying degrees of success and these are my thoughts:

First of all, I started out the season with my uppers fairly loose and found myself gradually tightening them up a little bit at a time. It seemed like every time we tightened them we got faster in light to medium air. Heavy air didn't seem to matter since we used the 4-to-1 as hard as possible and always seemed to have good speed. I would have to say that at the end of the season we were a "7" if "1" is loose and "10" is considered tight.

On what we felt was our slowest day, a 4-6 mph breeze, we felt we had too much jib sag and not enough air to really use the 4-to-1 effectively. We couldn't point and the boat seemed sluggish. We tightened the uppers and the boat came to life. I think that the jibs that we're using today are very sensitive in light air because they're so full, but the sailmakers continue to make jibs fuller every year. Personally, I think that the average guy is having more trouble fine tuning his rig because of the full jib and 4-to-1; however, I do think the class should keep the backstay and consider increasing the 4-to-1 to 8-to-1 for those who choose to use it.

photo: Fred Vullo

Crew seems reasonably content with lurking, vexacious backstay.

RESPONSE

from Bill Campbell. . .

It is my opinion that backstays are necessary on E-Scows more for structural integrity than for tuning and boatspeed, though a case can be made for either point of view.

On T-5 the backstays are set up with the coarse adjustment led forward of the skipper and the fine adjustment between second and third back. I always sail with four on board so this is convenient for the skipper and crew. Going to windward or before the start I consider the backstays of little importance, at this stage of development. Prior to the start they are a nuisance while maneuvering so third back takes care of keeping them out of my way.

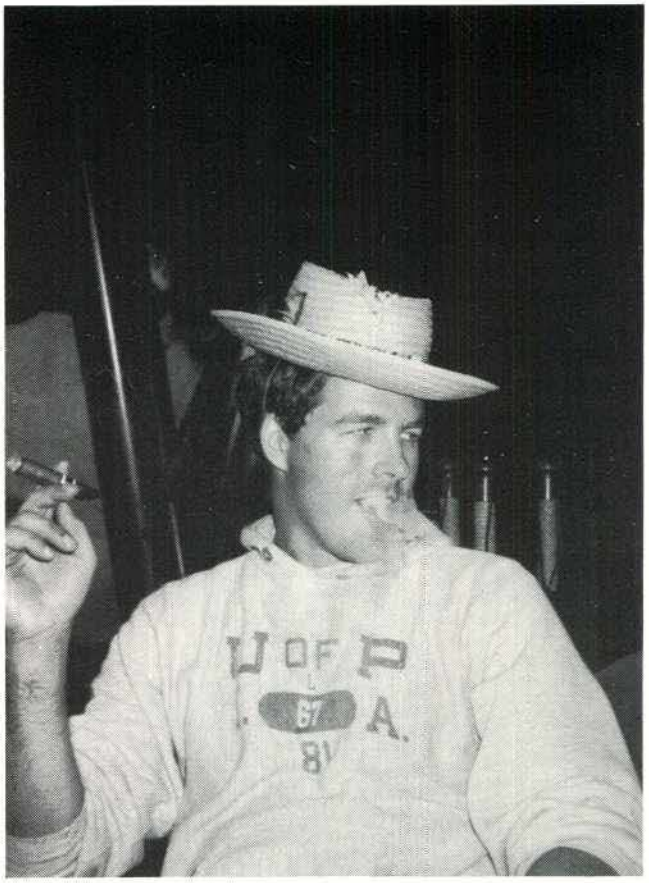
Going to weather, the mast is well supported by the rig without backstays. The 4:1 purchase to too little for any two of my crew to adjust except to pull it on prior to tacking. So we generally take up the slack and cleat them.

Backstays are most beneficial while reaching and running. When the backstays are on snuggly, and a puff hits the rig, the power from the puff will be transferred to the boat rather than the rig. The boat should pick up and go rather than having the rig surge over the side due to sidestay stretch and elongation of that support system. The backstays will hold the rig solid and the boat will perform better.

Structurally, it has to be better for the boat not being stretched and strained by the puffs. If you think not, ask Scott Callahan about annual rewarding at the hounds and his and Peter and Michael Fortenbaugh's mast butt problems.

If we are to go with adjustable backstays, let's go with enough purchase to make them truly adjustable. I do think that adjustable backstays can make a significant difference in headstay sag and therefore can make big changes in the shape of the jib. This makes the jibs usable over a much broader wind range.

A 4:1 system is not enough for my purposes. Let's make them usable for everyone.



Jay Darling is rumered to have said it's possible to blow smoke from both sides of the backstay issue.

Looks like Bill is smack in the middle of the makings of a great poker hand coming into the mark.

Reporter photo

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RESPONSE

from Harry Melges III. . .

I have sailed with backstays and I have sailed without backstays. After testing both methods I will take backstays any day over a boat without. Backstays add a sense of security to the rig. It's nice to be confident that you'll make it through an entire race without even considering a breakdown. In fact, in the five years I've been steering an E scow, we have never once had a breakdown, I guess that's part of our success.

4:1 backstays enable you to sail with virtually one jib and one sidestay setting for all conditions. When the puffs hit, you pull on the 4:1, this flattens the jib because you are straightening the forestay. This also holds the rig steady so when you ease the main in the puffs, the mast does not go forward and create headstay sag. The 4:1 backstay also makes the vang much more effective. Without backstays, when you apply the vang it bends the lower portion of the mast forward and actually loosens the forestay. With a firm 4:1, there is total control on forestay tension and jib shape.

In answer to techniques used in handling backstays:

0-8 mph — Backstays are detached, and then stuffed down the halyard openings on each side of the mast and taped alongside the mast.

10-30 mph — 4 crew members = 4th crew does backstay on the tacks and jibes. 3 crew members = Skipper does backstays on the tacks and jibes, middle person controls 4:1 with the help of the jib person in the really strong puffs. Pull it in the puffs (when overpowered). Ease it in the lulls (when underpowered). The windier it is, the harder you pull, remembering to ease it when underpowered on the tacks and when rounding the windward mark. Ignore the 4:1 on the downwind legs but remember the backstays!

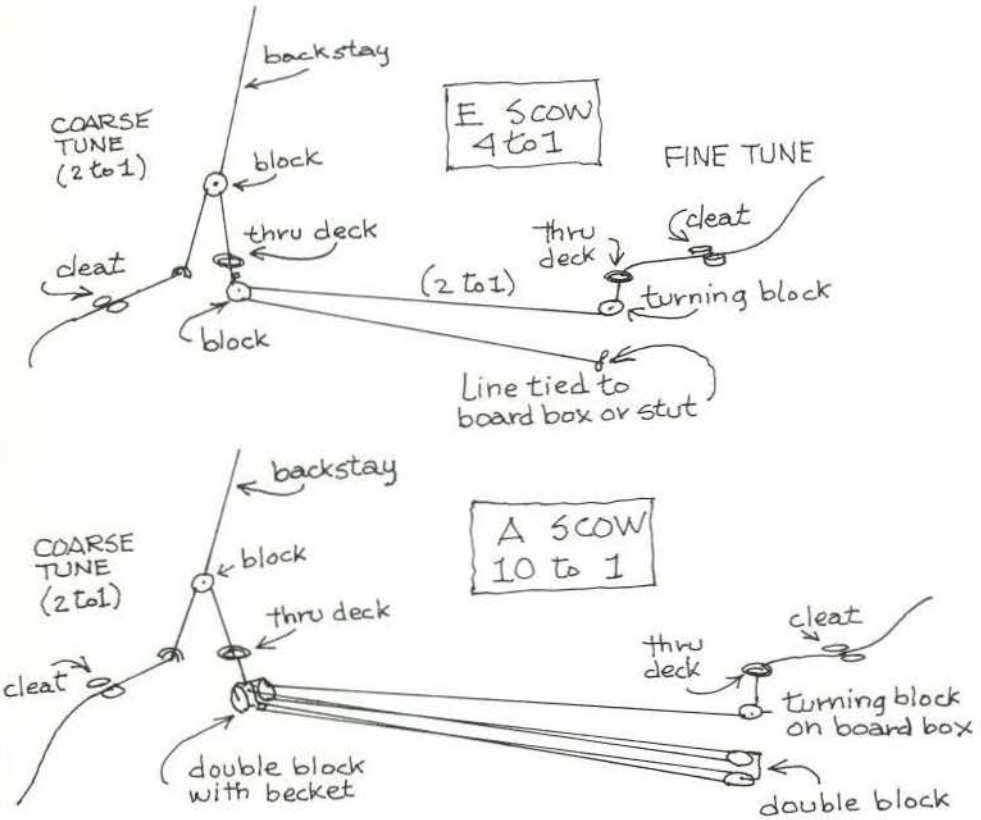
The only way to accomplish proper headstay sag without backstays is to constantly adjust sidestay tension. And, it becomes more critical to have the proper jib up because you are very limited to any adjustability in the puffs. Basically, in light air you must have loose sidestays, and as the wind increases you must gradually increase sidestay tension so that they are extremely tight in heavy air.

What's wrong with the present rule? Nothing, as far as I can see. Those who don't want to use backstays don't have to, and those of us who do use backstays, can. That's great! Some people complain about muscle on the 4:1. . . well, why not allow another purchase and eliminate that factor? Just a thought! I like it the way it is, it keeps my crew in shape. After all, that's what the sport is all about. It is hard work when it's windy and it always will be a challenge. Take away the challenge and you'll take away the appeal.

In my opinion, 4:1 backstays are without question faster in heavy air. It's been proven time and time again. Sam makes some very good points in what he has written and everything makes good sense.

Our attitude towards backstays is that they are an advantage instead of a nuisance. In light air, they aren't needed, so we can detach them. The exception is that in really wavey conditions, they can be used downwind to snug up the rig so it doesn't bounce around in the waves.

In any kind of breeze, they make for a very adjustable arrangement. Upwind they give you the most flexible setup available on an E scow. Downwind, especially in heavy air, the backstay can be an aid in jibing; especially with 3 crew members. Instead of using the mainsheet to jibe the boom, the skipper or 4th crew can use the leeward backstay to pull the boom across and then immediately release the other backstay. This is a very safe and effective way to jibe.



Ed. Note:

Since some E sailors have expressed interest in upping the 4 to 1 backstay purchase to 8 to 1 or beyond, we thought this was an appropriate spot to show a schematic comparison of the current E scow 4 to 1 with the A scow 10 to 1 arrangement. (Remember - what's easy to pull in is usually tough to let out.)

RESPONSE

from Peter Fortenbaugh. . .

I have read your article and written some comments in response. I appreciate your belief that I might be able to contribute something to this whole debate. After being in charge of a boat for only one season, my opinions are not definite, but I offer my observations for what they are worth:

The overall feeling on BH-13 about backstays is that they are not necessary. However, it must be noted that we have less experience racing E Scows than most members of the class and that the following observations come from just one season. That aside, this past season has reinforced our opinion with respect to backstays and speed, but it has left us concerned about the safety and durability of a mast.

We feel it has been made very clear that backstays do not give a real speed advantage. Perhaps in radically changing conditions backstays do offer more flexibility, but in the racing conditions of this past year, the fastest boats had both rigs. Boat speed is a function of hundreds of variables, and if backstays do matter at all, then their relative importance is insignificant compared to the other factors. This is the primary reason why we chose to remove ours and race without them. As a new team, we had enough other things to worry about during a race and felt backstays would distract us from concentrating on the variables which are highly significant (such as vang, traveler, jib car, etc.). Sam acknowledges that "backstays are a nuisance" and that "crews seem happier with their unencumbered freedom." This is a very important observation and is often under-emphasized. If crews are unhappy and encumbered with backstays, they cannot concentrate as efficiently on the more important variables, which do win races.

On the other hand, I am concerned about what we are doing to the mast and what safety risks we are taking by not using backstays. We have one of the masts suffering from what Sam refers to as "compression cracks". These were a source of much attention last summer and almost caused us to drop out of a race. However, is it clear that they are a direct, or even indirect, result of not using backstays? If so, then by racing without the stays we may be acting very foolishly, if not negligently. Another source of concern is large waves, especially while towing. I have often been convinced that the hull was going to shatter when banging up and down on waves and wished I could secure the mast as much as possible. In terms of speed, the only time I wished we had backstays was during a very windy tight reach with no spinnaker one BBYRA race. (Note: this might sound like a silly point of sail to racers not familiar with BBYRA racing, but such legs are quite the norm.) The mast was shaking and the jib luff sagged continuously. However, this might have been corrected with the proper vang tension, and I believe all official regatta courses are supposed to be void of such legs.

I feel the current NCESA policy on backstays is good and that they should remain optional. There is certainly no reason to make them illegal. However, should it become clear that racing without backstays presents a danger to the crew on the boat or to competitors within a mast-length distance to leeward, then action to make backstays mandatory would be in order. In the meantime, we will continue focusing our attention on the other controls which have a greater effect on speed. Sam mentions the possibility of backstays resulting in a "quick swim." Well, as our fellow Barnaget Bay racers know, we took more than our share of quick swims last year without the help of backstays. Were we to use them, I would have to trade my Aigles for a pair of flippers!

AHA! Truth will out!
No backstays simply provide better E Scow fishing as demonstrated by brother Mike.

photo: Fred Vullo

- - Nary a trace of one.

RESPONSE

from Ted Beier

You're sailing a little higher than you want on a run to keep a competitor off your weather quarter. The wind is around twenty with a heavy chop, and your boat is not rigged for backstays. Fifty yards from the mark you bear away to lay the mark on a run. While preparing to drop the chute, the bow digs into a wave, the boat slows, and the mast folds forward just above the spreaders. What happened?

Your mast failed because of excessive column load. A large compressive or column load put on a slender beam will cause little deflection as long as the beam remains straight; *Figure 1 (a)*. However, if the center is pushed out of alignment, or as is said, the beam does not "stay in column", *(b)* its strength is reduced. If the load is too great, the bend increases until the beam fails in the center, *(c)*. Actually, the main job of the lower stays is to keep the mast in column under heavy side loads when going upwind. The lowers must be initially slack to match the stretch of the uppers, and become taut after the proper mast deflection to keep it straight. This slack will not be correct for the deflection of the mast under a forward load. Therefore, the lowers do not help keep the mast in column. Lower stays actually hinder in our example. There is a formula to calculate the allowable column load for a beam.

Another necessary concept is the relation of mast and stay loads to the applied loads. Consider a simple mast with a single stay as shown in *Figure 2*. A load perpendicular to the mast (F = 100 lb.), will result in a column load in the mast, *C*, and a tension load, *T*, in the stay. The size of the column and tension loads depends on the angle of the stay with the deck, *A*. For an upper, the angle to be considered is the angle of stay and spreader. As shown in *Figure 3*, these loads increase rapidly as the angle gets larger. Note that the horizontal scale in the figure does not run to zero.

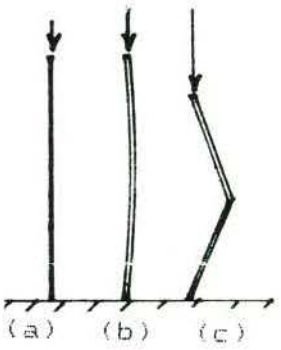


Figure 1

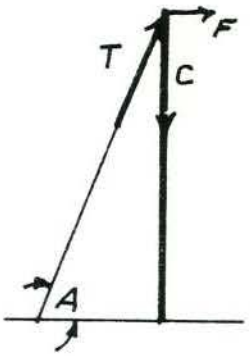
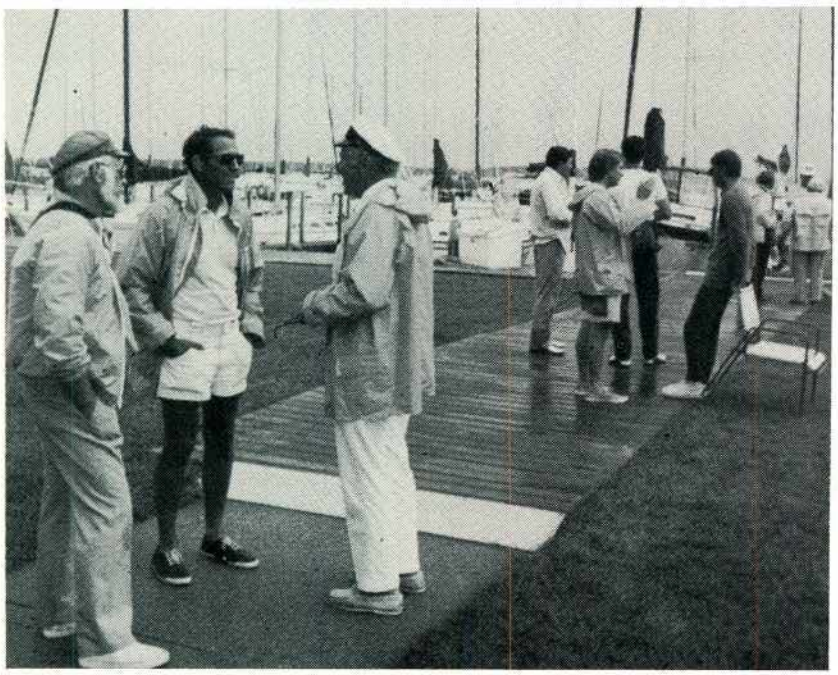


Figure 2

Reporter photo



L.R. Ted Beier, Bunny Kuller and Walt Smedley in a dockside "Think Tank" session about flotation and backstays at Muskegon a couple of years ago.

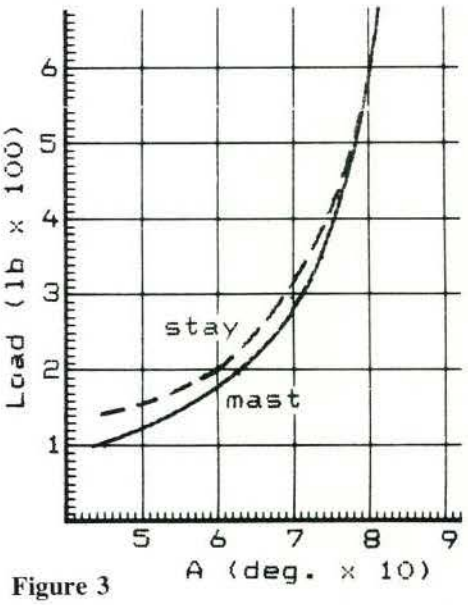


Figure 3

In applying these concepts to a mast, the critical case involves sailing downwind because the loads from the sails are acting directly forward. The angle for a backstay is 67 degrees, and for an upper is 78-80 degrees. Hence, the load carried by a backstay instead of an upper stay will result in less column load on the mast, provided the backstay is stiff enough. With the trend to more slender masts on our boats, the sensitivity to column loads and the need to keep the mast straight becomes greater. Moving the deck attach point of the upper stay aft will not achieve the same results unless the spreaders are lengthened also. Even then, the angle won't be improved by more than 2 degrees or so.

To examine the more complex problem of an E Scow rig going downwind, a type of computer program, called a finite element model, was developed to calculate the loads. A wind speed of 20 kt and an allowable column load of 2950 lb. were assumed. Two rigs were examined, defined herein as *A* and *B*, with properties as shown in *Table 1*. For some of the calculations, Rig A only was considered to carry a backstay.

Table I

Item	Rig A	Rig B
Upper stay aft of mast line (in.)	13	18
Upper stay diameter (in.)	5/32	5/32
Spreader length (in.)	23	35
Backstay diameter (in., when used)	1/8	none
Rake at no stay tension	33-6	33-6
Rake during operation	33-9	33-9
Mast compression preload (lb.)	430	570
Upper stay tension preload (lb.)	185	240
Backstay preload, after gybe (lb.)	50	none

Figures 4 and 5 are plots of the results for Rig A, with and without a backstay, and Rig B without a backstay only. The loads are plotted against a speed in knots which is the difference between true wind speed and boat sped. The message in these calculations is quite clear.

Figure 4 shows mast column loads for the three setups. The maximum safe column load of 2950 lb. is indicated also. For Rig A (which is about the current standard) without a backstay, the spar is in danger of collapse for a relative speed of 11 kt or greater. Moving the uppers aft and lengthening the spreaders (Rig B) yields little improvement. The limiting column load is reached at a relative speed of 13 kt. Rig A with a backstay can stop completely in a 20 kt wind and remain intact with a column load of 2320 lb., or 79% of allowable.

The stay tension loads in Figure 5 show a similar trend, although the allowable cable load for 5/32 1x19 cable of 3300 lb. is not exceeded prior to column failure of the mast. The largest backstay load is 1210 lb., which is 61% of the allowable for 1/8 1x19 cable.

Perhaps you can survive without backstays, if you never sail directly downwind in heavy conditions, and if you never get slowed down by a wave. However, a structural engineer or your insurance carrier won't like the odds. I feel that backstays are necessary. They provide the strength margin that guarantees the survival of your spar. Further, I think that we should make their incorporation into all boats mandatory without regard to the question of their value for tensioning the jib luff.

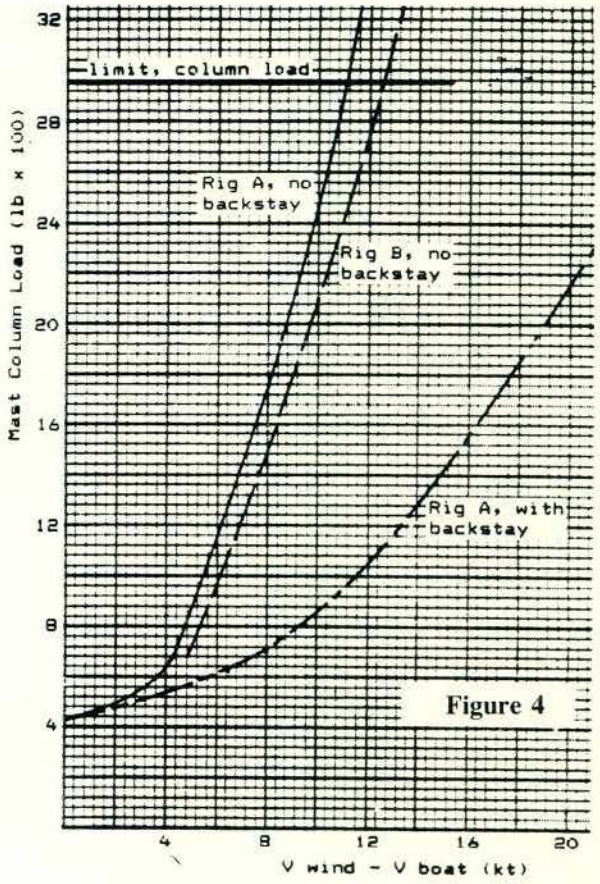


Figure 4

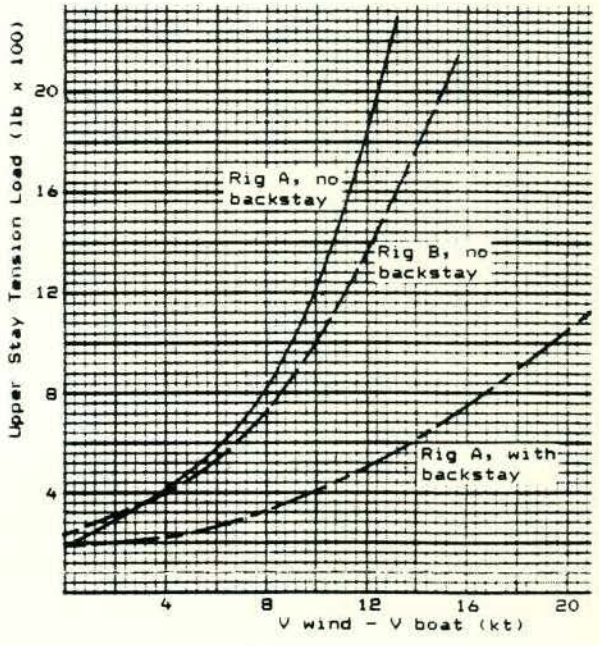


Figure 5

FROM THE ARCHIVES

Ed. Note: *Starling Burgers designed this scow sloop OUTLOOK in 1902. She was designed to the existing cubical contents rule which placed an emphasis on low freeboard and light displacement resulting in the skimming-dish yacht. OUTLOOK was designed to defend the Quincy Yacht Club Challenge Cup under a rule which required only that the water line length should not exceed 21'-0''. OUTLOOK'S dimensions were LOA 52'-7'', LWL 20'-10'', beam 16'-0'', draft of hull 0'-8'', least freeboard 0'-13'', area mainsail 1,410 sq. ft.; area jib 390 sq. ft.; total sail area 1,800 sq. ft. When heeled on the wind she more than doubles her waterline length. The large structural steel truss gave her crew of five fits when climbing over it. OUTLOOK'S racing record was seven starts and seven firsts after which the waterline length rule was buried and she was retired.*
(Above copy based on a 1986 WOODENBOAT artice by Llewellyn Howland.)
The REPORTER welcomes comment and analysis of OUTLOOK'S backstay arrangement as shown in the accompanying photo. (Note single, small spreader.)

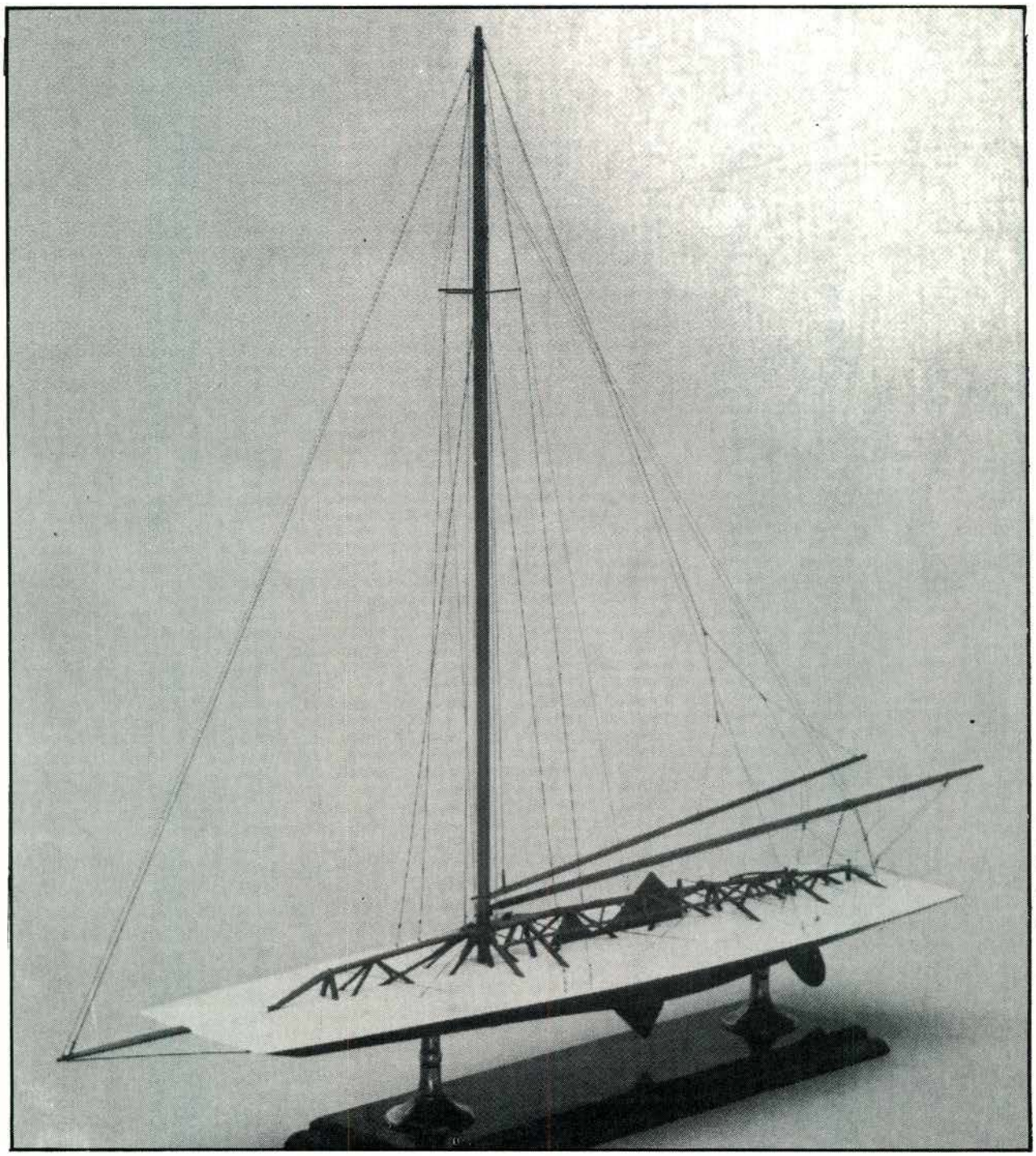


Photo: National Maritime Museum, London, England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1989 WOODIE WORLD'S WRAP UP

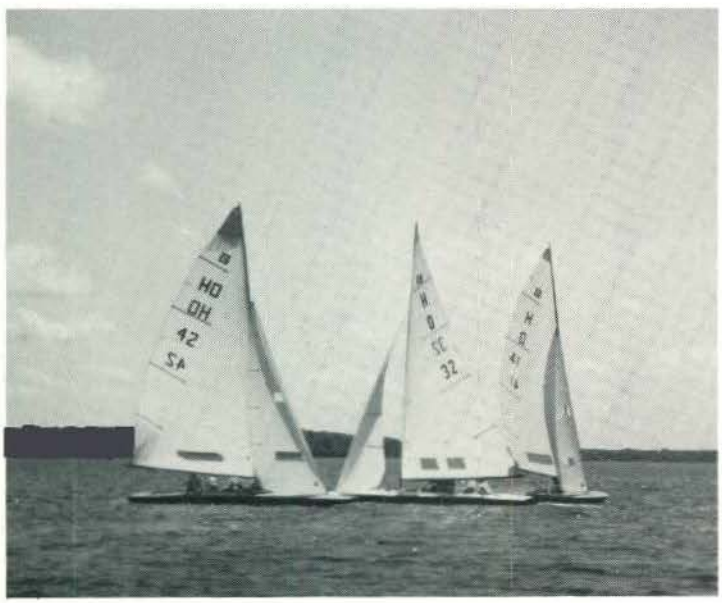
by Brian Haumersen

The fifth annual Wooden Scow worlds were held on May 6th and 7th on the Miles River in St. Michaels, Maryland. Skies were sunny and the temperature stayed in the high 70's.

For the first time in the history of the event, Race #1 began within an hour of the scheduled start. The race was an up-river, point to point sailed in a 10 knot wind. The starting line was set just off the Miles River Yacht Club by Grant Lennox, Chairman of the Race Committee. The finish line was located four miles up river on the dock of Mr. and Mrs. William Storey. Dean Lennox of Lake Hopatcong, New Jersey finished first followed by Brian Haumersen, also of Lake Hopatcong - a hotbed of wooden scow racing. Tom Storey of Herndon, Virginia was third.

Race #2 featured the return of the "Round The Island" course. Given the option of circling the island clockwise or counterclockwise, the fleet split immediately after the downwind start. To no one's surprise, Lennox chose to go counterclockwise while the rest of the fleet went clockwise. With a significant lead, Lennox headed off on a bird spotting expedition, soon finding his boat aground in ankle deep water. By the time he and his crew had dug their boards out of the mud, Haumersen, with Bill Storey's "Post No Bills" in hot pursuit had crossed the line, also trailing mud from numeroous groundings.

Race #3, The Kentucky Derby, was won by Sunday Silence. Betting was heavier that usual, perhaps due to mint juleps and "Dicksters"...



A bit of psyching before the bell?

First race - Lennox leads Haumersen and Storey up the Miles River.

Is Tom catching Bill ? or is Bill leaving Tom ? or should these photos be switched?

WOODIE WORLD'S

Sunday morning was anything but silent, and we were reminded why wood is good. One of the RC boats, of fiberglass construction, sank during a squall overnight. Two vintage woodies moored nearby faired much better. Given the sunken RC boat and high winds, everybody said the heck with it, ate lunch and set about to determine a tie breaking procedure for the first four boats. After a lot of head scratching, local log canoe pilot, Bill Hanlon, suggested a system used by canoers - chug for glory.

With the 24 oz. no spill rule in effect, Bill Storey horizoned Tom Storey for third. In a markedly slower-paced race, Brian Haumersen beat Dean Lennox for first place overall.

All in all, it was once again a beautiful weekend on the Eastern Shore and special thanks go to The Miles River yacht Club, The Storey Family, Spicer's Seafood (host for Saturday evening banquet) and Grant Lennox.

The 1990 Woodies will again be sailed on Kentucky Derby weekend on the Miles River, or perhaps on the Choptank River in Cambridge. Plastic boat skippers should stay tuned.

A shameless attempt to win the Baumann Memorial Crew Trophy.

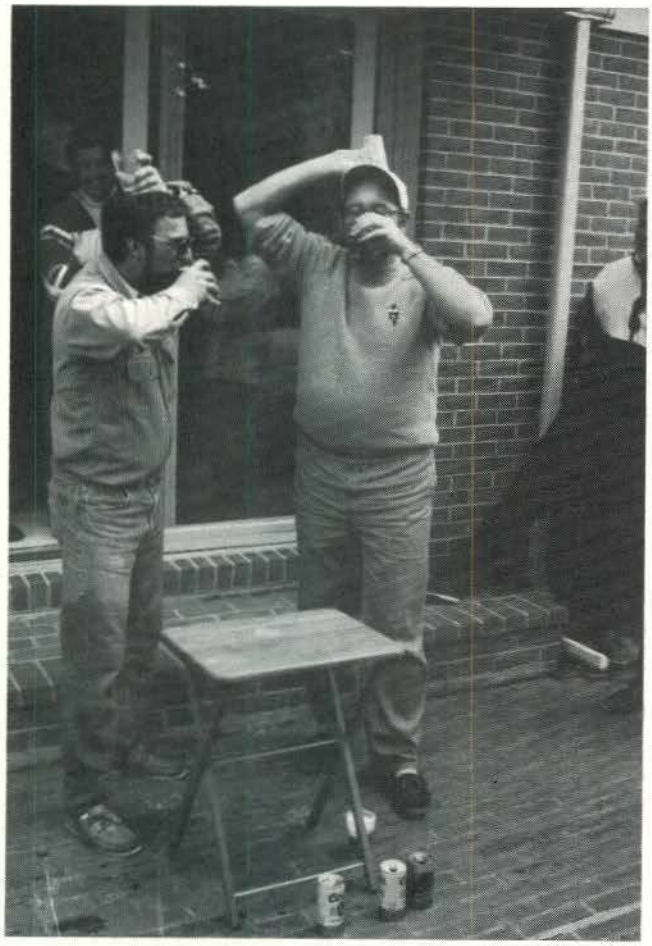
A spinnaker was bravely flown.

Bill Storey bottom fishing for mud?

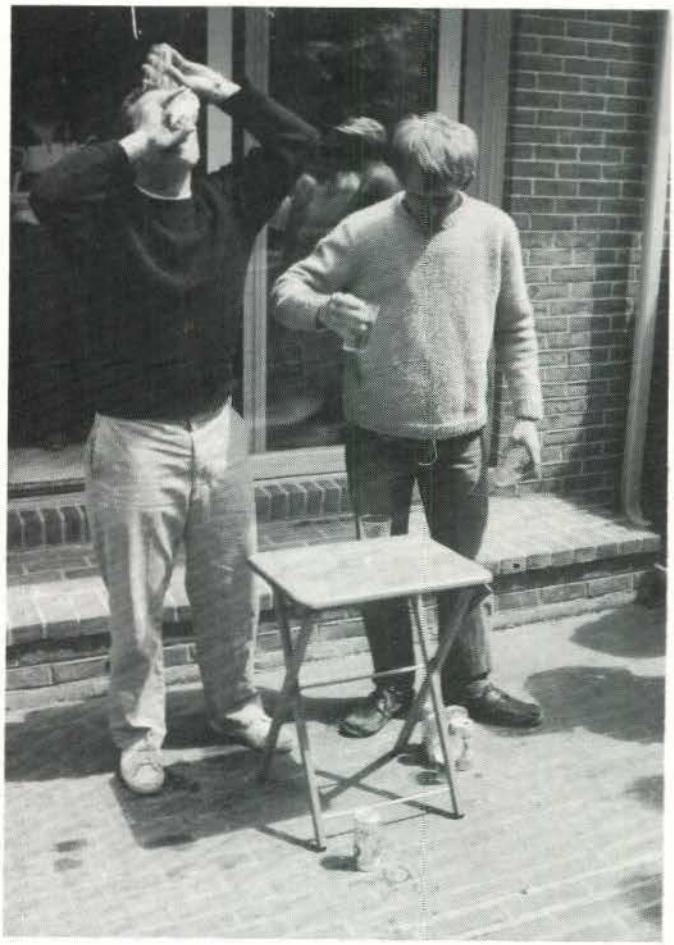
Mayfly problems.

WOODIE WORLD'S

A familiar scene in the pits at the Woodies.



Tiebreaker for third - Tom Storey (l.) buried by brother Bill Storey (r.)



Tiebreaker for first. Haumersen (l.) cruises past Lennox (r.)

1989 WOODIE RESULTS
St. Michaels, Maryland

First Place	Brian Haumersen	'71 Melges
Second Place	Dean Lennox	'72 Melges
Third Place	Bill Storey	'65 Melges
Fourth Place	Tom Storey	'70 Melges

Thomas M. Baumann Memorial Crew Trophy
Specially Awarded to Grant Lennox

Skippers, crew and fans of the 1989 Woodies.

oin the Melges Team

1989 Spring Results

Black Tie 1st
Nagawicka 1st
Springfield 1st

YOUR BEST CHOICE FOR SEVERAL REASONS:

Dedication: At Melges, we're very dedicated to the E Class, helping it to be one of the best classes in the world.

Consistency: We take pride in our quality control. We guarantee your sail to be exactly the same as the National Champions.

Service: Our company was built on service. We attempt to have a highly qualified person at every regatta, to assist our customers and answer their questions.

Performance: **Melges sails and boats continue to dominate the E Scow circuit, and 1989 will prove to be even better.**

1988 REGATTA RESULTS

Nationals 1st
Inland 1st
Easterns 1st
Blue Chip ..... 8 out of top ten boats
Western Michigan 1st
MESA 1st
Wawasee Open 1st
Keuka-Chautauqua 1st
Down Bay 1st

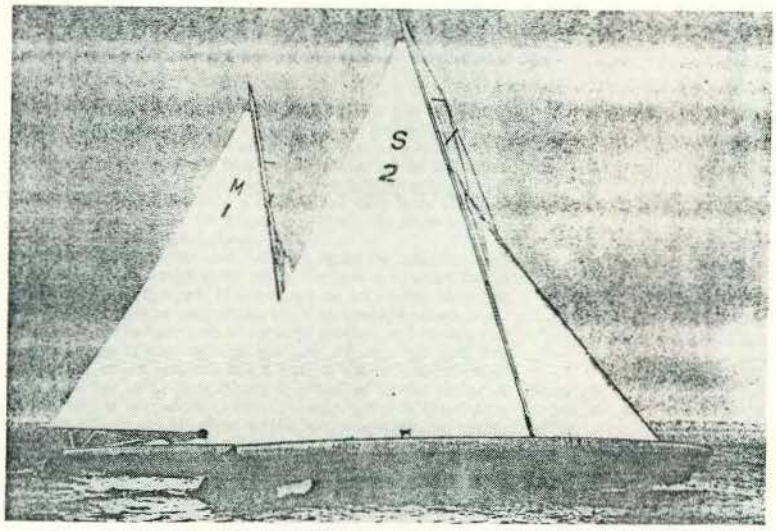
From the ARCHIVES

ED. NOTE: (by Sam Merrick) The following piece, which appeared in YACHTING, was written by Slade Dale in 1926 and qualifies as a gem of wisdom on sailing an E-boat. Dale has every right to be termed Barnegat Bay's outstanding racing helmsman during a racing career which he concluded in 1932 when he was 30 by deciding there were just too many other things for his boating intentions than chasing his friends around buoys.

Those of us who are racing buffs must excuse Dale for deserting our ranks — particularly when he so successfully manages to put into words the essence of sailing our boats.

He talks of a time before vangs or parachute spinnakers and when a beam reach was top speed. So, his vision was circumscribed. But his grasp of the sensitivity which alone makes for top performance on the windward leg is a lesson to us all who try to emulate our experts by adopting their suggestions but have not their sensitivities.

Dale won his first E-boat championship in 1925, the year Al Gallun and John Pritzlaff won the first E Inland Regatta. Too bad they never met!



Racing Class E Inland Lake scows on Barnegat Bay.
They are the most sensitive racing craft afloat.

Sailing an Inland Lake Scow

A Brief Discussion of Their Peculiarities and the Factors Which Make Them the Fastest and Most Sensitive Racing Craft Afloat

By F. Slade Dale

ALTHOUGH it would be hard to draw accurate lines of distinction between all of the various classes of racing craft, it is safe to say that as a type the light, sensitive, jib-and-mainsail racing scow occupies a place in the sport peculiar to itself. Bordering on the freak, or racing machine type, the Inland Lakes scow furnishes an excellent example of the delicate type of racing craft which makes such a strong appeal to a large number of yachtsmen.

When you step aboard a 28-ft. Class E scow for the first time its flightiness is a revelation; it has the acceleration of an iceboat, and when it spins about in the space of three seconds or so, the stranger must watch his balance. Also, when it starts planing in a good breeze its speed of from 14 to 17 miles an hour means that a real thrill awaits the man accustomed to keel boats who has done all his sailing with a sluggish chunk of lead under him.

Scows have been used on the Inland Lakes of Minnesota and Wisconsin, and on Lake St. Louis, Canada, for many years, but until their introduction last summer on Barnegat Bay they were comparatively unknown to eastern yachtsmen. Thus far, with but a single racing season behind them, Barnegat's skippers still look upon the intricacies of scow-sailing as a matter requiring much study. And this article pretends only to set forth the impressions which a year's racing has made upon one accustomed to the cat-rigged sneakbox, rather than to discuss the scow with the authority of one long familiar with the type.

When the nine Class E scows arrived from Oshkosh last year their invasion of the domain of the sneakbox was looked upon largely as an experiment of doubtful success. The type of modern 20-ft. racing sneakbox, designed by Mower in 1914 and now carrying the Marconi rig, has long been considered the fastest 20-ft. boat in the world; with its 33-ft. mast and 430 sq. ft. of sail it is a thrilling sort of racing craft itself, and in its home waters had so endeared itself to racing men that it appeared to be the one class which would always enjoy a foremost place in New Jersey's yachting activities. Thus it may be seen that when the scow came along it needed more than ordinary merit to find a permanent place for itself in the schedule of the Barnegat Bay Yacht Racing Association.

Factors which arise in sailing the scow are so interwoven with, and dependent upon, the peculiarities of the type that a brief discussion of a typical design should be given first consideration. It may be said that for shoal, smooth-water sailing the scow has all the attributes of speed. With an overall length of 28 feet it has a fine, easy

entrance and a clean run, both of which are necessarily abbreviated in the shorter 20-ft. sneakbox. Beam is limited to a maximum of 6 ft. 9 in., but the sail plan of only 285 sq. ft. makes it an easy matter for a crew totalling the maximum allowable weight of 550 lbs. to carry full sail in even a stiff breeze.

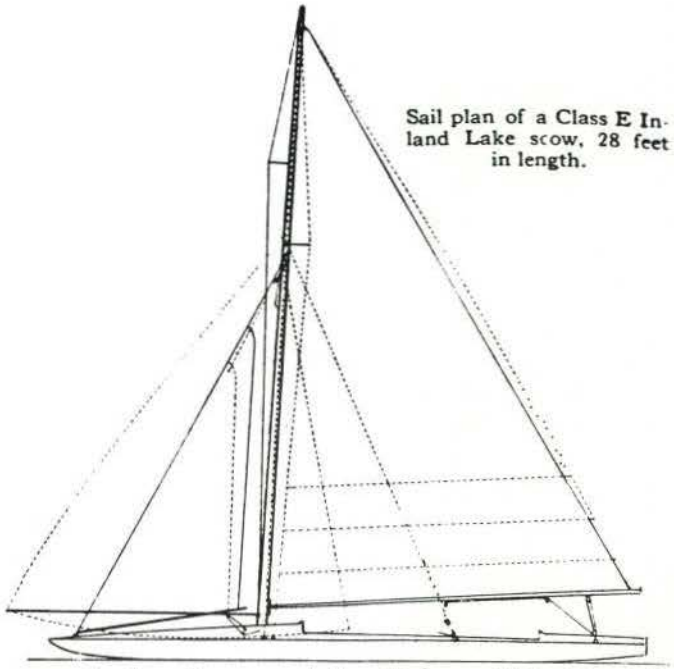
In plan, the stern is square and the broad bow is a flattened curve — only one of the boats on Barnegat is of the "pointed bow" type. In profile the sheer is straight; the rocker of the keel forward of amidships is only 8½ in. in 12 ft., and aft it is the same in 14 ft. Freeboard is about 12 inches. With such slight rocker to the keel, and with a flat floor, the diagonals and buttocks are quite straight and, when heeled, the actual waterline is a long smooth curve on both sides, with but little distortion. There are no reverse curves in profile, such as have marked scows designed to reduce their waterline measurement.

Two bilgeboards and two rudders set at an angle of about sixteen degrees contribute to an efficient sailing form when the boat is heeled, although factors such as wind and sea, wetted surface and weight of crew largely determine whether or not the hull shall be kept heeled to the point which puts the boards and rudders in a vertical plane. The area of each bilgeboard below the bottom of the boat is about 6.5 sq. ft. and of each rudder about 1.5 sq. ft. Incidentally these areas are in the same ratio to the scow's sail area as the board and rudder of the sneakbox are to its sail area, and considering the finer degree of balance which the scow's rig and its easy lines afford it would appear that for most conditions the scow is oversupplied with lateral plane.

The straight sides and full ends make for stability, and even in models with slack bilges the power to carry sail is not unduly impaired. Heeled over on its sailing lines the scow is in effect a long, straight-lined, round-bottom boat, offering little resistance to forward motion and having the advantage of the righting moment of the hull and live ballast, which remains lifted out of water to windward. No matter what importance is attached to the shape of the bilge it is probable that a greater factor in the design is the amount of lift given to the bow and stern, for unless the keel is rockered just the right amount the ends will either not come down to the water on the proper sailing lines or will be submerged too heavily and cause the boat to "stick" in her movements — as is the case when overloaded with ballast.

It is in sailing to windward that the extreme sensitiveness of the scow comes to light. A fine degree of balance attained in the proper manner is essential for speed to windward, and only the man at the tiller can judge whether or not his boat is "right" in this important respect. And balance in the scow is elusive; it frequently vanishes between one tack and another, sometimes returning of its own accord and at other times only after extreme measures on the part of the skipper. A slight change in the strength of the wind or in the form of the sea, an unconscious shifting of live weight, or some alteration in the position of the boards or the trim of a sail — any one of these is enough to throw the boat out of balance, but the very sensitiveness which makes the boat susceptible to such influences makes it easy for the helmsman to detect that something is wrong.

If it were only a matter of correcting a lee or a weather helm to restore proper balance, once it is lost, the skipper's task would be an easy one; but in order not to sacrifice speed he must not only restore fine balance but he must restore it through such an arrangement of all his variable factors as will result in the fastest racing combination. Moving the jibsheet man forward two feet may have the same effect on lateral resistance as dropping the bilge board two inches lower, but if the boat happened to be already on her best sailing lines it might be disastrous

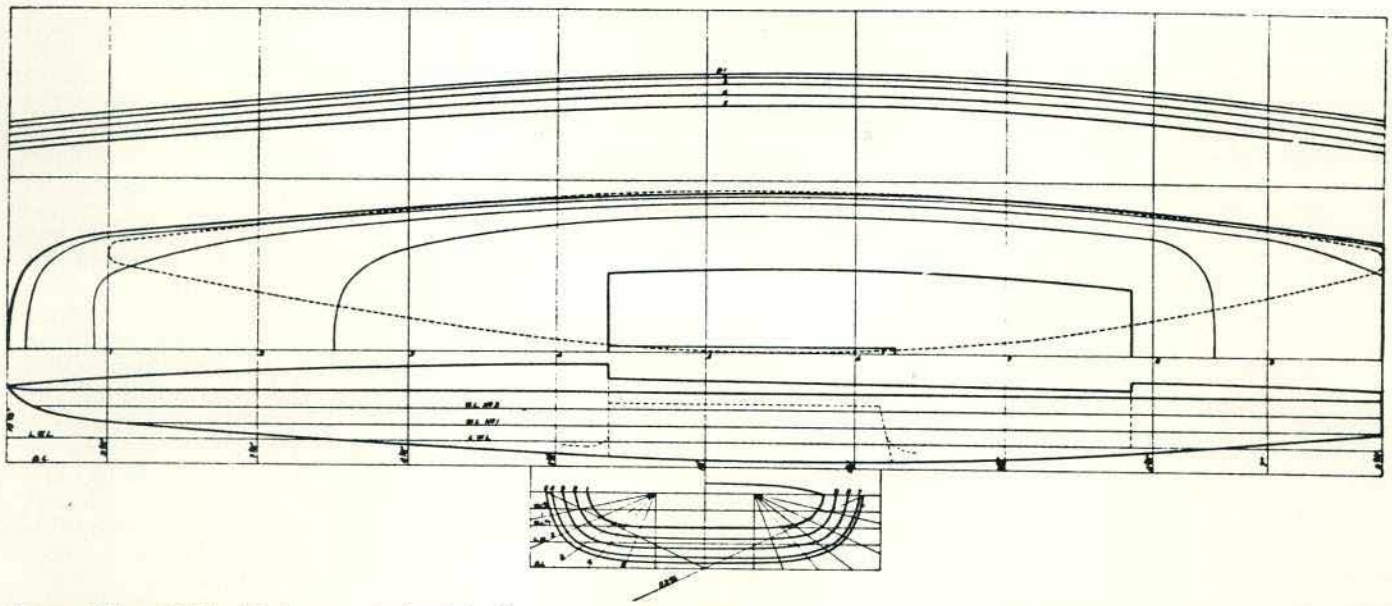


Sail plan of a Class E Inland Lake scow, 28 feet in length.

to put the bow lower, and the skipper might choose to make his adjustment with the board, and accept the increased frictional resistance as the lesser evil. Or he might ignore the lateral resistance and get the same result, as far as balance is concerned, by easing the jibsheet and causing the center of effort to move aft; in other cases he might even send a man to the forestay turnbuckle to alter the rake of the mast. Thus, there are many factors to be considered in their relation to a proper balance of the boat, but vital as that matter is, it is not the whole secret of speed by any means and the skipper can not afford to lose sight of the multitudinous little details which, in the aggregate, may mean the difference between winning and losing.

Take for example the apparently simple operation of going about. An E scow can be put about in 3 seconds, although it is doubtful if anything is gained in a race by doing it in less than 5 or 5½ seconds. But aside from the element of time the skipper can influence the action of his boat by the manner in which he distributes his crew; if the live ballast is all centered amidships the hull can be spun around with appreciably greater acceleration than if the weight is placed on the extremities of the boat, where the inertia of the mass would have a dampening effect on the turning speed. Obviously the effect of moving the crew to the extremities of the deck would be negligible in a heavy boat or in a slow turning one, but in the light scows hardly a move can be made without having a noticeable effect — and perhaps that largely explains the fascination of racing them.

The skipper who can develop a really sensitive "feel" of his scow — to a degree not possible with most types of racing boat — has an asset not approached by even the greatest expertness in sailing by the fly or thread on the rigging; he is a step beyond, and is not impelled into working the tiller excessively in a vain effort to take advantage of passing fluctuations in the belief that each is a steady, favorable slant of wind. Rather he is guided by the action of the boat as a whole, and with but occasional glances at the sails he can tell instinctively how his boat is behaving. It is true that the helmsman unconsciously gains impressions from general conditions, and when he prefers to avoid wearing a hat the better to feel the wind on his face, it may be assumed that a few bits of thread here and there on the rigging may also assist him in a general way, and perhaps cultivate an artificial alertness. In that sense such wind indicators may begin to serve the



Lines of Class E Inland Lake scow, designed by Jones and LaBorde. A study of these lines show why the scow is the fastest type of boat for its size afloat.

purpose for which they are extensively used on other types of racing yacht.

The rudder of the scow is a different matter from that of the catboat; it makes no considerable addition to the lateral resistance of the boat, and its sole purpose is that of steering; any pull on the tiller, weather or lee, means that there is a lack of balance between the driving force on the sails and the lateral resistance of the boat. A slight weather helm is often tolerated, not because it is right but because it is an error on the safe side and saves the skipper from bigger losses which inattention at the tiller might incur if the boat had a tendency to fall off.

Aside from the question of indicating balance the rudder of the scow deserves attention in two other respects. One involves the old rule about moving the tiller as little as possible when sailing on the wind. It is true that a constant working back and forth will greatly affect speed to windward, but in their anxiety to avoid causing a drag of the rudders too many skippers are slow to take advantage of a favorable puff, and before their boats work up into the wind the puff is gone. Similarly, when headed by an unfavorable slant there is a general tendency to swing the bow off slowly, with consequent loss of headway. Of course it is as bad to err on one side as on the other, and the helmsman who jerks his boat zigzag fashion into and away from every little puff and lull loses more than his too conservative opponent. Nevertheless, it is safe to give the tiller a quick snap if at that particular instant the rudder is trailed out directly astern or is turned so that the resulting lateral force on the rudder will, as if by impact, start the boat turning without exerting a force opposed to forward motion. There is then no prolonged drag of the rudder as is the case when the tiller is moved slowly and the rudder is held at an angle for an appreciable length of time. It might be argued that such a suggestion if carried to its logical conclusion would result in the skipper's sculling his boat forward by well-timed jerks of the tiller, but while the same underlying principle may be discernible in sculling, no such harsh interpretation of meaning is implied.

The other matter in connection with the rudder deals only with double-ruddered boats whose tillers are joined by a tie rod. Many captains satisfy themselves that the two rudders are parallel by determining that the two tillers are parallel, and are then content to start a race. Even if the rudders always lined up with the tillers the fact that the rudders are parallel does not mean that they offer the least resistance to headway, and in fact it is doubtful if the parallel position is ever the fastest. It may be the safest in the long run, considering windward and leeward work in light winds and in heavy, but it is probable that at the risk of some error a faster position can be determined after a few trials. The trials should not be based upon performance relative to another boat, however, for the change in rudder positions must be so slight that its effect would not be perceptible in an actual race. Rather the experimenter must be guided by the position which the two rudders assume *relative to each other* when allowed to trail independently of one another with the boat under perfect balance on various points of sailing. The water flows under the bottom more nearly along the diagonal plane intersections than along the buttocks, and thus the rudders may converge toward the stern a considerable amount. An inch and a half convergence between two rudders only twelve inches long was found to be desirable in one case.

A discussion of sails seldom amounts to more than vague comment, for even with sails of opposite characteristics of set or flow the variations in form are so vague as to make description impossible except in terms of indefinite generalities. But in passing it might be said that too much emphasis is laid upon the importance of "a good pocket along the mast where the positive pressure of the wind can develop a driving force." A fair curve from luff to leach is essential, of course, but it is because of the effect on the set of the rest of the sail rather than because of any intrinsic value as effective driving area that fullness along the mast can be of importance. A portion of the sail which is continually on the verge of shaking, and indeed on many boats is seldom allowed to draw full, adds nothing to the driving force on the boat; the wind along the hoist of the mainsail, where it eddies around the mast, is in no mood to exert much pressure on the canvas immediately next the spar.

The Class E scow probably has no requirements as to sail form or draft peculiar to itself. A small sail moving rapidly into the wind must be a relatively flat one if much driving force is to be derived, and on that account a trace of the iceboat's flatness of draft might be justified in the scow; but the scow's real speed is off the wind, and although on that point of sailing its speed might be said to approach that of a slow-moving iceboat, the eased sheet of the scow limits the similarity between the two. In the case of the iceboat the apparent wind — the re-

sultant of the velocities of the actual wind and of the boat — strikes the sail from a direction far forward of abeam, while with the scow it would never reach such a point and the sails, even when planing at the highest speeds, would always be eased off.

Knowledge of the exact angle between the true wind and the apparent wind is of no practical value, but it is interesting to note that the angle is appreciable and that its magnitude is some index as to the amount which the sails of a scow must be trimmed as the boat gathers speed. With a 25-mile wind, for example, coming 30 degrees abaft the beam and driving the scow at its high speed of 15 knots the wind would appear to come from a direction 6½ degrees forward of abeam; that is, it would swing forward 36½ degrees. With winds further aft or with slower boat speeds the apparent wind would, of course, not be as far forward. The immediate effect of the wind's pulling ahead is to make it necessary to trim the sails flatter, and failure to observe this requirement is one of the principal reasons why some skippers have difficulty in prolonging the "planing periods" of their boats.

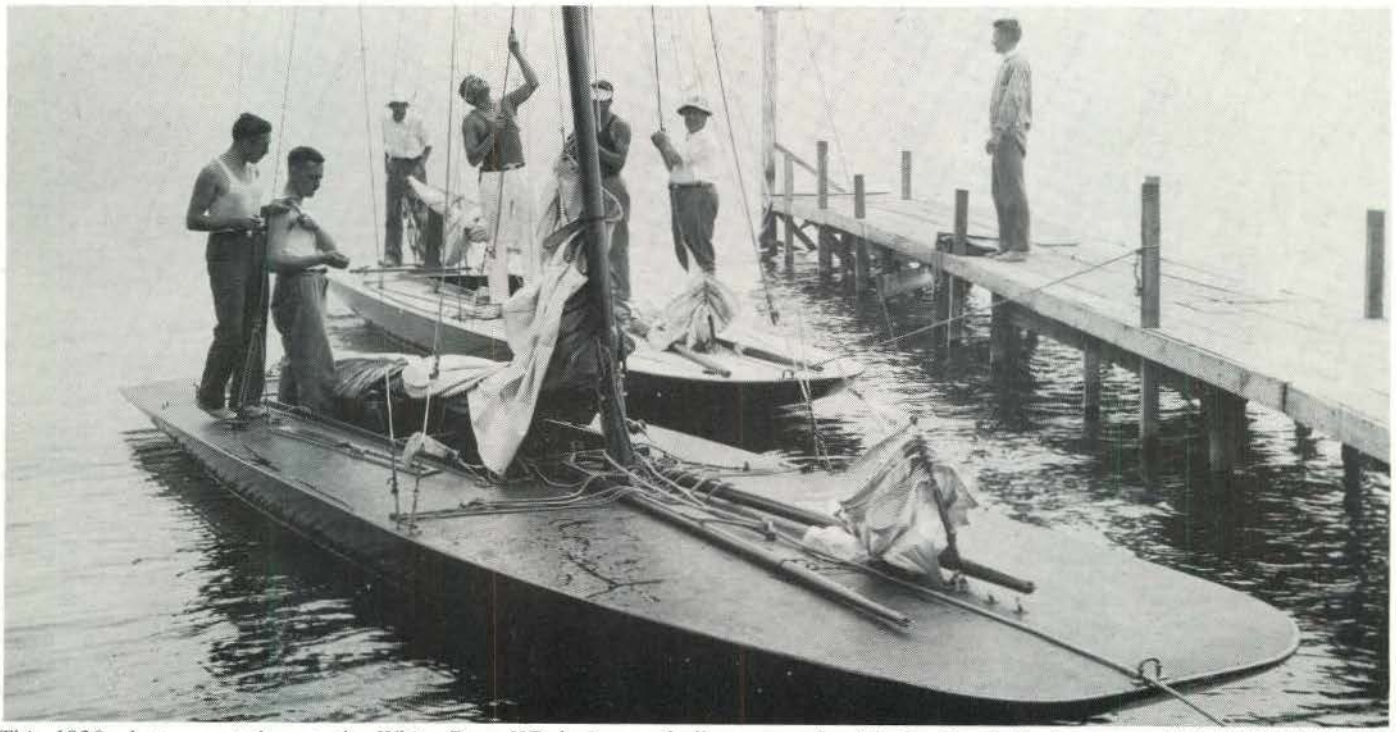
The scow is fast on any point of sailing whenever there is a breeze, but its speed with eased sheet in a hard wind is phenomenal and offers the most thrilling and spectacular touch to scow racing. To make the scow plane it is necessary — but step aboard a moment and see for yourself how it is done.

We'll tack up to windward to that buoy and then run off with the wind on our starboard quarter. It will be about four points abaft the beam when we straighten out on our course, but watch it pull abeam as we get up to speed, and notice that we have to trim our sails accordingly. Here's the buoy to port now; ready about — **hard-a-lee! Away goes the jibsheet as the tiller is put down and the bow swings into the wind. The helmsman has taken the main sheet and lets it run as she pays off; the sheet-tender has lowered the port bilge board about half way and is cleating the starboard backstay before** pulling up the starboard board. The jibsheet man has climbed over to windward and has made his sheet fast, and is now taking the spinnaker boom forward. Now, up there, mainsheet man, and hoist spinnaker; and take the sheet while the jib man sets the boom and the helmsman holds a turn on the after guy. There she draws, all pulling. Work aft now, and watch this puff; we're making 8 knots but we want 12 at least.

The mainsheet man (his title is deceiving for he has many other important duties) puts a strain on the lee bilge board fall and just before the puff strikes the sails the skipper pulls the tiller up enough to start the bow swinging off. The man on the board gets his chance; the board comes up, the puff strikes, we heave on the mainsail and give a tug on the spinnaker, while the skipper lets the tiller go free for a moment; the boat lifts and leaps forward, out on top — what is there to stop her? We seem to be riding on air, a soft cushion of foam; and making 14 or 15 miles an hour. Look astern at that deep V-shaped groove ploughed in the water; that's what one little rudder does — a tremendous drag, but unavoidable. Now give her a little board, just enough to make her hold on; and keep working the sails, heaving as we top a wave and easing off again afterwards. The skipper shoots her off on the wave tops and works her back again whenever he can; a lot of leeway, but anything to keep her planing. But we're beginning to drag a bit — settling — going to stop — stopped! Only an ordinary 8-mile pace now. So watch for another puff and we'll do it all over again — and keep her going this time.

Not every day is a planing day, and speed to windward means as much in a fleet of scows as in any other racing class, but if the crew of one boat can "get her out on top" once or twice when the other boats are not planing, their boat can lose a good many yards on the windward work and still come home the winner. So whatever you say of a scow, don't say that "off the wind there is little for the crew to do!"

ED. NOTE: We had intended to publish Part Two of "Old Emma comes to Barnegat Bay" by Slade Dale in this issue but because of the above article will hold it for the Winter issue if there is sufficient interest.



This 1929 photo was taken at the White Bear YC during a challenge match with the Royal St. Lawrence YC. MOUNT ROYAL VS. VENTURE.

Ed. Note: In Vol 20, No 2 1984 we ran the below "Adv." which came out of a spoofing parody called YAACHTING. We are rerunning it again for the same reason.

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