the SOLING MANUAL

International Soling Association

FOREWORD

The Godfather of this book is Heike Blok, whose original intention was to provide the Class with a Tuning Manual.

However it now goes much further than Tuning and contains a wide variety of subject matter covering such diverse areas as jibing, broaching (or not broaching!), big fleet strategy, and safety.

The contributors are, without exception, sailors of very great experience who are willing to share this experience with Soling enthusiasts who may be beginners in the Class, or already climbing the ladder of success.

Many of the articles appeared originally in *Leading Edge,* the journal of the US Soling Association to whom we are indebted for their willing assistance in this project. But it should be understood that the articles are all directed at Soling owners who are assumed to have had considerable knowledge of sailing in other boats before graduating to our Class. We are not aiming to instruct complete beginners.

The ISA Committee are most grateful in particular to Heike Blok for being the inspiration of this Manual, and to all the contributors who have allowed their work to be used in this way. It is hoped that the Manual will be an invaluable aid to better Soling sailing for many years to come.

August 1988

CONTENTS

	page
Introduction	3
TUNING	
Trim, trim, trim	9
At the helm of a Soling	11
Sail styles	12
Bertrand on boat speed	13
Mainsail trim	14
Shroud tracks	15
Shroud track installation	16
Use of shroud tracks	17
Light air spinnaker trim	17
More on jibstay sag	18
The reach to reach jibe	19
Tuning with two boats	20
Sail setting techniques	21
Using flat mainsails	23
Rudder pin warning	24
Measuring jib shape	24
Techniques	25
Getting numbers off sails	26
Soling tips	27
Marking up your Soling	27
Sail selection and use	28
Interview with Robbie Haines	29
SAILING	
Jibing in winds over 20 knots	33
Melges on ...	33
Gusts and fluctuations – changing gears	35
The light air jibe	36
Big fleet strategy	37
Heavy air running and broaching	38
Get it together ... together	40
Boat speed	41
The spinnaker takedown	43
Heavy weather reaching	44
Sailing the run	45
FLEET PROMOTION	
Building stronger, more active fleets	46
SAFETY	
Safety measures	47
Make safety a must – not an option	49
Flotation test	50
ISA Committee and Officers 1988	51

Most photographs by Roger Lean-Vercoe.

Published by The International Soling Association, P.O. Box 2, Bordon, Hampshire GU35 9JX.
Telephone: 04203 2293. Telex: Boating 47393. Fax: 0703 629924.

Typesetting by Origination Set-Up, Launceston, Cornwall, England.

Printed in England by Fulltrack Ltd., London SW11 3UW.

INTRODUCTION

How to become a Soling owner and enjoy it

by HEIKE BLOK

Probably the best way to become a Soling owner for the first time is to buy a second hand boat. Your National Secretary will almost certainly have some details of boats available, and you will use the skills and knowledge which you have gained in other classes before graduating to a Soling to judge the condition and value of these.

But if like me, you may perhaps decide to buy a new boat direct from the builder, the Class is fortunate in having a number of high quality licenced builders who are listed in the Soling Guide -- also available from your National Secretary. It happens that I myself have used boats built by Abbott, of Canada, and if I refer to this one builder it does not imply any special superiority, but merely personal choice.

I have, in fact, just ordered a new Soling – my sixth. It's a great feeling to order a new boat. It somehow happens, like a new romance . . . but cheaper. It's not like buying a car. Maybe like buying a nice painting. I know now that the object of my excitement is not going to fulfill my dreams (like with the romance). I also know that I must not try to oversee the consequences of starting again with a new boat. I mean the real consequences, like all the wet and cold you will again be most likely exposed to, all the criticism you will have to endure after you wanted to be in all corners of the race course at once, all those thousands of kilometres of driving towards that one supposedly heavenly place where you are going to get all those laurels. The way back, after you did not get them (with a hole in your boat?). Once I told Bertrand Cheret, the famous French helmsman and sailmaker, that, if I would be sent to hell, I would have to pack my boat and sails in the rain every day. He then added: "and drive (home) a thousand kilometres!"

This was going to be a booklet to entice you . . . . But you see, I know that before reading this you must have already reached the point of no return in dreaming and so, I'll better help you make the best of it, as well as I can. And so, let's keep this practical – just *because* we are dreamers. Yes, I said we. You can't be all that different!

Let's start the circle

Let's start the circle after you decided to want to sail an Olympic class and close it, after you're ripe for a new boat and want to sell your old one.

Once you feel the wish (urge) to sail Olympic you must realise that you are pretty ambitious. You want to win man! Winning, however, is not easy in an Olympic class. There are some more guys out there who nurse the same feeling and probably have the same good background in sailing as you. If you want to go for the metal you must find two more guys with the same ideas and by sheer perseverance, mold the three of you into a powerful, smooth running machine, pulling all the right ropes at the right time. The boat to do it in, in a most exciting and ideal way is, of course the Soling! It is:

- very exciting to sail in all winds!
- easy to rig (and put away on the trailer);
- easy to tow, although in some European countries you need a car with a weight equal to the total weight you're towing;
- a very "honest" boat. A strict one design class with a very good class organisation;
- it is sailed with a limited number of sail types. One main for almost all conditions and you take two jibs on the water;
- it's long lasting;
- very little homework on fittings and rigging;
- very easy to tour with.

The builder

Apart from the fact that we want quality, I like to have some personal relationship with the builder as I feel that he is making a very personal thing for me, a thing I will have to live many emotions in and a thing I want to be proud of. ("Can I come aboard and look at your . . . .").

HOW TO BECOME A SOLING OWNER AND ENJOY IT -- continued

Heike Blok

It helps very much to have a builder who sails the boat himself. He will understand all the above and will be able to help you much better with the lay out.

The lay out

Paul Elvstrom, Buddy Melges and Bill Abbott have done most of the development for the Soling class and that is why we have now a very mature one design boat with everything working as it should.

There are many ways to play a tune and that goes for arranging your working room in and on your Soling too. Let me mention a few (working) principles and possibilities as in the end you'll have to make up your own mind anyway on this very important issue.

Buddy Melges once told me (he told me many things!). "If you can't do it right away, with a minimum effort, it's wrong. It's got to *work* and if it does not, the boat will sail you instead of you the boat!"

Everything *must* work and smoothly at that. That's one very important principle.

Don't overdo it; simple is almost always good.

- you must decide whether to have all the controls at your (the helmsman's) fingertips, or to let the guy up front handle some. (For instance, the jib halyard, the jib foot and the main Cunningham.)
- is my crew going to want hiking straps or bars with anklets?
- who is going to hoist the spinnaker?

Those are some important points the solution of which can be found by talking (and asking!) your competitor-friends and this is also an excellent exercise in keeping our sport "gallant"!

Once you get the boat going, don't start changing the layout too soon. Exercise will make you get a certain "feel" of the boat and you'll get used to the layout. Having different crews does complicate a lot of things, however.

Tuning your Soling

You want the most rake in light air so as to obtain enough weather helm. Let's start the rake at the zero end of the wind scale and mark the forestay rope accordingly. This mark is the first and CENTRAL mark on the many tuning aids available on your boat and we are going to make most of them so that for every condition (wind-force and waves) you have a fair and pretty solid base to start shooting for "bulls eye", being optimum speed.

Optimum speed is, of course, very theoretical, but once you get close to it you are liable to be one of the fastest boats at the moment. Once your sailing machine is "calibrated" properly only then can you start searching for that elusive moment of optimum speed. The sooner and closer and longer you can stay there the better and above all you will really then ENJOY your Soling most!.

HOW TO BECOME A SOLING OWNER AND ENJOY IT – continued

The latest trend in setting up the mast is that:

- the spreaders are fixed perpendicular to the mast;
- are unmovable;
- you use shroud tracks (with one car);
- the upper shroud ("uppers") have a tension of about 770 lbs and are attached to the most forward eye of the car;
- the lower shroud ("lowers") are adjusted depending on the wind velocity;
- the forward end of the car is elevated to facilitate dropping the mast;
- the shroud tracks are mounted on a wedge the medium vertical angle of which should be roughly equal to your mast rake and is slightly tilted inward;
- the horizontal angle of which should be parallel to your keel line;
- (a case can be made to have the horizontal track-angle running parallel to the deck/hull edge).

The rake, starting at point zero wind could be:

- 9.90 m measured from the top of your mast to the edge of your transom. (If your sails are of late this rake is fine; if the main leach is slightly longer as in older sails, your rake might have to be 9.93m);
- your cars are moved two notches (5 to 10 cm) forward in relation to the middle of your mast;
- your backstay is "in position", meaning that you carefully took some of the slack out of it.

Now you're set for light air and we should take a look at the sails. *Sails which close or open too much are very harmful to your speed but if in doubt, open up rather than close!* Now Buddy Melges or Dave Curtis or Robbie Haines can see at a glance whether a sail is too open or too tight. We need a point of reference just to make sure! *With main and jib it's the top batten in relation to your boom and in the case of the jib in relation to the keel line and point zero is parallel to both the boom and the keel line.* This point "zero" can be maintained almost always and as a matter of fact, should. In very light air and lots of wind the battens should be opened but that you would have guessed! (In chop and medium winds you "close" the "flaps" somewhat; in long waves and medium airs you open up.)

You open up the main with your backstay (first) and your traveller when your weather helm starts causing your knuckles to become white. To improve your steering balance even more, you want to promote lower mastwind by starting to tighten your boom vang. If the udders under the cows begin to swing in the breeze, then you really open up everything and fully tighten the boom vang. In such winds (25 miles/force 7 and onwards) you'll find that your backstay needs very little pulling. Your shroud cars are moved backwards (according to your feel/weight of your crew), the luff of your jib is tightened (5/8 cm) and of course, the jib clewboard is moved down on the jibtrack by say, 25 to 30 cm or, until you loose most of that backwash in your main and above all until the boat feels fine. Your outhaul is pulled tight.

If you would have done all this without having straightened up the mast a few notches with your forestay you would have found that, it was necessary to do so in order to be able to trim the mainsheet enough for bringing the leech tighter.

The leech of your main would have lost all of its power, your boom lying idle on your deck *So, as the wind increases we straighten up the mast, one notch at a time, one notch being 3 cm and representing the distance between the marks on your forestay rope. We stop straightening the mast at 10 cm.*

For that purpose, it's important that you have your marks right, on that forestay rope! This is how I would put them on.

- You take a measuring tape of at least 15 m long;
- You hoist it to the top of your mast with your main halyard;
- The mast must be pushed backwards until the forestay is taut;
- The backstay is put in position (just take the slack out *without bending the mast!)*
- The distance is measured on the upper edge of the transom;
- At the same time the forestay rope is held at the edge of the foredeck/cockpit, the slack gone one ringmark is made there;
- The mast is straightened 3 cm (on the transom!), another mark is made etc.;
- The "zero" mark has one ring, the second two, the third three, and the last, at 9.99, could be solid red.

The jib is the most difficult sail to set up properly and thus, effectively. This sail can become your magic stick (wand?) or, for that matter your headsman's axe! It's the leech that's the leacher! *A bit too slack*

HOW TO BECOME A SOLING OWNER AND ENJOY IT — continued

(open) and you're not pointing. A bit too tight and you're stalled and stopped dead in your tracks.

Let's set up the jib and get our "zero points" lined up and take mast rake 9.9 as a basis again.

- The jib foot should curl slightly on the deck if the foot is cut rather full;
- The "jib up" (jib halyard) should be pulled until the wrinkles in the jib luff disappear;
- The jib should be sheeted in the clew hole suggested by the sailmaker;
- When you start sailing (close hauled) the top batten should be parallel to the keel line or a trifle open;
- The jib car is 30-25 cm from the mast centre. (In very light air as in heavy air, you open up.)

And once you get going, *you have to keep playing that jib* as the windforce hardly ever is constant! (Keep eyeing that top batten!) In light winds you want a sagging forestay to let the fullness of the jib wander aft. This is achieved by moving the shrouds in front of the mast (when you have shroud tracks!). Also, the main has a tendency to close its leech and if you wanted to open it up with your backstay, your forestay would become too taut. *Now that your shrouds are in front of the mast it is they which take the strain off your forestay* (don't forget to put them aft again when you drop the mast!!).

You go one or two holes down (or forward) on the clewboard when the wind increases.

The spinnakers

The biggest is used for running as it's a very full sail. Number two is the large reacher, a somewhat flatter shaped sail. Number three is a smaller reacher.

The spinnakers are stowed in specially-designed storage bags, under the side decks. When needed, they are pulled out from under the deck. Very efficient!

Your three spinnakers would have to be folded in such a way that the result is a small package with the grommets and the top looking out of the package. It's held together by a loosely applied shock cord and when hoisted, it should (!) open.

The spinnaker pole is carried mostly on the mailsail boom. It can also be fixed onto the foredeck (the Elvstrom method).

There are two (sometimes four) barbers for the spinnaker sheets. The position of these barbers often varies and remains a point of discussion. I prefer them to come out of the deck in between the fore and middle man and within reasonable reach of the helmsman.

The sailmakers

There are a great number of sailmakers; the major ones advertise in the Class magazine..

At the hoist (or how to avoid a disaster)

The hoist is unavoidable and we depend very much on it to get into the water. Now, there are hoists and

HOW TO BECOME A SOLING OWNER AND ENJOY IT – continued

hoists! Fully automatic, hand driven, tail, short, new, old, mobile, well – the lot! Before delivering your precious boat into the hands of the crane driver, you must ascertain that:

- The crane is capable of lifting 1500 kg;
- Will not topple (mobile cranes!!);
- Has a good-looking cable;
- It will turn rather smoothly;
- The water is deep enough for your draught (you need 1.50 m).

Furthermore, it is *your responsibility* to ascertain that your boat *is ready* to be lifted either with the mast laid or standing up, depending on the type of crane. If the mast is up then you must take away the back stay but not before you have supported the mast with your spinnaker pole. (One end in the pole ring, the other on the deck.) The mast should tilt slightly forward but without the support of the spinnaker pole the mast would fall forward!

- Your hoisting cables are 100 per cent;
- They are not twisted at their fastening eyes;
- They are supported sideways with rope to prevent the boat from heeling in the air;
- Your mooring ropes are in position and hanging down;
- You have one man at the tip of your keel to prevent it from hitting your trailer. (It'll save you so much work!).

REMEMBER, A BOAT FALLING OFF A CRANE CAN DESTROY LIVES!

Maintenance

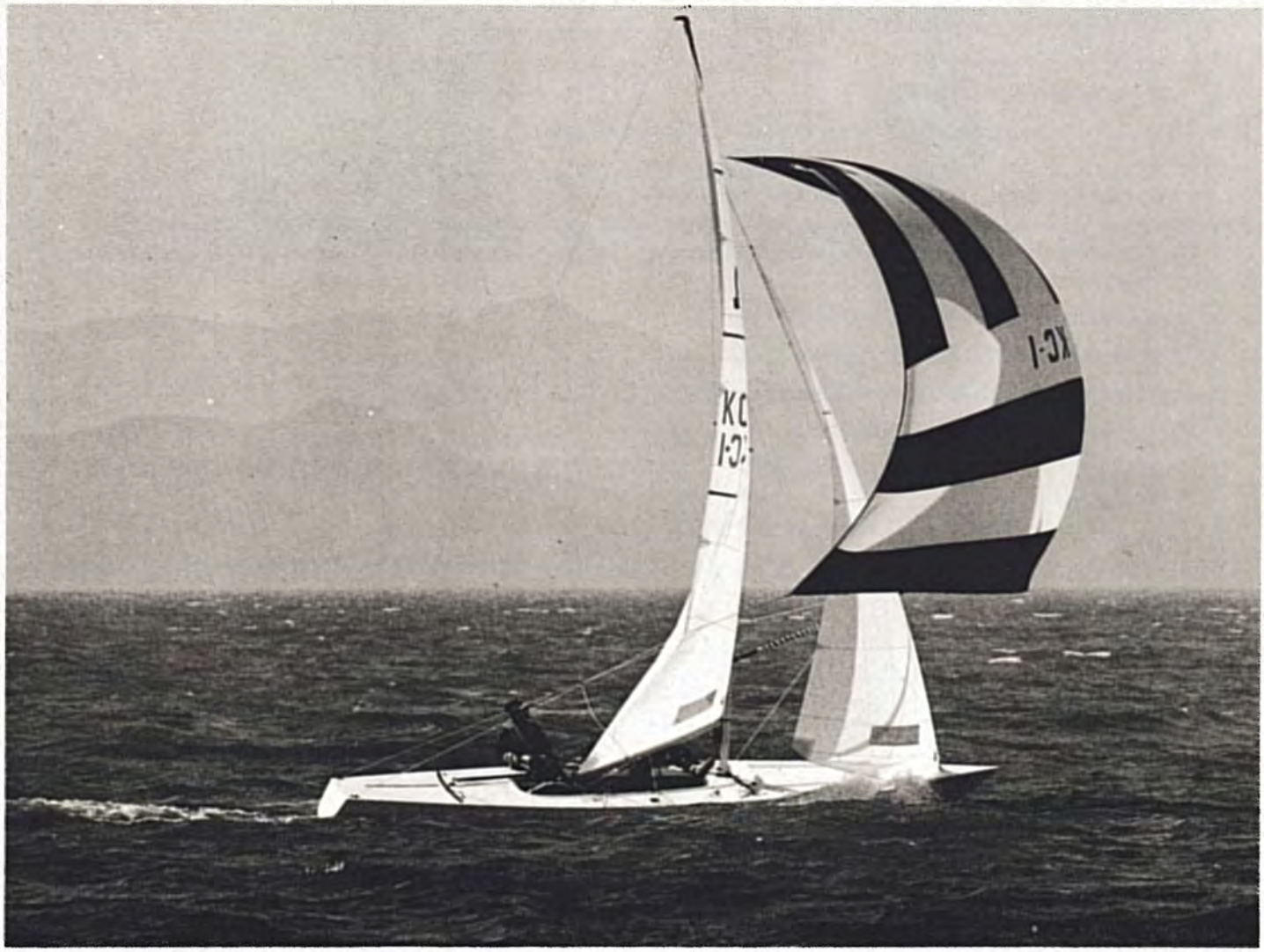
Fresh water and a sponge do most of your maintenance work. If your hull had a speed rubdown job the hull looks like an egg shell and you dispose of stains with a Scotch cloth or sandpaper. Once or twice during the season you may polish the hull with a quality brand of silicone wax (Hempel) to preserve the resin in the fibreglass of your hull. It will also make the hull less adhesive for dirt in the water. (Oil!) If you must leave your Soling in the water for longer periods of time you need a good anti-fouling which does not necessarily slow down the boat. (Teflon with bronze!).

Use a large cover overnight and as you're waiting for wind. The sun rays are bad for your fibreglass deck, especially if you have a coloured deck. A total cover when trailering will keep your boat clean on the inside and enables you to carry luggage and stuff in the boat. After 7, 8, 9, even 10 years, your boat will still look handsome and you will then be able to have it fulfill its promise of a high resale value but, as I indicated, you must help her a bit. Also, in the meantime, you'll enjoy your Soling so much more and you will find out what a terrific Olympic class the Soling is!

This closes the circle and after doing it once, I'll bet you'll be back for another "circle" and in the process make a lot of friends!

Schindellegi, Switzerland. **Heike Blok**

Winning is the result of
TOTAL INVOLVEMENT



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TUNING

Trim, trim, trim

by FRANK BETHWAITE

In recent weeks it has been my privilege to be reminded yet again, that people from different places approach their sailing from totally different backgrounds. The prairie sailors of Saskatchewan have never learned what a steady wind is, while Sydneysiders would find it hard to imagine the contrariness of air which prairie sailors assume is normal. The place where people sail must colour their priorities.

But the differences go deeper than just the places and conditions that people sail in. What they sail, how they learned to sail, and what they are now beginning to expect from their sailing, are even more important. As I move amongst the various groups, listen to their questions and watch how they sail, they seem to fall into three separate groups.

In North America the emerging group are the sailboard sailors. Because sailboards are so light and therefore respond so quickly and sensitively to the slightest fluctuation in the speed or direction of the wind, all board sailors know all about the fact that the wind is never steady; they also know how to handle the unsteadiness on a "second-by-second" basis because, otherwise they fall over. What they don't yet know is how to exploit the wind's unsteadiness for extra speed.

The larger group, which is dominant in North America (where there is almost nothing yet which compares with out light-weight skiff and dinghy classes) are the sailors of conventional mono-or multi-hull craft. Because all larger boats are necessarily heavy, and therefore have sails and spars of a size which cannot normally be conveniently manipulated continuously and quickly, it has been normal for the crews of these boats not to adjust to brief changes in the wind as they sailed. Instead, there has grown the convention of thinking of the wind as it has always been described in sailing books, i.e., as a steady flow.

The third group – the principally Australian crews of the light and sensitive skiffs and dinghies which have become so numerous here, but which even now are seldom found anywhere else – are intermediate between the other two. Because these boats are light in weight and have sails which are either big or powerful or both, they are as sensitive to the wind's subtle fluctuations as a sailboard. And because the rigs of all the advanced boats are, almost without exception, adjustable, their crews have been able to experiment by adjusting as they sailed and are learning from experience what should be adjusted, and by how much, for greatest speed in different conditions.

A summary of the adjustment techniques which appear, at the present time, to be fastest when racing upwind would be:–

(1) As wind speed changes

There are two parts to this:–

(a) Adjust sail's fullness and twist to achieve least wind resistance when sails are trimmed to maintain the desired boat speed through the fluctuation lulls.

(b) During the short-period fluctuation puffs, ease sails slightly and point slightly higher so as to maintain desired boat speed through the puff, (i.e., sail the boat like a sailboard).

(2) As water roughness changes

Adjust sail fullness and twist for least wind resistance when sails are trimmed for desired boat-speed. Note that whenever substantial wave action increases the hull's resistance, and thus substantially greater drive force (power) is required to maintain the desired boat-speed, the trim of the sails in stronger winds will not be the same in (2) as it is in (1).

Figure 1: Laser II sailing on a jib and leech of main with jib sheeted firmly and mainsail eased to keep boat upright. This commonly-accepted trim for "survival" winds is slow.

Figure 2: Preferable strong-wind trim; main flattened for minimum drag in lulls, jib eased until mainsail backwind just appears in the strongest pulls.

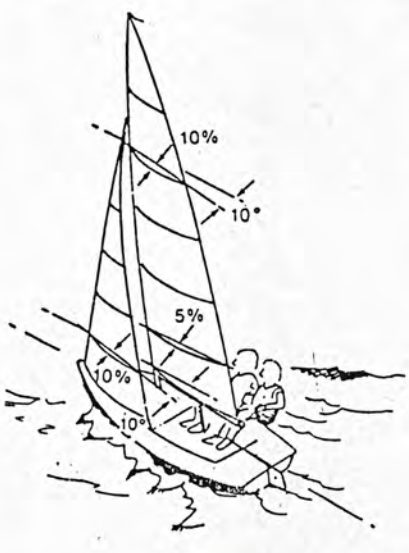


Figure 3: Fastest trim 10 knots flat water. Lower jib 10% to centre line, upper main twisted 10%, lower main flattened to avoid backwind and hooking.

TRIM, TRIM, TRIM – continued

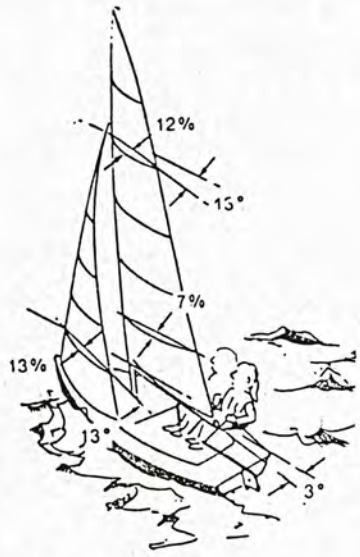


Figure 4: Fastest trim in 10 knot wind. 1-2 foot waves. Extra drive needed so both main jib sheeted 3° wider and set fuller. Leeches still parallel to centre line.

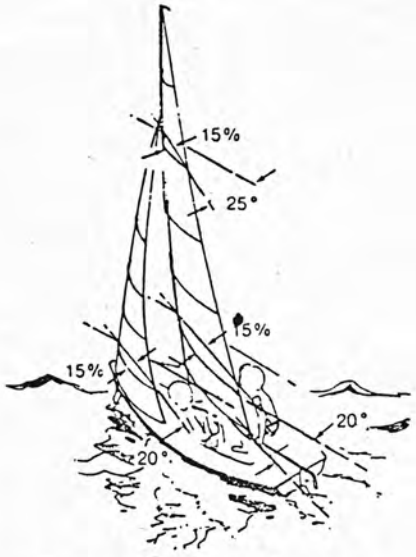


Figure 5: One knot wind, 1-2 foot waves. Rig movement to wave action prevents leeward side flow remaining attached so feeble pressure force only, no suction force.

Figure 6: Fastest trim, 3 knots wind, wave 1-2 foot. Sails everywhere about 15% camber, for maximum possible power, sheeted as wide as necessary, virtually no twist.

(3) As wind roughness changes

Adjust the sails' springiness (elasticity) for least loss of speed at times of abrupt wind speed changes at gust edges.

The following examples will show how these adjustments are employed.

Laser II Canadian Championships, at Kingston, Ontario. About 50 generally young and light crews sailed three races on a Saturday, in winds sometimes 8, but usually 10 to 12 knots. Wave height was a maximum of 2 feet. I noticed that in the stronger winds the majority of crews continued to use normally sheeted jibs, and "spilled power" by easing mainsheet tension, with the result that the mainsails often showed substantial back-wind in the puffs (Fig. 1).

This is a very "high-drag" trim. At a seminar with them that night, I pointed this out, and suggested that they could improve their speed in the stronger winds by a combination of easing jib sheet and sheeting the jib slightly wider (for those whose boats had jib lead travellers) so that no backwind appeared in the mainsail (Fig. 2).

On the Sunday, two further races were sailed in winds of 12 to 16 knots. Several crews thanked me afterwards and reported improved placings in the fleet – the lighter crews in particular were able to improve markedly.

Tasar Canadian Championships at Elbow, Lake Diefenbaker, Saskatchewan. At this two-day, five-race regatta, the maximum wind speed varied between about 7 and 12 knots. The principle feature, however, was a consistent one hour "cycle" in the wind speed, i.e., the wind would blow at, say, 10 knots average for 30 minutes and then at 2 knots average for 30 minutes and then 10 knots again. Lake Diefenbaker averages about 4 miles wide and approaches 100 long, so there is plenty of fetch for wave action to build. As a result, each race would sequence through, not four, but five phases:

(1) Wind say, 10 knots, and flat water. Boats sailed fastest upwind pointing very high, at hull speed (5 knots) through the water, trimmed as in Fig. 3, with jib and upper main about 10% camber, and lower main (behind the jib) 5%, and twist of main 10°.

(2) Wind had been at 10 knots for 20 minutes or so, waves had increased to 18 inches. Boats sailed fastest through waves pointing lower and driven at about 5½ knots and fastest sail trim was about as in Fig. 4 with 13% jib, 12% upper main and 7% lower main. Twist still 10°.

The wind speed then reduced suddenly to about 2 knots average, but blew at about 1 knot mostly, with ephemeral "fingers" at about 3 knots. Waves continued at 18 inches, fortunately they were regular, so:–

(3) In the 1 knot areas, the only way to achieve any movement at all through the waves, was to set the sails full and wide and point as low as necessary to achieve movement (Fig. 5) but . . .

(4) Whenever 3 knots of wind was enjoyed, the boat could be accelerated to about 1½ knots, which provided a useful apparent wind and the boat, after acceleration, could then be "wound up" to maintain its 1½ knots on a close reach with sails set (Fig. 6) at about 15% camber, sheeted as wide as necessary for the speed desired and with virtually no twist.

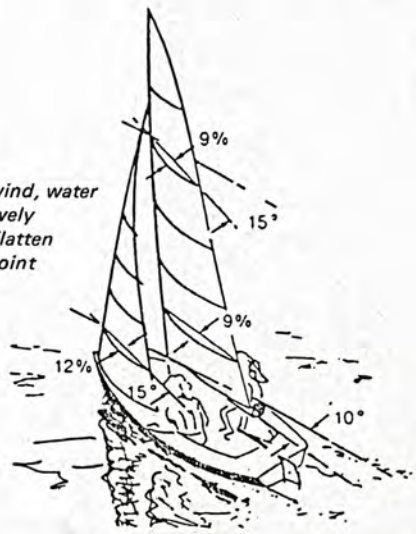


Figure 7: Fastest 2 knots wind, water almost flat. Point progressively higher, sail a little slower, flatten sails. Whenever in doubt, point lower for speed.

TRIM, TRIM, TRIM – continued

(As wind speed increases, three factors combine with almost trigger effect: Wind force increases as the square of wind speed, so 3 knots gives nine times the force of 1 knot. Resultant boat speed further increases wind speed across the sail and at some point, lee flow across the sail adds suction force. The boat begins to move freely on a close-reach heading and can then be "wound up" to a more close-hauled course without loss of speed. In these conditions, always accelerate before winding up, otherwise potential performance cannot be achieved. Use sails as full as necessary and point as low as necessary to provide enough power for the critical boat speed.)

(5) After about 20-25 minutes of virtually no wind, the waves became smaller to the point where more normal light-air techniques were efficient. In the Tasar, in the small waves, these were jib about 12%, mainsail about 9% top and bottom, close reach for boat speed and increased apparent wind, then wind up to point as high as possible while maintaining the achieved speed (Fig. 7). (Not surprisingly, these races were won by those crews who found and exploited the 3 knot "fingers" best. The "prairie sailors" as a group, were better at this than any of their visitors.)

At the helm of a Soling

by BORIS BUDNIKOV

From *Launches and Yachts* No. 4/104

The majority of contemporary Solings are well balanced with the heel of the mast mounted in the extreme aft position, which permits the construction of a fixed step.

On a correctly rigged mainsail the upper batten must be parallel to the boom. This is easy to check on from the cockpit, by matching the view of the boom and the batten. In strong winds the upper batten can be somewhat inclined towards the wind. In weak winds somewhat turned down from the wind.

The depth of profile of the sail and its position are regulated by the tension on the backstay, the vang of the boom, and the boom sheets. Several types of sails (particularly those of Melges) demand increased tension on the vang (guy ropes) of the boom in order to remove the "belly" in the lower third of the sail. However, in weak winds (up to force 3) this must be done extremely carefully so that with the excessive hauling in of the boom vang, we do not involuntarily displace the upper batten to windward, which would result in the boat noticeably losing speed.

Increasing the tension on the backstay flattens the leading forward part of the mainsail; as a rule the Soling in this case tacks with a good angle and speed. Tensioning the guy ropes of the Cunningham, we shift "belly" forward. By regulating the tension on the foot of the sail along the boom, we make the profile of the sail either fuller or flatter.

As was already said above, many competitors around the world use mainsails from the firm of North in both weak and moderate winds. In tuning such a main, the model FP-6 as a starting point, one can follow the following recommendations. The maximum degree of flex of the mast between the upper band and the mark made on the boom: in winds less than force 2 this must not exceed 100 mm; in winds of force 2 – 150 mm, with winds of force 4 and greater – 200-250 mm.

The tension on the head and the foot of the mainsail should increase with the increase in the wind force: from – weak winds of less than force 2 up to the very strong, allowing you to make the mainsail flat in winds of force 4, 5 and above.

In weak winds (up to force 2) the slide-block of the boom sheet is placed at the centre of the track. In winds of about force 1 and with choppy seas, it is recommended to have the slide block shifted to the windward side from 50 to 700 mm, so that the boom aids the diametrical plane of the boat. In winds of greater than force 3, the slide block of the boom sheets is shifted along the shoulder piece track towards the leeward side in order that the boat should exhibit a tendency to accelerate without heeling.

With increased winds the upper part of the sail should be made flatter. A full sail in the upper parts significantly reduces the speed of the Soling in fresh winds. With an increase in the wind to force 3-4 the mainsail is better replaced for a flatter one, sewn of stiff materials and allowing greater tension on the backstay in comparison with the FP-6 sail.

Launches and Yachts, No. 4/104. Founded in 1963 – Leningrad. A scientific-popular and sport-systematic journal of the Committee for Physical Culture and Sport attached to the Council of Ministers of the U.S.S.R., and the Scientific Technical Society named for the Academic A. N. Krylor.

Hyères 1988

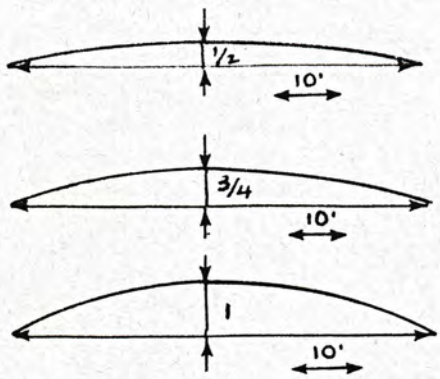
Sail styles

by JOHN GLUEK

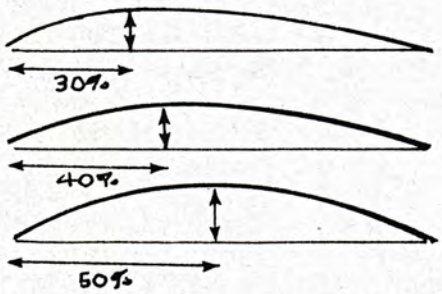
(Editor's Note: The following was written by John Gluek the Manager of Melges Sails, Inc.

Different sail styles are necessary when Soling sailing because of the difference of crew weight, sea conditions and wind velocity. The inventory we use to meet all conditions are three jibs, two mains, one large reacher, one runner, and one small reacher. The difference between the same type sail lies is cloth used, the location and shaping of the broad seam panel and the luff shape.

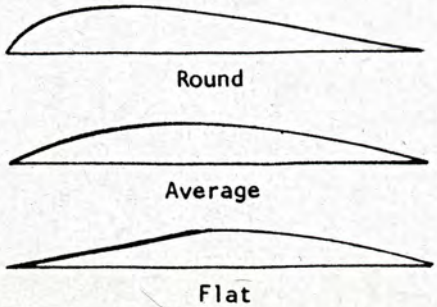
There are three jib styles; heavy, medium and light. When considering which jib to use one should look at the camber or depth of the cord which is the relationship between how deep the sail is versus its fore-and-aft length.



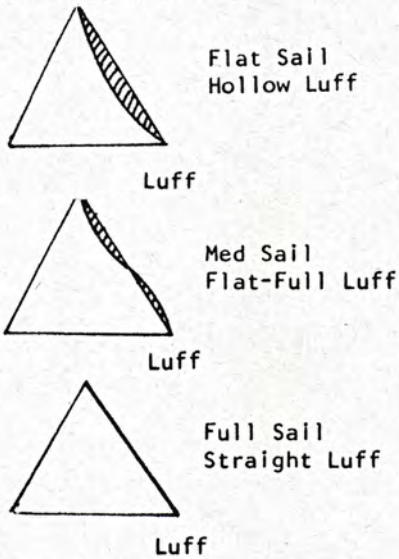
The position of maximum camber which is the percentage aft in a sail the maximum depth is located.



The shape of the leading edge or entry of the sail is either: round; average; flat.

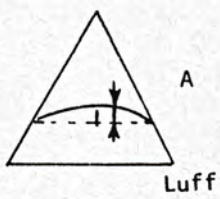


Finally, the luff curve which is the shape of the luff while it is lying flat on the floor.

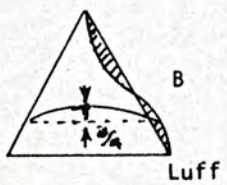


These are jib characteristics we find to be the fastest in different wind and sea conditions.

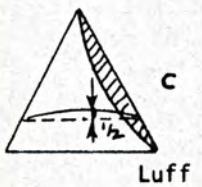
A Light air or lumpy seas
1. Depth of cord — Deep
2. Camber — Forward
3. Entry — Round
4. Luff — Straight
5. Leech — Free Twist



B Medium air — short chop
1. Depth of cord — Average
2. Camber — Aft
3. Entry — Average
4. Luff — Flat-Full
5. Leech — Straight-Closed



C Heavy air
1. Depth of cord — Flat
2. Camber — In between
3. Entry — Flat
4. Luff — Hollow
5. Leech — Free Twist



It is important to realise that through all the designing, cutting and shaping of the jib, the trimmer has the final control. With much time on the water experimenting with luff tension, headstay tension, lead position and sheeting; you should be able to get the most out of your jib in any given situation.

Luff tension

Should be applied to eliminate horizontal wrinkles on the luff which controls draft position. When tension is slack the maximum draft is aft the sail (0-8 knots); tension is snug draft, is medium (8-18 knots); tension is tight, draft forward (18 knots up).

SAIL STYLES – continued

Headstay tension

Is most effective by applying backstay tension. By easing backstay it eases tension of the headstay creating sag and a fuller jib tightening the backstay does the opposite.

Lead position

1. 0-11 knots with lumpy seas and wind variable.
   A. Car 9-1/1" from centre line.
2. 6-18 knots.
   Car 12" from centre line.
3. 18-15 knots.
   B. Car 17" from centre line.

Sheeting

The conventional method to determine which clew hole to use, is to sail on the wind with the sail sheeted in and watch the sail break. If the top of the sail breaks first, then you are too far forward in the clew holes; if the bottom of the sail breaks first you are too far aft. If the luff breaks evenly from the top to the bottom the lead is right. The exception to this rule is in very heavy air we go to the forward clew holes. This gives more twist to the top of the jib, decreasing power and heeling moment.

In conclusion to all of this, I feel it is important to get together with your sailmaker and discuss what style jib you need for your power situation.

Bertrand on boat speed

by JOHN BERTRAND

In this column, I'll discuss another use of telltales. In fresh wind conditions I use jib telltales not to tell me if I'm pointed in the right direction when sailing to windward but instead whether I have the correct sail shapes for these conditions. It all stems around the following concept.

Any sail boat has an ideal angle of heel when sailing hard on the wind for a light planing dinghy this is somewhere around 5°, for a displacement dinghy like a Finn perhaps 10°, and for a keelboat it could be up to 28°. In any case, no matter what type of dinghy or yacht, best performance is attained if this so called ideal heel angle is held absolutely constant at all times. It is interesting to note that especially in high performance dinghies the boat that is being sailed steadiest is generally the fastest.

Now assuming we have found this optimum heel angle the trick then is to adjust the sail shapes and therefore the heeling power, so that when the yacht is sailing with jib telltales streaming the boat maintains this particular angle of heel. See Figs. 1, 2 and 3.

Let's assume we are sailing in a 25 m.p.h. wind, in a Soling for example. I would guess that 15° heel angle would be pretty good going to windward. If the mainsail in particular is too full we must "feather" the boat to windward to stop heeling more than 15°. This is indicated by the weather telltales lifting continuously – see Fig. 1. By flattening the main, through bending the mast via backstay and using more boom vang to increase low down bend and open the lower leech area, the rig is very effectively depowered. The jib headstay is also tightened because of increased backstay tension which in turn flattens the jib and further depowers the rig. If we depower too much we find that to maintain this 15° angle of heel we must sail too low, which is indicated by the leeward telltales on the jib lifting. (See Fig. 2.)

When the correct power is obtained in the sails we obtain the ideal condition – weather telltales breathing and 15° angle of heel – as indicated in Fig. 1.

So the whole idea is based on angle of heel and in fresh conditions the helmsman should not be using the telltales to indicate his course to windward, but instead whether he needs to depower or power up his rig. His course indicator is in fact heel angle.

In an ocean racer I never look at the telltales – instead I fix my eyes on the horizon and steer the yacht to maintain a constant angle of heel. I then ask the crew about the jib telltales and if they have continuously been lifting then we attempt to flatten the sails. If this is not enough we then depower by reefing the mainsail or changing down in headsail area.

Conversely if the leeward telltales are lifting when sailing a course to achieve the desired heel angle, then we immediately power up the sails. Note that it is always better to have the weather telltales lift a little, while it is very slow to have the leeward telltales lift at all.

When the magic combination of heel angle and sail shape is achieved the boat then starts to find its own groove and so help me it almost feels as if the yacht is sailing on a set of monorails . . . extremely steady with the minimum of rudder action required to keep it sailing high and fast.

You will often see photographs of the champions sailing their boats while maybe looking over their shoulder at the fleet. While they have been looking around their yachts are not being sailed too high or too low but instead they are exactly in the groove at all times. The reason is simply that the angle of heel as transmitted through their backside tells them the course they should steer. When they look forward they don't look at the telltails – again, the indicator is the relative angle of the forestay or mast to the horizon; and that angle, as found from many hours of practice, is held exactly constant.

To depower

1. Increase mast bend via backstay, vang and/or removing chocks at the deck level.
2. Move boom to leeward via traveller.
3. Increase Cunningham tension to move draft forward and open the upper leech.
4. Increase outhaul tension to flatten bottom half of mainsail.
5. If sailing a keelboat, use flattening reef or if necessary reef mainsail or change headsets.

Mainsail trim

by STU WALKER

After about 18 months of use, I believe I now have an understanding of how to use my North FP-6 mainsail to windward (in time for it to be out-built or wear out probably). This understanding should be useful in the trim of future mainsails and to others using this or other mainsails. The trim chart indicates the settings for various wind speeds that I now believe to be appropriate (with an Abbott mast raked approximately 40 inches).

Mast bend is critical. The minimum bend (sighting lines placed at 2 inch intervals at midluff) between tack and head should be 5 inches, perhaps an inch more in very light air, gradually increasing from 5 inches at 10 knots to 7 inches in 20 knots (a narrower range than I earlier thought). Next most important is mainsheet tension which must be co-ordinated with traveller position (particularly in very light air). I bring the leech into maximum tension at about 10 knots wind speed in smooth water or when I wish to point high for short periods. Then the upper batten is parallel to the boom (I never go tighter). In lighter air, in heavier air, and particularly in waves I ease the leech so that the batten is slightly falling off (4). The traveller car is about 3 inches to windward of the centre line in winds between 5 and 12 knots. Above this windspeed it is eased to the midline and below, but is only down 3 inches in 18-20 knots.

In light air, below 5 knots, I bring the car to windward, up to 24 inches in 1-2 knots. Then, to keep the upper batten falling off, I ease the mainsheet and the leech into a marked twist. This keeps the leech *very* open reducing side force, maximising speed at the expense of pointing. In *very* light air, in order to keep the leech free, it may be necessary to hold the boom up by hand or attach the spinnaker pole topping lift to hold it up. I never use any vang to windward and try to remember to be certain that it is loose in any light air. In heavy air I ease the mainsheet a bit relative to the mast bend. In other words, although the mast bend is only 7 inches at 20 knots, I ease the boom up about 2 inches from its position at 16 knots. The smoother the water the more backstay and the more mainsheet I would use at 20 knots, the bigger the waves the less of each. The open leech and fuller sail gives power to drive through waves, the tighter leech and flatter sail higher pointing.

The outhaul needs little adjustment; just keep the vertical wrinkles out of the foot. It is eased maximally in moderate air and waves, off about 3 inches from the band. The Cunningham merely follows the mast bend, enough tension to leave a few horizontal wrinkles in the lower portion of the sails less tension in waves, more in smooth water.

In general when boat speed is poor and drive is needed – very light or very heavy or with big waves – the leech should be open, the mast bend reduced, the outhaul and Cunningham eased and the traveller kept up to the midline or to windward. When boat speed is good and pointing and reduced leeway are needed – moderate to heavy air and smooth water – the leech should be closed (tight), the mast bend increased, the outhaul and Cunningham tightened, and the traveller let down to whatever position is necessary to prevent excessive heeling. Adjustments for starting, after tacking, hitting a wave, and in a lull are: ease the mainsheet, then ease the backstay (ease the outhaul, ease the Cunningham in a prolonged lull). As speed is required bring in the mainsheet, tension the backstay, retension the mainsheet, check the upper batten. (Get used to how a parallel or slightly off upper batten looks from the helmsman's position, but have the crew check it occasionally.) If you need to lift a competitor on the leebow, bring in the mainsheet *and* the backstay together (but don't bring the upper batten closer than parallel to the boom). The tighter leech requires a flatter sail if increased leeway is to be avoided. This works well in moderate air and smooth water. In very light, very heavy or big waves, it might be better to rely upon speed to break through without risking the increased leeway that may accompany leech tensionsing.

My use of this sail is illustrative of mainsail trim in general but *cannot* be directly applied to other mainsails (in fact my other supposedly identical FP-6 mainsail requires 1 inch less mast bend at all settings). I find the sail (at least my use of it) very fast in very light air and in heavy air (above 12 knots) but believe it lacks power (or needs better trim) between 5 and 12 knots.

Wind in knots	*Mast bend*	*Sheet tension*	*Outhaul*	*Cunn.*	*Boom position*
Smooth	+½"	Clear air +¼	+1"	+1"	-3"
Waves	-½"	Dirty air -¼	Eased	More wrinkles	Twist +6"
Pointing	-½"	+¼	–	–	
1–2	7"	Twist 3½"		Wrinkles	Twist +24"
2–3	6"		-1"		
3–4					+12"
4–5	5"	4-	Smooth	Wrinkles	+6"
5–6		4-	-2"		+3"
6–7					
7–8	5"	4-	-2"		+3"
8–9					
9–10	5½"	4			
10–12		4			+3"
12–14	6"	4-	-1½"	Wrinkles	+2"
14–16		3¾	-1"		0
16–20	7"	Twist 3¾	Smooth	Smooth	Twist -3"
20–25	8"	3¾			-6"

SAM MERRICK comments

Stu Walker's piece on this subject in the previous *Leading Edge* is *the* authoritative treatment of the sail he describes. However, it tells much of general use for most of the sails in use among Solings today.

It takes nothing away from Stu's accompanying chart to describe it as an important teaching device rather than

MAINSAIL TRIM – continued

something for continous reference under racing conditions. I make the point because the chart has evoked a good deal of comment – much of it in despair that too much was expected of ordinary sailing mortals. Relax my friends – quarter-inch adjustments even for Stu are not easily gauged to exact readings of wind speeds or the amount of chop. The art of sailing fast with the correct sail shape requires a great deal of "seat of pants" plus comparison with nearby competitors – this even for a good chart reader.

The sail Stu charts is a "full" sail – one that was developed prior to the 1972 Olympics and now manufactured by nearly all the sailmakers serving the Soling class. Its virtue is that with a stiff spar, the amount of jib stay sag is fairly predictable and constant because it typically requires a minimum of 4-5 inches of mast bend in the lower wind velocities – much more (as much as 12-14 inches!) in heavy air.

There are three sail shape elements for which the controls (mainsheet, backstay, main traveller, outhaul, vang and Cunningham) are designed: camber, twist and position of draft.

Camber, the amount of fullness, the depth of the chord across the sail from mast to leech, is the most important. It is principally controlled by the backstay – as Stu says, "mast bend is critical" – as wind velocity increases above 12-14 knots. The Soling is quickly overpowered in the sense that it heels too much and gets a weather helm. To reduce power (and heeling), more backstay tension is required to flatten the sail. Just keep pulling the backstay until the boat behaves – so that it will remain fairly upright with a fairly neutral helm. If you really do pull too much, wrinkles will run across the sail from clew to hounds, the "inside out" condition.

Camber is controlled to a lesser degree by mainsheet, vang and outhaul. In light air, you can produce a tight leech (therefore a greater camber) by honking on either vang or mainsheet – just don't do it. However, as wind increases, vang tension bends the lower part of the mast and therefore flattens the lower part of the sail. (Note that Stu says no vang upwind, but that goes for the sail he is describing which is already flat across the bottom.) Outhaul also has an important effect on the bottom (quarter?) of the sail – the tighter the flatter.

Leech tension, which controls the amount of twist, is the most difficult sail adjustment to make correctly. It is controlled principally by the mainsheet and, in very light air, by the traveller – where you trim it to windward of the centre line to get less pull downward from the mainsheet. The rule here, as Stu says, is never allow the aft end of the top batten to tilt to windward of parallel to the boom (by sighting from under the boom). But the difficulty in control stems from the sensitivity of the long unsupported leech to slight changes in wind velocity.

If the top batten is right on at 10 knots, it will jump to windward at 8 and stop the boat. If it's right at 8 and the wind increases to 10, you won't point. The ideal of a parallel batten is for smooth water. As chop gets rougher, more twist (less mainsheet tension) will be in order. As a general rule it is better to err on the side of more twist than less, because speed is better than lack of pointing. But, as always the right groove is best.

The position of the centre of draft is controlled by the Cunningham. Fortunately, the sail sends out its own signals and makes this adjustment relatively easy. As the mast is bent and the sail gets flatter, horizontal wrinkles appear along the luff. This means the draft is moving aft. Tension the Cunningham and the wrinkles disappear. Too often pulling on the Cunningham seems to be part of feeling shipshape. Better stay with some wrinkles, and don't forget to ease the Cunningham when the backstay is eased.

You can profit from each racing experience if you make your own chart and continuously modify it. Then as the race starts, and periodically thereafter, you can be assured that trim is approximately correct. Obviously, the moment by moment variations in backstay and mainsheet that are required by every variation in wind strength or wave formation and which may vary on each tack cannot be managed from a chart.

Shroud tracks

by DAVE CURTIS

When I started my campaign for the '84 Olympics it was readily apparent that race conditions on any one day could be anywhere from 8-20 knots. Since almost all Soling sail inventories change from light designs to the heavy designs in that range I felt it would be a tremendous advantage to sail through that range with one sail.

Obviously the only way we could accomplish this was to gain more control over the rig. Enter the shroud tracks. Shroud tracks are not new to the Soling class. In the early 70's many Solings were equipped with tracks for either uppers or lowers or both. Some people even used a separate track for each shroud. But the engineering was wrong and therefore the real advantage was not found. By ramping the tracks at precisely the right angle the shrouds can be moved forward or aft and not change the tension. Even though my tracks have only 8 inches of fore and aft travel we gain a significant amount of control of mast bend and forestay sag. Heretofore, that was only possible by backstay, mainsheet and vang adjustments. By using ball bearing cars it was always possible to move the shrouds back and forth in any breeze; the weather one even while hiked.

For those who might be sceptical about learning how to use the tracks it is really quite simple. Forward in light, middle in medium and aft for heavy air. In general if you need power in the jib move them forward, if you want less sag and a flatter jib, move them aft.

One of the major advantages of shroud tracks is the elimination of the constant tension adjustments to the upper and lower shrouds. Tracks also eliminate the need to change the spreader angle for different conditions.

Obviously I'm in favour of keeping the rules as they are. Although not cleaner, the tracks do allow simpler tuning, and altogether eliminate the need for two mainsails.

Shroud track installation

Warning: Do not remove cars from tracks.

(1) Find the breakwater measurement point at the deck edge corresponding to the forward face of the breakwater.

(2) Determine the point 250 mm aft of breakwater measurement point. This is maximum forward point for forward shroud (see Rule 6.2).

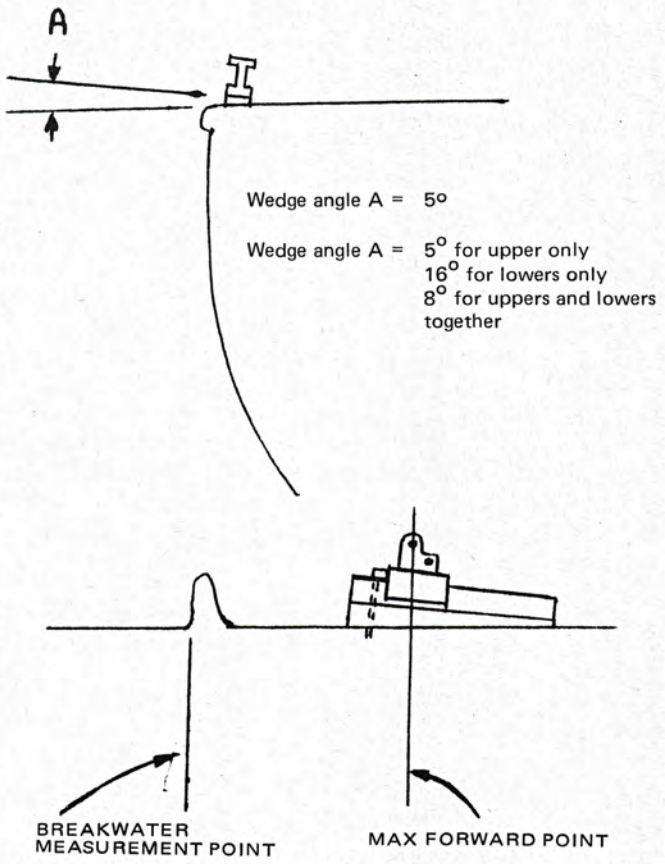
(3) With car in maximum forward position locate centre line of track 1¼ inches in from edge of deck sheerline. Drill ¼ inch hole for forward bolt and insert.

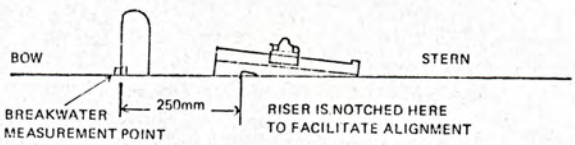
(4) Locate after bolt so that tracks are parallel to edge of deck. Drill and insert bolt. Locate fore and aft hex cap bolts so that the car meets the bolt on a flat face.

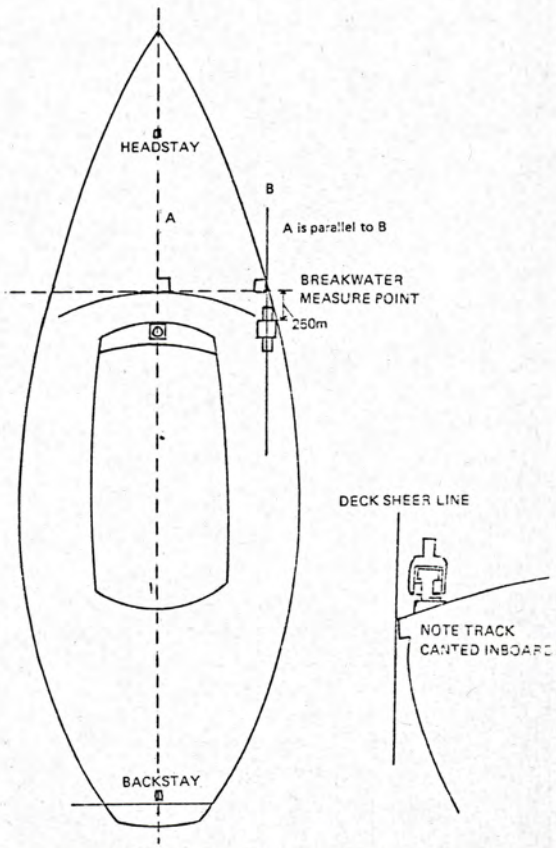
(5) Drill remaining holes and insert bolts.

(6) When tightening bolts, be sure to turn nut only to prevent breaking the bolt.

(7) If separate lower shroud tracks are used, the centre line of the inner track must be within 100 mm of the edge of the deck.







Use of shroud tracks

by STU WALKER

Shrouds are intended to hold the mast and the jibstay in a manner which permits the sails to maintain their optimal shape over a wide range of wind conditions. Fore and aft movement of the shroud attachments at the deck is indended to improve shroud efficiency. When it is desirable for the jibstay to be slack or the mast to be bent forward (or both), they can be made so by sliding the shroud attachments forward to bend the lower mast. This "pre-bends" the lower mast, i.e., bends it forward without tensioning either the jibstay or backstay. When it is desirable for the jibstay to be taut or the mast to be stiff (or both), they can be made so by sliding the shroud attachments aft to stiffen the lower mast. These effects are accomplished because the upper shrouds, attached to the fixed spreaders, pull the middle of the mast forward when their attachment site is shifted forward, thereby bending the lower mast and slackening the jibstay and pull the middle of the mast aft when their attachment site is shifted aft, thereby stiffening the lower mast and tensioning the jibstay. The advantage of the system is that these effects can be achieved independent of direct manipulation of backstay and jibstay tension and that the jibstay can be made slack without excessively straightening the mast or tensioned without excessively bending the mast.

It matters not whether both shrouds are attached to a single car or each to its own car. However, it is important to be able to adjust lower shroud tension independently either by changing its position on its own shroud track or by changing its turnbuckle setting. The latter is simply accomplished by twisting the turnbuckle (which in the case of the lower shrouds needs little tension at any time) and its position can be maintained by looping a strip of velcro through the turnbuckle and around the upper shroud. Dual shroud tracks appear unnecessary.

Fine tuning

The "fine tuning" of the shroud track rig is dependent upon the need to increase or decrease "power". The rig is typically "underpowered" in light air (when the shroud forward/slack jibstay rig increases the fullness of the jib and keeps the main at its maximum designed fullness) and "overpowered" in heavy air (when the shrouds aft/tight jibstay rig flattens the jib and permits the lower main to remain full while its leech opens). In the mid-range of wind velocities (6-14 knots) with chop, particularly when the velocity is varying markedly, changes in available "power" can be partially treated by shroud car movement. The essential is to recognise when the boat is "underpowered" or "powered" or "overpowered". This is done by:

(1) "Feel" – does the boat feel lively or sluggish? Does it respond to puffs and gusts by acceleration or by yawing and heeling?

(2) Balance – is there an appropriate or excessive weather helm or a lee helm?

(3) Angle of heel – is the lateral position of the crew appropriate to the wind strength or is the crew being kept inside (when they should be hiking) in order to retain an appropriate "feel" and balance or required to hike when other crews are inboard?

Stu Walker

Light air spinnaker trim

by STU WALKER

As the spinnaker may not be usable on a tight reach in light air (the apparent wind is shifted further forward – boat speed relatively high compared to wind speed) and it may only be set on a broad reach or run, a full sail is desirable. The fuller the sail the more stable it becomes, the more easily it fills, the less readily it collapses. (Energy expended in re-expanding a spinnaker is energy lost.) The light air sheets should be rigged and, if an option exists, they should be led from leads 3-5 feet forward of the transom. The pole should be set low on the mast so that the luff will be full initially and the sail more inclined to fill as it is set.

The critical element in setting in light air (any air?) is to initiate flow on the leeward surface of the luff. This

LIGHT AIR SPINNAKER TRIM -- continued

means that, as the sail goes up, the sheet must be fully released and the guy overtrimmed. Once the luff is obviously aback, the pole can be eased forward until the leading edge fills. Then from a luffing state the sheet is trimmed until the entire sail fills. Three factors aid this result:

(1) the boat is borne away *gradually* and, even if the leg is a run, not headed below a broad reach until the spinnaker is filled;

(2) the jib sheet is released as the mark is rounded (a stalled jib will prevent the spinnaker from ever filling);

(3) a preventer is rigged to prevent the pole from coming back without the spinnaker tack.

As soon as the spinnaker is filled the boat can be brought to its ideal course, the jib can be dropped (preferably without scrambling onto the foredeck), and the mast pulled forward – raked forward of vertical (not to achieve balance as in heavy air, but to get the spinnaker away from the main). The mainsail should be set full (outhaul and Cunningham eased, mast straight, vang tight) and the boom trimmed at a closer than usual angle of attack (the apparent wind is always shifted forward in light air and the downward course must be relatively high on the wind). Readjust the pole height as necessary to keep the tack at the same height as the clew (better too low, to keep the luff full, than too high in very light air).

Trim on the run is based upon two principles:

(1) the helmsman can maintain spinnaker trim better by altering course than the sheet-man can by trimming the sheet and;

(2) as the helmsman wishes to alter the course continuously he must lead the way and the sheet trimmer must follow.

With a minor decrease in wind strength or the slightest sagging of the spinnaker luff, the boat can be headed up until the sail lifts in its entirety. With a minor increase in wind strength, the beginning of a folding of the luff, the boat can be headed off, to gain position farther to leeward. The sheet trimmer must follow the boat's lead. With a greater decrease in wind strength, the pole may have to be eased farther forward (so the boat can sail higher) or even dropped to a lower level. With a greater increase in wind strength the opposite adjustments may be indicated, so that the boat can be taken down as far as possible in the gust. In addition to responding to changes in wind velocity, the helmsman will respond to changes in wind direction, following the wind, maintaining the same sailing angle (until a major lift that requires a jibe occurs). The boat is continuously sailed high enough, but no higher than is necessary, to keep the air flow attached to the leeward surface of the luff of the spinnaker (so that the luff at least is unstalled). Only in moderate to heavy air can the spinnaker be sailed completely at the stall.

The angle of the pole to the centre line rarely needs adjustment while running. It is better to leave it alone and sail the boat so as to keep it at the proper angle to the wind. Then compass headings indicate wind shifts and the appropriateness of a given jibe. In general the higher on the wind the boat is sailed and the stronger the wind the higher the pole can be set. It should always be set approximately perpendicular to the mast but a 15° variation from the horizontal is acceptable.

More on jibstay sag

by SAM MERRICK

"The jib stay always sags to some degree." "Always" is the key word – as he says, the weight of the stay and the sail sags the jibstay even if nothing else does.

If you have any doubt that the jibstay (headstay plus jib) is expected to sag, lay out your jib on the floor and stretch a string from head to tack. You will see that for most of the string's journey, it will be "away from land" – the luff will curve away from the string as much as two inches, demonstrating that your sailmaker expects sag when he designs your sail. In addition, he has made a guess as to *how much* sag will be produced under a norm of sailing conditions and adjustments by the crew, and then designs the sail to fit that amount of sag. The result under sail is what Walker's piece calls optimal shape. But because of constant changes in wind velocity and wave patterns, there is little likelihood during a race that the attained shape will conform to the sailmakers guess. Success at Soling sailing is significantly dependent upon attaining a shape as close as possible to his guess – that is, you must constantly adjust the sail so as to have it conform to its design (together with its own capacity for adapting) despite the elements at work to prevent that. Adjustment is critical.

The fundamental fact about sag is: the more sag the fuller the sail – the less, the flatter. During your learning period, one way to read amount of sag is to attach a wire one-thirty-second inch to the headstay intersect point on the mast long enough so it comes about two feet from the tack connecting point – the gap to be bridged by a light shock cord under sufficient tension to pull the wire straight. A flat jib is good in drifting conditions (0-3); full is good in the mid ranges (2-15), then flatter again in higher number velocities. Rough water and/or heavy crews allow "full" to be desirable longer. It is not the purpose of this piece to examine what shape to attain, how much twist, or the depth of the cord between luff and leech. But in passing, note that the effect of changes in wind velocity on the amount of sag is exactly wrong. More wind makes more sag, making for a fuller jib. It is therefore the sailor's task to make rig adjustments to bring shape

MORE ON JIBSTAY SAG – continued

and wind velocity into alignment. And since velocity variation is always constant, adjustment must be frequent. Not only does more velocity push the sail harder (causing sag), but more tension on the jib sheet is necessary and this, in turn, increases the sag quite independently of the velocity effect. And, to the contrary, lighter air demands easing the jib sheet, reducing pressure against the sail – causing less sag and therefore a flatter sail.

Adjustment potential is limited by the operation of the class rules specifying shroud and stays allowed and their attachment points. A masthead backstay is allowed but no runners or intermediate stays. The headstay intersect point on the mast is roughly 6 feet (1.7 metres) below the top black band. Pressure on the headstay (i.e., sag) will pull the mast out of column – bend the mast (particularly the upper part). If the mast is new, or at least has not had much heavy air drill, it will be stiff and thus resist variations in pressure against the stay. If it is older, it is more likely to pump and disrupt the attached flow across the jib. (Note: an old Soling will be rejuvenated by a new mast.) Clearly stiff is good, and internal stiffening should be considered if the spar has become limber. Putting tension on the backstay offsets pressure on the headstay and reduces sag.

Backstay tension is therefore a principle weapon against sag – because it also affects the shape of the mainsail. Its use for controlling sag cannot ignore adjustment parameters of the mainsail. At its extreme, lots of backstay will turn a mainsail inside out (stress lines from the hounds to the outhaul), but there are lots of lesser stages of mast bend that the main cannot tolerate given certain conditions.

Mainsheet tension, and/or its sometime helper vang tension, may also counter jibstay *through the sail.* The typical "flat" main designed for a relatively straight mast necessarily depends on mainsheet tension to counter sag – trimming hard enough to make the backstay slack! But here again lots of tension may result in undesirable effects – for example, a tight leech. It may also prevent twist when conditions warrant.

At the light end of the wind scale, there are occasions when more sag is called for than will be permitted by the backstay tension needed to get the mainsail looking good. For example, higher wind at the start of a race might dictate a "full" main requiring lots of backstay. If the wind goes light (4-7), the jib becomes too straight. The remedy is to use the spinnaker halyard as an additional headstay under enough tension to have the jib stay slack. Experimentation with this technique can be astonishing. I have seen jibs look like ocean racer's bloopers and get good speed and pointing.

In closing this rather meandering and incomplete discussion, I will have to report that understanding is only a very distant capability of putting it into practice. Lots of sailing is needed if the factors described here are to fall into place through subconscious responses. But then that's why us old fellows, despite our slowing processes, manage to hold our own – sometimes.

The reach to reach jibe

by ROD DAVIS and ED TREVELYAN

Rod: We're going to explain how we jibe in a wind speed of 15 knots. We are coming into the reaching mark with a sheet over the boom. We don't use tweakers because we're afraid they'll get caught on something during the jibe. At 15 knots Eddy plays the vang and I've got the spinnaker sheet and we're both . . .

Ed: We both try to hike as long as possible. I ease the vang so that when the jibe is completed the boat is not in danger of spinning out.

Rod: At the last second I hand the spinnaker sheet to Eddy, unhook, and step up to the spinnaker pole. It's important for the forward man to get up in position very quickly. I like to be on leeward side facing forward wedged between the shroud and the mast. You want to get into this position at the very last second and while the boat is actually turning because your weight on the leeward side . . .

Ed: Now as Rod steps up on the foredeck, I begin to square the guy . . . I also ease the sheet to a point where the leeward clew is maybe a foot or two past the shrouds (then cleat it). I square the guy as hard as I can by facing with my back to the mainsail and bracing my foot up on the weather combing and pulling with both hands on the guy. This squares the guy all the way back to the shrouds, in effect stretching the foot of the chute across the head stay and sort of choking the spinnaker. This keeps the new guy, which is still on the leeward side, from skying up in the air and helps Rod to reach it.

Rod: I unhook the pole at both ends at the same time (off the mast *and* the spinnaker sheet) just as I'm reaching for the guy, the trip line on our pole is continuous so you can do that with one hand. Once you get the pole on the new guy quickness is very important. You need to push the pole out as fast as possible because you have the lee of the mainsail to help you and soon the main will be across and that advantage will be gone.

Ed: Sometimes when Rod is reaching for the new guy and I haven't squared the pole enough, the chute will tend to sky up into the air and the new guy will be out of Rod's reach. In this situation, Rod will yell to me and I will jump up and grab the guy for him and maybe Robbie will also help. When Rod gets the pole hooked to the new guy, I start easing the new guy forward – but only as much as he needs. I want to let it forward synchronously, as he pushes the pole out. I will give him just as much pole as he needs but not too much.

If the clew of the spinnaker gets to the headstay prematurely, this will tend to put too much load on the pole and it will hinder Rod's attempt to get it on the mast . . .

THE REACH TO REACH JIBE — continued

Rod: There are times that you have to make a slam jibe. You're suddenly on a beam reach and the pole hasn't gotten to the mast. It's very important here to brace your back against the mast and use your shoulders to push the pole out instead of trying to use your arms. You have a lot more power there. Our pole ring is a little bit lower than most of the others and this helps me because I can use my shoulders better.

Ed: If in the case of a slam jibe Rod is unable to hook the pole onto the mast (after struggling for a few seconds), it's best to collapse the spinnaker and to allow Rod to quickly hook the pole on the mast. Then I can re-trim the spinnaker rather than having Rod struggle on the foredeck while the boat heels excessively.

Rod: Once the pole is on the mast quickness is again important. I step down into hiking straps (the old style with just a strap going across) which I can step into and hike immediately without having to hook up. Then the spinnaker sheet is transferred from Eddy to me and Eddy starts playing the vang again. The two jobs require a little bit of different skills. The forward man just has to be quick. Quickness is a lot better than strength because if he gets up and does his job and gets it right down and there won't be any problems. For the middle man it's a combination of strength and co-ordination watching the forward guy do his job and helping him out like easing the guy when he's pushing the pole out. A normal jibe when things go right takes about four seconds. When they go wrong, oh, about 25 minutes.

Hyères 1988

Robbie: Stuart, I hope this is what you wanted. The information that you just got from Eddy and Rod has come from 2 years of practicing and trying to perfect all the manoeuvers. The one thing I suggest to people that want to get better in their spinnaker work is practice and that's what we've done by setting marks up, setting up short courses and trying to get the crew work down which we feel is vital.

Tuning with two boats

by STEVE BENJAMIN

(Steve Benjamin, the 470 Silver Medallist skipper in the December 1984 Games, has been writing in various sailing publications about the benefits to be gained from tuning sessions with two boats. What follows are excerpts from his recent piece in the May issue of Sail. *At any level of knowledge, what he says is applicable to improving boat speed in a Soling, just as it was for him in a 470.)*

To a large extent your choice of tuning partners will determine the success of the tuning session. If you take the time and trouble to choose an appropriate partner and to organise a tuning session, the rewards will be much greater. The ideal tuning partner:

- is as fast or faster than you are in at least one condition;
- can be trusted to push his or her boat to peak performance throughout the session;
- co-operates by changing settings or leaving them the same, as the situation dictates;
- shares information openly.

Since your goal is to improve boatspeed, it is of little use to tune with a partner who is slower. Usually your partner will feel the same way, and a good compromise can be struck among teams that excel in different conditions. A light-air expert and a heavy-air specialist can tune together and thereby improve each other's performance in the weaker condition.

In the best tuning sessions, partners first agree on who should change and who should stay the same. If both boats change their settings or their equipment, little is learned. The concept is that one boat changes and evaluates that change against a constant partner. If just one boat does this, quite a lot can be learned. If both boats are constantly changing, neither one will know for sure which setting or equipment produces the best speed.

Sharing information between partners makes the tuning session far more valuable. If one crew makes a change that improves boatspeed, the other crew should be told what was changed. That change can then be tried by the other crew, so that both boats end up going faster. By using this technique more variables can be tried and superior results obtained.

One of the most difficult techniques to master when you begin tuning is learning to start fairly. Assume that two boats are starting a tuning run. The leeward boat should be a half-boatlength ahead and two boatlengths to leeward. Both boats should be moving at about two-thirds their potential speed and watching each other. When the speeds

TUNING WITH TWO BOATS – continued

are equal and the positions correct, one helmsman nods to the other and the tuning run begins. If the starting positions are not as described, one of the following problems may occur:

- the leeward boat will be too close to the windward boat and because of the lee-bow advantage will appear to be much faster;
- the windward boat will start too far ahead of the leeward boat, soon giving the leeward boat bad air and forcing it to foot off;
- the two boats will be too far apart and may be sailing in different wind conditions.

I define a tuning run as a period of sailing that lasts until one boat gains a clear advantage or until no difference can be demonstrated. Usually a difference in speed becomes obvious within 2 or 3 minutes. However, if the boats sail for 5 minutes without one moving ahead, they are close enough in speed to call it even.

To confirm the results of the first run, the boats should start again *without* making any changes. If the same boat is faster, then a third and fourth run should be tried, but with the boats swapping positions. A speed difference that still exists after the fourth run should be obvious, and the slower boat should be the one to experiment. Ideally, the slower boat consults with the faster boat to seek advice and to agree that the faster boat will remain the same.

Sometimes such a large difference in speed exists that the slower boat should make changes immediately, rather than taking the time to do multiple tuning runs. Sailors who are experienced in tuning can sail for as little as 1 minute, realise a speed problem exists, make the adjustment, and begin tuning again with much better speed.

The result of the tuning run can be affected by wind shifts and other external factors that are not related to relative boat-speed. For this reason it is important to swap positions. It is also useful to practice being both the windward and the leeward boat so that you don't become overly used to one position.

Tuning runs should be tried on both tacks because quite often one partner has better speed on one tack. This may be because the boat sets up differently from tack to tack, or because there are different sea conditions on starboard and on port. If one boat is consistently faster on one tack, look for a symmetry problem in the mast, centre board, or keel.

Once the slower boat has made a change, it probably has improved speed and will be either equal or superior to its partner. If this is the case, the partner should now change and also try to improve speed. The tuning process continues in this way, with each partner taking turns, trying changes, and evaluating results. If one boat is consistently slower, the crews should try swapping boats. The faster team may be able to make the slower boat go faster, either through superior ability or by making improvements in tuning.

Sail setting techniques

by MARK BETHWAITE

A pre-requisite for setting up Soling sails in any breeze strength is a set of well-positioned wool tufts. The quarter points of the mainsail back are good locations for leach wools, with corresponding mid-chord wools at the quarter points of a line drawn from the headboard to the centre of the foot. On the headsail, I use a number of wools about 3 feet up the luff from the tack and 6 inches from the tape for steering and a half and three-quarter luff height wool for twist setting. Leach wools on the jib are at the third points.

It is recommended that main and jib travellers be calibrated in degrees from the centre line subtended at mast and forestay respectively. In this way, not only will what I am about to say make sense, but also valid comparisons can be made between boats, especially when two boats are tuning. Perhaps the most significant point I wish to make is the difference in set up between smooth and lumpy water. In light airs (up to 5 knots) and smooth water the jib can be sheeted to about 9° with a slightly eased sheet and clew board position selected to give correct twist such that all wools stream over its entire height. The main traveller remains within 2° of the centre line, backstay applied to give a flat (10% depth to chord) shape and the sheet eased to ensure all wools stream. The vang should be slack and foot tension just sufficient to take out wrinkles.

In similar wind conditions with lumpy water, the former settings will be very slow. The boat must be pointed low and sailed for speed with the consequence that the tacking angle may increase from 80° up to 100° or more. The jib traveller is dropped to 11° or more, sheet moved aft on the clew board and eased as before to give optimum twist as indicated by the wools. The main traveller can be hauled up to 3° to windward of the centre line and sheet eased. The backstay tension should allow a considerably fuller mainsail shape, up to 15%.

Under these conditions (indeed most lumpy water conditions) it is not possible to have all wools continuously streaming due to the changes in apparent wind created by the fore and aft pitching of the mast head. Other than in long period waves, then sheets can be adjusted on a wave by wave basis, a compromise on wool streaming must be sought and that the sheet tension, traveller position and backstay combination give the best "feel". Again, the vang should be slack, but the foot tension eased to fill up the foot area more than in flat water.

The ball game changes with an increase in wind velocity up to about 12-14 knots, at which stage both crew will be over the side. In flat water where high pointing can be achieved, the jib traveller can come in as close as 7.5°, and be sheeted more tightly as the breeze increases, with

SAIL SETTING TECHNIQUES – continued

consequent clew board adjustment forward, again all as dictated by the wools. The main is sheeted on the centre line, block to block (mast raked to suit) and trimmed flat with the backstay. Some vang may be beneficial to flatten the lower half of the main and thus reduce backwind resulting from the close jib sheeting angle. The foot tension should be firm for the same reason.

For similar wind and lumpy water, I would suggest 9° with the jib and 2° with the main traveller with again a considerably fuller mainsail camber. As with lighter wind, not all wools will stream all the time and a compromise must be sought. The vang should not be used until the boat becomes overpowered and the foot tension should be only moderate in order to retain drive in the lower half of the mainsail.

As the breeze increases still further, the importance of wool tufts diminishes, and the boat will TELL you in no uncertain terms what is required. The general rule of flatter sails for flatter water is still valid but sheeting angles may be reversed, i.e., closer in lumpy water than flat with sheets eased more than in flat water. Lack of power to punch through waves should be corrected by less twisted settings of main and jib, lack of gust response (acceleration) by more twist to open the slot and reduce weather helm. Increasing vang tension also will assist gust response as will the playing of both main and jib travellers. Foot tension, of course, should be maximum.

Having said all that, which is not exactly original, several other points need to be made. I think that, in general, a "flat" main should be used in lumpy water up to at least 15 knots to keep movement and "life" in the rig, so that the rig responds to the movement of the boat through the waves. Other than in light air, a full main is fine for all flat water sailing and is best for all sailing over 15 knots.

Weight positioning in the boat, both fore and aft and sideways is important in light to moderate air to maintain an optimum angle of heel and to keep the weight of the crew concentrated over the keel, to reduce resistance to pitching whilst also lifting the broad rear sections somewhat.

Once the boat is set up well and all other factors are equal (are they ever?) the most important single determinant of boat speed, particularly in lumpy water, is steering. This is a technique which can't be quantified as can be sail settings, etc., but the only advice I can give is to try and achieve some empathy with the boat – try and sense its reaction to meeting the next wave higher or lower, faster or slower, heeled more or heeled less. Thus steering and sail trimming are inter-reactive; each should influence the other until not only does the boat feel right but it is faster than the competition.

Above all else, the most important thing to do is to go out and practice, a philosophy I can preach but not practice at present with my boat in Sydney and myself in Melbourne. Speed, boat-handling and crew-work all improve with practice – it is the only way to approach a major regatta if you are at all serious about doing well.

Pusan 1987

Using flat mainsails

by IAN MACDIARMID

The Soling needs two mainsails (Ed: If shroud tracks are not installed), one flat and one full with a large difference in fullness between them. The reason for this is that a Soling only has two jibs to get it through its racing wind range. For this same range the Dragon class requires three genoas, and an ocean racer four and in some cases more.

The flat main was designed for light winds, or light to medium winds with rough water . . . up to 15 knots if the water is very rough. This flat main has a very small luff curve and because of this it will set up well on a nearly straight mast.

You can start by setting this sail in drift conditions with a mast bend of 25 mm, which gives the rig a very soft and responsive forestay. This rig, even in light winds is very ACTIVE. The whole rig moves around – the forestay sags fore and aft and sideways while the mast bends and straightens in response to waves and wind gusts.

This movement creates a rig that will breathe. The jarring action of the boat hitting a wave will not empty the sails but they will sag off a little and then spring back. This movement should be helped by the crew easing the sheets in anticipation of rougher water ahead, then trimming them back in as the motion of the boat settles down and speed increases.

The flat main has advantages other than that of the active forestay rig. This small luff curve main will have a greater projected area for reaching and running. When you have no mast bend at all, the sail sets with the leech 100 mm wider than the full or heavy air mainsail. Because this reach extends out past a line from the edge of the headboard to the clew, it forms a sail profile that can be easily powered up by sheeting on a little harder.

A noticeable feature of the flat main is that it is very flat in the head. This flatness gives the sail gust response by not allowing the upper leech to become too powerful. It will open when a gust hits and close naturally as the gust eases.

In drifting conditions, tension the backstay to give the mast 25 mm of bend, then tighten the foot of the main out to the black band and bring the traveller all the way to weather. The downward pressure on the main will now be the weight of the boom and the sheet will simply trim the sail in and out. We don't begin to use the vang until the wind increases to over 3 knots, and then only applying it gently to keep the boom down. With this technique, the sheet will not need to be adjusted ALL the time as the leech will respond to variations in wind and water.

As the wind increases to around 6 knots, the vang is used to keep the leech looking right until the forestay begins to move around too much. The traveller is then eased down to centre and the sheet trimmed until the forestay is firm. The outhaul may be eased to fill out the bottom of the main and the vang eased.

The maximum that the forestay should be allowed to sag is 100 mm as this is the amount that most jibs are designed to absorb. At 10 knots your crew should be looking at the jib in view of a change to the flatter or heavy weather jib. This may have to be done earlier if the sea is very flat.

At between 6 and 10 knots is also the time that one of the Soling's oddities becomes apparent, namely the amount

1983 World Championships

of mainsheet tension that can be used when the boat is at full speed to achieve extra pointing height. The top leech ribbon can be stalled 80% of the time whereas in most other yachts and all dinghys, the top ribbon must be kept streaming continuously. With the Soling the bottom leech ribbons will not stall because of the increased flow around the leeward side of the main generated by the jib. If however, you sail into badly disturbed air, it will be necessary to ease the main and sail with the top ribbon flowing until the air is clear.

When a Soling is fully powered up (8 to 10 knots of wind) it is time to start using the Cunningham eye. It should be operated by the crew with the best FEEL and observation. Once the boat is fully powered, tension can be applied to the luff to remove the horizontal wrinkles, further stretching the cloth and depowering the sail as needed.

If it is observed that lighter winds are approaching, the Cunningham should be released completely, powering up the main before the crew move their weight inboard. This is important: power up before the wind eases – power down after the wind increases.

It is recommended that the Cunningham be a 4:1 purchase with the first part made of 3/32d 7x19 stainless wire and the remaining tackle of ¼d (6 mm) soft line. This should enable the luff to return up the mast in light conditions. "Teflon" spray applied to the lower mast track area will also help.

The Cunningham is perhaps the most useful power up, power down adjustment on the Soling. Its action is to move the position of maximum depth forward, rounding up the luff of the sail and straightening out the leech. In doing this the sail is transformed from a tight leeched, high lift and high drag sail to a free leech, low leeway and low drag sail.

Rudder pin warning

by LARRY BOOTH

The only thing that holds your rudder to the boat is a ¼ inch diameter by 1¾ inch long stainless steel pin that goes through the tiller head sleeve and rudder shaft above the deck. This pin can be removed by simply knocking it out with a hammer and punch.

As long as the tiller is in a horizontal position, the pin is prevented from movement by two flanges connected to the base of the tiller. But when the tiller is in a raised position beyond about 30° to the horizontal, nothing is preventing the pin from moving out of the hole except friction between the pin and the rudder shaft.

Under normal conditions this is not a problem because the friction is adequate to hold it in place. However, trailering the boat with the tiller in a slightly raised position is another matter.

Upon leaving the Canadian Olympic Regatta at Kingston one year, we inadvertently tied the boat down with the tiller going over the wooden bolster for the mast instead of under it, as we normally do. Eight-hundred miles later when we arrived back in Milwaukee we were shocked to find that the road vibrations had worked the pin out and it was completely gone – so was the rudder and its shaft! They had fallen off somewhere along the way and we never heard a thing.

If you leave the rudder on when trailing your boat, always be certain it's tied down in a horizontal position. Many people take the rudder off completely for travelling to avoid the additional possibility of another car running into the rudder from behind. I think this is the preferable method.

One word of caution if you remove the rudder. The edges of the rudder are very brittle and it does not take much to chip off a corner. Be very careful not to bump it against anything and don't set it down on a hard surface. It is heavy and awkward to handle, so take extra care.

Measuring jib shape

by IAN MACDIARMID

Firstly you must stretch up your jibs using an old spinnaker halyard as a forestay and measure the depth of cord, angle of attack and angle of exit using a constant forestay sag of 65 mm. The jib is hanked onto the wire and held up by a rope as a jib sheet at the clew.

With the jib leech pulled straight and the foot set with a 160 mm sag in the foot of the heavy 5.6 and 220 mm sag in the foot of the light (as the foot is set on the boat with the foot set 50 mm outside the rib on the deck), you can now measure the cord depths across the sail. By using a light 3 metre long straight edge and a tape measure, calculate the cord depth percentage at three position at 90° to the leech. The second step is to measure the angle of attack of the luff by using a square with an adjustable lever arm. Do the same for the leech.

The leech is very important as it will tell you how old the jib is getting. Its straightness changes rapidly after only four races making the boat much harder to steer in moderate to heavy winds.

This record of jib shape is vital information because you FINALLY have a record of what you know is a fast or a slow sail!

Once the angle of exit has changed 8° from straight the jib has finished its racing life. Many jibs that I have seen (and measured) would never be fast even from new. Fast Soling jibs, even dating back to the Worlds in New York have always been the same shape across the cord, the only difference being the amount of hollow cut in the luff to allow for forestay sag. Jibs with rounded leech shape (more than 8°) perform well only on small lakes where very flat water is encountered and only between a wind range of 6 to 11 knots. The moment the boat has to be steered around more than the very small amount that is required in the flattest of water, it will be slow. I can explain this by saying the leech ribbons stall out much too easily.

Double jib snaps are used more for changing the angle of attack of the luff than changing the fullness. When you have chosen the wrong main or jib for the conditions, you can change the depth and angle of attack to a respectable combination and possibly save yourself from a disastrous result. (In Travemunde Woche one year we changed our main sail on the second reach in race 3 from a flat to the full because the wind began to increase past its range. We went on to win! This is only emphasing the need to be flexible in your thinking and be organised enough in the systems on your boat to do what is required when needed. It is no fun returning to the bar and telling the crowd how you may have won if you had had the other main or jib on.)

Everybody is worried about forestay sag, only because someone told them it was a bad thing to have. Forestay sag can be used to advantage! If the stay sags in the middle and we ease the jib so its leech sags a corresponding amount, then there is really no difference. However, you can use a very much fuller main sail and have no back winding – so more power. This can be used to enormous advantage in light to moderate winds with rough water.

We learned a lot from this in a very short time. When someone is faster than you in a race and you don't know why, then you can start by stepping onto his boat and

MEASURING JIB SHAPE — continued

comparing shroud tensions. If there is a difference try his tensions next time you sail in similar conditions.

When you find excellent speed in any wind range, write the shroud tensions on the bulkhead so you do not lose them! It will still be fast in 10 year's time, the same way a fast sail will be fast in ten years if you know exactly what shape and depth it was.

We adjust our shrouds each time the wind changes more than 4 knots or the water significantly changes. We use Elvstrom shroud adjusters at the deck so the shrouds can be adjusted any time it is necessary. In this way shroud tension can be changed when in close company and evaluated on the spot. The Abbott system of having the adjusters on the cockpit floor is ridiculous.

P.S. Our light jib draft is 15.5%, heavy 12.25% set on a 65 mm sag.

Techniques

from September 1979 Soling Sailing

Ball bearings in travellers

Sooner or later the deck strap that rides the car on the main traveller will show the strains of wear. Suddenly you will have no main sheet. A quick temporary fix involves drilling a small hole through the track and using a bolt to fasten the block at the centre line. But be careful about drilling holes in the track and not filling them later. Such holes permit the ball bearings to escape one by one.

While we're at it, ball bearings need special care — they have a way of running off somewhere during the removal or re-installation of the traveller cars. Such hazards can be avoided by using the black plastic tape which we use for everything else. For removing the car, gently stick 6 inch lengths of tape on both sides of the vertical surfaces of the track. Work the car to the track covered by the tape. Then bring the ends of the tape outside the car and firmly stick them together overlapped. With a little working, you will be able to slide the car, wrapped now in tape, down the track and off without a single ball escaping, since they will be held into position by the tape. On the return voyage, the tape should be applied sticky side toward the bearings. You will find it easier to do so in order to cover one side of the car (laid sideways) at a time and wrap the tape around the car before inserting the bearings and rings on the other side. This allows returning the car to the track with the non-sticking side toward the track. It is easy to get the tape off when the car is safely captured on the track.

Another simple solution is to slide the car off onto a short segment of extra track and tape it to the track.

Rudder and tiller play

Over time, the various links between the tiller and the rudder will wear or weaken and produce play which is most undesirable. Abbott's advice is to keep the bolt well tightened — constant attention is needed to do so, because it will loosen in use. If that happens, watch out.

Despite keeping the bolt supertight, play in the system will occur. If the bushings at the top or bottom of the rudder post are the cause, major surgery is necessary. But there are two other causes which can more easily be eliminated. The holes in the casting can be shimmed if they become elongated (by not keeping the bolt tight). The other cause is elongation of the hole which contains the pin in the actual rudder post. If the pin gets loose and drops out, the rudder will be lost. You can approach this problem by drilling a slightly larger hole and using a new pin — this is machine shop work because of exacting tolerances required.

Mast collar

To keep the bottom of the mast from spreading or splitting, it should be surrounded by a stainless steel band Some mast steps do not permit this band (collar) to be fastened to the mast by rivets or bolts (as they would protrude internally in the way of the step). To keep the collar in position, a wide, multi-layered band of tape may be applied above it.

Fibreglass tape may be used for the same purpose or with a few carbon fibres included may substitute for the stainless steel collar itself.

Tiller extension

The tiller extension tends to drop beneath the level of the tiller and as a consequence the end of the extension may drop beneath the cockpit coaming. This may have disastrous results if when attempting to turn the boat to windward, the extension jams beneath the leeward cockpit coaming. A 3-4 inch diameter, one-eighth inch aluminum disc (round or rectangular) may be fastened like a washer between the tiller and the extension. This will keep the extension from dropping below the horizontal and prevent the cited disaster.

Changing the jib sheet attachment

(In response to suggestions from Al Starratt, Buddy Melges and others.)

Attach a short length of light line so that it dangles from the forward edge of the clew board and secure it to a cam cleat mounted on the aft edge of the traveller (one each side) when changing is required. Alternatively lead a line

TECHNIQUES – continued

ending in a hook up from the deck aft of the traveller (one each side) to be attached as required. Such auxiliary lines can also be useful if the jib sheet fails.

Checking wind direction

Use the jib (when it settles in the mid-line) as the indicator. Draw a long, carefully measured lubber-line on the deck forward of the compass to make sighting easier.

Rehoisting an unpacked spinnaker

To minimize twisting as the halyard goes up, leave the sheet free but pull the guy around rapidly.

Jib traveller settings

Maximum in (6½°?) at 4-12 knots in smooth water. Farther out in very light air, heavy air and in waves. The luff of the main should always lift slightly from the air flow off the jib leech. Rarely need to go more than 4 inches farther out than maximum in.

Spinnaker stowage

The spinnaker storage lines should be rigged so that the spinnaker (1) can be readily pushed into it as the spinnaker is lowered and (2) held within it, so that it cannot escape thereafter. This means that the wall of the bin facing the cockpit should be moveable, its upper edge held up under the deck when closed and capable of being pulled out and down when open. The best way to achieve this is to use a piece of aluminum tubing along the upper edge of the bin and to run a long piece of shock cord through that tube. The shock cord should extend several feet either side of the bin and run through small blocks. A hook can be attached to the middle of the tube to facilitate opening the bin and when hooked to a pad eye on the cockpit floor to keep it open (while the spinnaker is being stowed).

Getting numbers off sails

by VOICE OF EXPERIENCE
***May 1981* Leading Edge**

The problem

If you get a different boat, the numbers on the sails you keep will have to be changed. Modern adhesives used by the sailmakers don't make the job easy. Many sailmakers who have not had much call will look at you with little enthusiasm – because they have tried to remove them the way I did.

The way not to

Start by pulling the number off. Little by little, most of the number material will come off. Then get acetone after the adhesive – it will get sticky and so will your hands. Then get paint thinner, a cloth and rub. Get some steel wool and finally the adhesive shows signs of giving up. After several applications and lots of elbow grease, one number will have been removed – 29 to go! You start on the second, but after a while you notice the first one's area is dry but still sticky. Another application and a new cloth and the job for one is finally completed.

The right way

Start by turning the sail over and spill a little thinner. Work the thinner so that the back of the number is visibly wet. Let it sit for a few minutes. Turn the sail over and peel. The number and almost all of the adhesive comes off in a nice sticky mess. With a clean cloth saturated in thinner rub off the residue adhesive and then dry it off with a cloth. Easy.

Soling tips

***from February 1986* Leading Edge**

I often get the feeling that not all of the pearls of wisdom *Leading Edge* puts before its dear readers every three months gets read. In the last issue, our President, Joe Hoeksema, had some helpful observation on the subject of reference marks (tape, whipping line, magic marker).

I refer to Joe's observations to urge you to go back to the November issue to re-read and absorb the lessons, and to apply the markings he suggested. I would like to recommend an additional mark for application to the mainsheet line. It makes little difference where such a mark is placed, as long as it is visible and in some easy reference to one of the sheaves with the main trimmed at its most effective position for a median wind of the day.

Why is this marking important? Given constant changes of wind velocity and sea conditions, a mark on the mainsheet is not to be the setting for constant use, of course. Instead, it is useful as a *point to return to* for the many times during a race when there is too much taking place for the fine adjustments to mainsheet tension which are desirable but need time and concentration to attain. This mark is then simply a point before making the final "click" or two in the ratchet. In light of the increased use of "flat" mains, where mainsheet tension that is more than an inch or so "off", can be very detrimental to boat speed, the importance of a quick reference point is apparent. Starts, buoy roundings, tacking contests, ducking traffic, are all occasions for such an assist.

Marking up your Soling

by JOE HOEKSEMA

With our first Soling we thought that having a lot of reference marks and tuning guides would be helpful. So we put these stick-on rules and number guides everywhere and marked up each line with multiple and various colours. We soon discovered, however, that we almost never used these guides and that most marks we had made were useless, or at best, confusing. When we bought our new boat in '82 we decided not to use any marks or guides, but realised quickly that this wasn't fast either. Finally, at the clinic prior to the U.S. Championships in New Orleans that year we got on track when Dave Perry, Peter Isler and Dave Curtis discussed what reference marks they put on their boats and how they used them. Since then we've paid a lot of attention to how the experts "mark up" their boats. I'd like to share some of their better ideas with you.

Marks that are a must

- *Spinnaker sheets* – The single most important mark you use on a Soling is the one on the spinnaker sheet. It should be highly visible and placed at the point where the guy is cleated on a close reach (note: just off the headstay) in moderate air. Dave Perry says to use whipping line here for two reasons: First, with Kevlar sheets the cover slips over the non-stretch core and what you mark is the point on the core. Second, the person(s) who handles the sheets through the gybe wants to be able to feel the mark and not have to take their eyes off the spinnaker to look down to find where the new guy is to be cleated. Remember, one mark is all that is needed here. Extra marks for guy trim on the run are never accurate and depend on whether or not twings are used. You'll soon get used to looking at one mark and how far it is from the cleat for various conditions.

- *Backstay* – The backstay is marked so that it can be quickly trimmed at the leeward mark to the upwind setting. The mark should be on the backstay just above where the stay exits the deck. The three most frequently used methods are:

(1) a clear plastic tube over the backstay

(2) multiple marks either painted on the backstay or with yarn threaded through the wire; or,

(3) a small batten with multiple marks on it that is affixed to the transom.

- *Forestay* – The fine tune for the forestay should be marked where it is cleated for a known amount of rake. This should be an average setting and adjustments can be made in or out from this benchmark for different mainsails and conditions. Having different marks for full or flat and different settings results in a line so marked up that it is confusing. As a rule we find that the fewer the marks on any one line the better. One mark is the simplest and usually sufficient.

- *Marks on double-ended leads* – For the purposes of trim adjustments marks on these lines are obviously useless. But a single mark on each of these leads for the purpose of pre-race set up and proper distribution of lines port and starboard can be very helpful, especially on two or three race days. What happens on the race course (with marks to port) is that several controls are eased at the weather mark on starboard and taken up at the leeward mark on port. After three or four mark roundings all the lines end up on port, while on starboard the lead is all paid out and can t be eased. The proper pre-race set up therefore is to have most of the line for these controls to starboard with just enough

MARKING UP YOUR SOLING — continued

on port to adjust sail shape. On our boat we have a mark on each side of the double ended leads for the backstay, jib car, vang, Cunningham, outhaul and jib halyard and tack thus ensuring proper distribution of line before the start of the race.

- *Sail shape adjustments* — If you look at the experts' boats you never find stick-on rules or measurement marks on the mast next to the Cunningham, or on the jib or main travellers, or on the boom for the outhaul. The reason is that when you adjust the Cunningham you look at the draft and luff wrinkle, not at where the Cunningham is in relation to a fixed measurement point. In addition, these adjustments already have a clear visible reference. For example, the position of a jib car can be checked at a glance by where it sits in relation to the cockpit combing and outboard to the splash rail. (Melges — ". . . trim the jib to the hump.") The main traveller is adjusted to keep the boom in the centre line and the outhaul is trimmed relative to its position to the black band and sail shape, not to a given number on a tape.

Miscellaneous marks

- *Spinnaker pole height* — We don't mark the pole up or down haul other than to put a figure eight knot in the pole downhaul at maximum pole height. This serves as a quick and visible reference (8 inches from the knot in light air with a low pole and 2 inches from the knot in heavy air close reaching, etc.). In addition the knot prevents the pole from "skying" if the downhaul is accidentally released.

- *Spinnaker halyard* — The only mark necessary here is a mark to let the crew know when they have reached max hoist. This mark should be big and placed about 10 inches from the maximum hoist position. This enables the crew to see when the chute is almost all the way up.

- *Twings* — Twings should be marked at the positions where they just keep the spinnaker sheet beneath the main boom. This mark should be placed on the twing right where it exists from the deck and is easily visible. It should *not* be placed under the deck where the twing is cleated.

The right reference marks, properly placed, can give you an added edge while racing. Keeping the number of marks to a minimum and the system of marking simple will make it more likely that the marks will be useful.

Sail selection and use

by DAVE CURTIS

The modern Soling sail inventory (regardless of the sailmaker), is usually two mains and two jibs as follows:

Light air main

Usually non-yarn-tempered, minimal luff curve, capable of being set on a straight spar for light air but also able, because of the soft cloth, to be used with up to 5 inches of mast bend in moderate air. This sail is commonly called a flat main, but is really only flat in terms of luff curve.

Heavy air main

Usually yarn-tempered with deep luff round designed for use with 5-12 inches of mast bend depending upon wind velocity and sea. This sail is commonly called a full main, but is full only in terms of its luff curve. When the mast is bent with the full main the wind "sees" a flat sail (hence better for higher winds). More importantly, with increased mast bend (more backstay tension) there is increased jibstay tension and less jibstay sag.

For winds of 12 knots (or less) that will diminish, the

SAIL SELECTION AND USE — continued

flat main should be chosen. If the wind starts out around 12 and will increase, the full main is the correct choice.

Light air jib

Usually yarn-tempered, 5-5¾ ounce, capable of being set on a straight jibstay or on a jibstay with moderate sag (impossible to prevent in winds over 5 knots).

Medium (heavy air) jib

Yarn-tempered, 5-6½ ounces, designed to be set on a jibstay with considerable sag.

For winds below 12 knots with the flat main (which below 5 knots permits no jibstay sag and between 5 and 12 knots, only moderate jibstay sag), the light air (full) jib should be used. Backstay tension should vary between none in 0-2 knots to 5 inches in 12 knots (or as much as the main will take). If you are caught with the light air (flat) main in winds above 12 knots, jibstay sag will be excessive and your only hope is to switch to the medium jib (designed for greater jibstay sag).

For winds above 12 knots with the full main, which, because of the increased mast bend, is associated with very little jibstay sag, the light air jib is satisfactory in most conditions. It is almost always the better jib (more power) in winds less than 20 knots and may be appropriate up to 25 knots with large seas (more power needed). In smooth water with winds above 15 knots and in *very* strong winds (above 25 knots?) where higher pointing is possible the medium jib may be preferable. If it is made of heavier cloth it is less likely to have its draft move aft, produce a tight leech, and blow the boat to leeward in a gust. Some full mains can be used even in light air with a very full jib and no jibstay sag.

The major advantage of the "flat" main is that it can be used in its designed shape (relatively full) on a straight mast and, in light air, results in so little jibstay sag that the full (powerful) jib may be used without loss of power.

The major advantages of the "full" main are that the increased mast bend that it demands decreases jibstay sag and that the rig is stabilised by the mast bend. When the boat hits a sea an unstable rig reacts adversely. The mast tends to bend forward as the boat decelerates flattening the main and tightening the jib leech when what is needed is a full main and properly set jib. As the boat emerges from the wave and should accelerate, the mast straightens and tightens the jibstay. So at the time when the main needs to be flat with an open leech to permit acceleration, it becomes full with a tight leech. The markedly bent mast, produced by the backstay and vang tension used with the full main, is much less inclined to flex as seas are hit thereby preserving, to a greater extent, the appropriate sail trim. Some feel that the vang is particularly important in this regard as it stabilises the lower part of the mast which has the greatest effect upon mainsail shape and jibstay tension.

With the full main backstay tension should have a more or less linear relationship to wind velocity. The harder it blows the more backstay is needed. If the boat feels sluggish, has more than a little weather helm, is heeling excessively, or appears to be making excessive leeway more backstay is probably needed. If you sail with less than usual crew weight, more backstay tension, to produce a flatter main with a more open leech will be required. The relationship between main traveller car position and leech tension in heavy air remains an unresolved question. Some, to keep the boat on its feet and driving, prefer to keep the main leech tight through more mainsheet and vang tension while easing the traveller car to leeward. Others, including me, prefer to keep the traveller car in the mid-line while progressively twisting the top of the main off through increasing mast bend (without) additional mainsheet tension.

Interview with Robbie Haines

from May 1987 **Leading Edge**

How much rake should I carry?

My general rule of thumb is to carry as much rake as you can and still have enough to adequately sheet the main. By this I mean have reference marks on your headstay line with light, medium and heavy settings. I used to think that a fixed headstay was sufficient; but now I feel that the boom right on the deck is faster. This will require more rig adjustment, but it's needed, I feel.

Where should the jib leads be set in different conditions?

A good overall position for light to medium (4-8 m.p.h.) is 13 inches out from the middle of the mast. This seems to be a good starting point and 3 inches in or out seems to be the range for most conditions. There have been times when we have been extremely fast with the leads pulled in all the way. This was in smooth water, 12 knots of wind. Crew weight is another big factor in lead position. If you have average crew weight (550-580 lbs.) these measurements are alright. If one sails at 500 lbs., I would suggest easing it out more than pulling it in. When tacking we can't adjust the leads. Some people do, I just haven't tried it. It seems that easing the jib an inch or two seems sufficient.

Where should I mark my backstay so that I can get an accurate reading?

Many people have tried using a plastic tube over the wire with marks. This seems o.k. but I just mark the backstay

INTERVIEW WITH ROBBIE HAINES – continued

with a felt pen or good tape. The drawback with tape is that it's possible to pull the backstay so hard that the tape moves. My mark is usually 2 inches above my maximum backstay pressure. In lighter winds this mark is higher; I just remember the distance it is off the deck.

What is good tape?

We have used the grey duck tape for years. There are, however, good kinds and bad. The bad stuff is the kind that is thicker and has a very shiny finish. We make a real effort finding the best stuff. There are many times we use it for patching ripped spinnakers.

Mast bend, how much and when?

This is difficult to answer. Basically the way I approach this is to give the following numbers. In 8 knots 7 or 8 inches, in 15 knots 10 inches and in light air 4-5 knots about 4-5 inches. This more than anything else varies on crew weight, wind speed, and wave conditions. Use these for the basic set-up. The trick to proper backstay tension is to learn when the sail looks fast, which comes by experience. The learning process can be shortened by having someone show you exactly what is right.

How much jib halyard tension in different wind strengths?

Just enough to eliminate the scallops along the luff is my first answer. Our jib has been designed to be right (draft position) with a limited amount of adjusting. It is better to have not enough tension than too much. In other words, too much halyard is much slower than not enough.

When tacking, should I ease the jib sheet?

Yes, in almost all conditions. We ease it all the time up to 15+ knots. In smooth water it's not as important, but in choppy water it's essential. In the recent Podolak series we experimented with this and found it extremely slow to keep the sheet cleated. The boat needs the extra power out of a tack.

When sailing to weather, where should the weight be? Forward or aft?

My feeling is that it should be forward. When we rigged US651 I tried to keep the crew as close together and well forward. The crew being close is more important than fore-aft position.

When should I pinch or foot in different sea conditions?

In a Soling it doesn't hurt to have the windward telltale lifting. I always have it moving in most conditions. In rough water it's not a good idea, but both telltales should almost never be flowing back. The boat needs to be stuck into the wind. In a breeze, feathering is the most efficient way to reduce power. By feathering I mean pointing to a point where the boat loses power, thus keeping it flatter, which is fast.

Should I heel a Soling or should I keep it flat all the time?

In over 6-8 knots keep it flat in all conditions. Sometimes I have found it better to heel in choppy water but not very much. It is also faster to keep your crew mini-hiked rather than sitting on the deck. This is one problem we had with Lowell and Rodney. In marginal hiking conditions I would let them come in. This is not right. Keep your crew over the side until they are continuously dragging. Watch out crews?

Will yelling at your crew do any good?

Yes. In some conditions. I yell a little bit, but most of the time it only flusters them. After sailing with Melges, even the experts yell at times. Practice is the key. If they know their job, yelling isn't needed.

What is the correct position of the pole?

The general rule is to keep the clew even. If the pole is too low in a breeze the sail will look different. My rule is to keep it all the way up in 10 knots and above downwind and reaching. In lighter winds it varies on your angle downwind,

Vince Brun, Bob Kinney and Robbie Haines.

INTERVIEW WITH ROBBIE HAINES – continued

On San Francisco Bay – manoeuvring before the start

and sea condition. We do adjust this continuously with different velocities.

Downwind, should the middle crew play the guy and sheet?

Absolutely, if he is strong enough. Sometimes it isn't needed, but in California the ocean swell usually makes it vital in the lighter wind ranges. If one properly does this he will definitely be faster. In strong winds we usually pump the chute to get on waves. After that it is illegal to continue it. A Soling is very heavy, and to do this properly takes a lot of muscle. We sometimes take turns pumping the guy. I do it, then the forward man does it. It really takes co-ordination.

In close reaching conditions should the crew be mini-hiked or leaning out?

If both crews or crew can mini-hike, this is faster. It is faster to get the weight low. On our Soling we have a type of hiking system that can be adjusted to let the crew mini-hike or lean. I feel this is important, mainly because of speed, but also visibility. Looking at waves is critical. Sailing with Melges was an experience; he is always looking over his shoulder for the next wave or puff. Upwind, he never looks at the jib, always upwind for more wind; and has no telltales on his jib.

Where should our weight be downwind, reaching?

When sailing downwind, try and move all crew members and yourself forward. This seems faster, allowing the transom to get out of the water. In fact, in some races Lowell would sit on the foredeck. We never notice this to be slower. When reaching in light winds, keep your crew in the normal upwind position. In a breeze, move everyone aft. The middleman should be at the skipper's position and the skipper should be on the after deck. This gets the bow up and out of the water, which is fast reaching.

I have an older Proctor mast, should I buy a new one?

I usually tell people no. The amount one spends on a new rig ($1000) far out-distances the speed advantage of say, a new bottom job. Proctor masts have good points . . . the main one being that it is stiff, and has a minimum tip weight. The bad part is the taper. It is very thick sideways at the top. Now, if you feel that is worth $1000, I recommend buying a new one, for psyching purposes.

Should I wet sand the bottom or keep it shiny?

Wet sanding or a dry finish are both equally fast. I have always preferred wet sanding, but we recently had a new paint job that shouldn't be sanded, and we were as fast as ever. Hull fairness is the important bottom factor. The keel and rudder must be fair, and only block sanding and filling can accomplish this. Lots of hard work for an unmeasurable speed difference. But all these small items add up to a difference.

In most big regattas (three days or more) the boats are required to be left in the water. Should they be sanded or rubbed down?

In warm weather (and warm water) growth starts within hours. We always rub down after the first day. Coral starts usually on the side facing the sun. We sand this and sometimes around the waterline, where oil and dirt collect.

You seem to always have an excellent crew. What is the reason for this?

I guess first-class crews migrate to the winning boats. It is my opinion that if an owner takes time in finding two guys who are willing and can take the time to crew, winning a boat race will come a lot easier. It's amazing what a dedicated crew can do, both for boat performance and skipper psych. Try and get the same crew for every race; unfortunately this is easier said than done. Winning a Soling race is a team effort, no one person should be singled out as the main reason for winning.

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SAILING

Jibing in winds over 20 knots

by SAM MERRICK

The one experience in a Soling that can be intimidating is jibing in over 20 knots of wind. At the windward mark the spinnaker goes up and away you go on a plane headed more or less for the distant leeward turn. You will soon realise things seem more stable (less out of control feeling, while rolling) by heading a few degrees "up" from directly downwind. But, the wind shifts 10 degrees, so in order to avoid more departure away from the course, you realise you have to jibe. The leaders seem to take it in stride, but a boat nearby enjoys what we have termed a "death roll". A death roll while jibing ends up in complete disarray, spinnaker flogging, crew hanging on, and the boat half full of water. What went wrong? The single answer (except for a freak gust or the tiller breaking) was that the skipper failed to steer the boat downwind – he got distracted by more than steering and allowed the boat to round up out of control. To avoid this on your boat, follow these simple steps:

(1) The number one priority is to have the skipper do nothing but steer. He must steer away from their 5 degree "safety" course to directly downwind, to 5 degrees more to get the boom across, to directly downwind again for a brief period – in a flat S tack, then finally to the "safety" 5 degrees for the new tack.

(2) The boat's middle crew is in charge of the mainboom – NOT THE SPINNAKER – during the jibe. Before the jibe, he overtrims the spinnaker somewhat and cleats it. This person also trims the guy several feet as a response to the pole getting detached from the mast and cleats that too. He is now free of spinnaker duties and should be coached, cautioned, and given a mindset to do his job with the main boom completely, with the boom again tugging at the mainsheet on the new jibe. If he hurries to get back to the spinnaker, the boom might not be quite ready to assume its new position and go back just in time for the skipper to be heading into the jibe. Trouble will be on the way then.

(3) The pole man is on his own – doing his own thing. He will get help from the middleman when the boom is safe on its new side. The new guy will need enough easing to allow the pole to be attached to the mast – be aware that he eases it with restraint. An eased guy at the end of a jibe in heavy air is the next most frequent cause of a broach (after bad steering). Cleating the guy and the sheet will be more work for the pole man – but it is safe.

(4) Practice the above in 15 knots so when it blows over 20 you'll have the technique down.

Melges on . . .

report on a seminar conducted by BUDDY MELGES

Racing One-Design Sailboats in top competition has become such a complex game that it is often worthwhile to stop and think carefully before deciding what skill or piece of equipment should receive top priority for next season. When I heard that the Seattle Soling Fleet had invited Buddy Melges to talk, I decided that this would give me a good opportunity to hear what one great sailor views as the top priorities when preparing for and sailing a race. It is hard to imagine a better qualified person. Buddy holds two Olympic medals, one in Solings and the other in Flying Dutchmen and has won the Mallory competition three times. When you consider that he comes from Zenda, Wisconsin, which, as he says, is "a gin mill and a boat company (his) in the middle of a corn field", his record is all the more impressive.

I was not disappointed. Buddy spoke for four hours and had his audience listening carefully the entire time. His talk was lively, full of enthusiastic descriptions of races and, most important, liberally sprinkled with his ideas on how to win a major championship. What follows is a recap from my notes of points that Buddy emphasised or that were new to me.

On learning and practice

Spend more time practicing and studying your sails and the other fast boats' sails than you have been. Before the last Olympic trials, Buddy and his crew sailed three days a week in all types of weather on Wisconsin's Lake Geneva. There were no other Solings, but they often took out a powerboat so that they could get off their boat to study their sails. They sailed throughout the year and, on some days in the depths of winter, sailed iceboats on the frozen part of the lake and the Soling later on open water at the other end of the lake. They put themselves through all sorts of simulated race situations, and eventually they were able to sail with almost no commands needed during tacks, jibes or normal sail. Buddy emphasises the importance of looking at your sail from outside the boat. He feels that there are important attributes of sails that are virtually impossible to study adequately from inside the boat, in

MELGES ON . . . — continued

addition, he is obviously very flexible and willing to learn from his competition. He once sat out a Soling World Championship and just watched how the best helmsmen handled their boats and set their sails.

On experience

He attributes a lot of his success to his extensive experience in high-speed boats on inland lakes. Buddy is an expert iceboat helmsman and races a Skeeter on Lake Geneva whenever there is good ice. He feels that these boats, which can achieve speeds on the order of 100 m.p.h., make one a sensitive judge of the vital relationship between speed and wind angle. He also has won consistently in various scow classes and in the Flying Dutchman. These planing boats provide a bridge between the iceboat and Soling in terms of the rapidity with which boat speed is affected by wind angle and sail trim. In addition, Lake Geneva's large and frequent wind shifts have made Buddy super sensitive to the importance of shifts both upwind and down. Melges, like Elvstrom, does not depend heavily on compasses relying instead on his ability to read the shifts off the water to windward. Practice on Lake Geneva helped develop this skill. "Back on Lake Geneva," he said, "we think compasses are for hunting."

On hull preparation

Buy from the leading builder in your class. Arrange the controls so that they are right where you want them, and neither you nor your crew need divert your attention to use them. Carefully prepare the underwater surface so that you know they are the best possible. He fairs the bottom of his glass Soling using sandpaper on a three-eighth-inch-thick foam sanding block, first with 320 wet or dry, then 400, 500, 600, DuPont hand rubbing compound and, finally a fluorocarbon spray. I saw him devoting many hours to the bottom of his boat at the Kiel Olympics. In addition to providing a flawless finish, Buddy seems to be trying to "one-up" his competitors with his attention to his boat and to use the activity to release his own reservoir of excess energy.

On sails

Look at the sail from all angles, both off and on your boat. Looking up at the main from under the boom is helpful. The angle that the top batten makes to the boom provides a good guide to leech tension. The vang is more critical to boat speed to windward than downwind (on a Soling). Leech setting depends most on the sea condition. In smooth water, little twist is best. In chop, the leech should be eased to allow lots of twist. Sheets can be eased and the traveller brought to windward of the centre line to achieve this. He is of the opinion that twist helps reduce pitching moment by reducing drive high up in the sail. The same considerations apply to the jib — a twisted leech being best in a sloppy sea, and a tight leech in smooth water.

On windward legs

Bunch crew weight fore and aft. He looks at the horizon as he sails, judging the angle of the forestay to the horizon. He sails a scalloped, "gyrating" course, up and then off again. When there are waves, he heads up while the bow is rising on a wave, then bears off just as the crest passes under the boat and sails off as the bow goes down the back of the waves. Heading off just at the moment that the crest is under the middle of the boat minimise the resistance associated with bearing off since both ends of the boat are, relatively speaking, out of the water. If a competitor is nearby, try to point highest whenever he looks over at you. He gave one clue that I am not sure I would even know how to try. He said, "If you can get in rhythm steering with the movement of a pumping headstay, its amazing the speeds you can achieve."

Hyeres 1988

MELGES ON . . . — continued

On downward legs

Spread crew weight fore and aft when riding down waves. Buddy often stands up, studies the yarns on the weather shroud and holds one or both of his spinnaker sheets. He stresses the importance of playing shifts and seeking the best angle to the apparent wind at which to jibe downwind. To windward, you tack on the headers and to leeward you jibe on the lifts. Just as on a weather leg don't go way out to one side, but play the shifts down the middle. Don't change course sharply as that always costs you distance. To check that your course angle to the dead downwind line is a good one, sail 100 yards or so off that line, then jibe and come back to it. At this point see if you have gained on the other boats. Buddy doesn't remember the last time he was in a "dog fight" (luffing duel), but he always tries to arrange his downward tactics so that the other boats are likely to stay bunched or luff one another. He uses aggressive tactics and tries to jam the fleet together so that they will interfere with each other.

Offwind sail trim

The main should be baggy with mast raked forward if possible. A small flat spinnaker often pays off in winds under 4 knots. By all means maintain flow across the spinnaker. "Ventilate" the chute and don't let the air in it become "constipated" due to a tight leech. When the wind is over 12 knots, start to play the waves. On a run in these conditions, heel the boat to windward and "skid" it downwind. "If the spinnaker is not dancing, it's overtrimmed." If the spinnaker luff is uncontrollable (i.e., normal trimming does not prevent its collapsing) lower your pole until it becomes controllable. On reaches a properly cut spinnaker requires that the pole be set at right angles to the headstay. In heavy air when you are about to broach, pump the helm to "give the water back to the rudder" and prevent the rudder from stalling, and ease the vang to free the leech. In winds over 18 knots, he sets his small chute.

At the start

Come in on port tack and find a hole in the line of approaching starboard tackers. Try to avoid having anyone nearby on your lee bow as the windward boat in this position always sails in a header relative to the leeward boat, just as the main on your boat sails in a header induced by the presence of the jib. This can be particularly deadly if you are the windward boat of several packed side by side on the line.

Now let's see: Where can I get a Styrofoam sanding block, a motorboat and the time to practice three times a week!

Gusts and fluctuations – changing gears

by SAM MERRICK

A short recent article under this title by Frank Bethwaite in the British fortnightly *Yachts and Yachting* opens the door (of the mind) to underlying meteorological data which explains the need for sail shape adjustments. What is surprising is the frequency of wind velocity changes which should translate into trimming and slacking all those lines with equal frequency.

As Bethwaite tells us, a recording tower was moored eight miles offshore in the years before the 1976 Olympic Regatta at Kingston. Those who went to Cork will remember it. One of its instruments was an "open scale anemograph" which produced a mass of "traces" of which a few were used to illustrate Bethwaite's article.

One such trace illustrates the point – a typical 10 knot gradient wind (not a sea breeze wind which because it is not so "deep" or high in the atmosphere is less "bumpy" than a gradient wind). Over a 15 minute period, the peak gusts register 12.5 knots, the lulls 5 knots a difference of 75%.

Another trace of "smooth" seabreeze in 15-20 knot range shows 15 individual gusts during a 15 minute period and fluctuations averaging one every 11 seconds! The highest gust was 22 knots, the lowest 13 – a difference of 45%. Going to windward, a boat will experience the fluctuations more frequently than a stationary tower, because it is advancing toward the shifts.

All this seems to suggest a frenzied response in the boat. Modification of the sail plan must be continuous within the bounds of practicality and within the capability of the crew and helmsman to feel the velocity variations. It is clear that the arrival of gusts, which are sudden, is easier to detect than the lulls which are usually on gradual slope downward. To stay alert to such changes requires concentration of a high order followed by the intellectual process of deciding the appropriate response. Intuitive diagnosis and response is a developed skill of the top sailors and they acquire such capabilities after long hours of sailing.

One can call this process changing gears, which, when we drive a car without automatic transmission, we learn to do without thinking about it. Changing gears in a boat as sensitive as a Soling can't be done without thinking about it most of the time.

The light air jibe

by STU WALKER

The run may be the most important leg of the course in light air with variations in boat speed and distance sailed comparable to the beat. The boat must be kept sailing at a high angle to the apparent wind, often as high as 45° above the dead downwind direction. This maintains speed, which is difficult to reacquire in light air, keeps spinnaker from collapsing, which is difficult to re-fill in light air, and most importantly, results in the maximum rate of progress to leeward. The course must be constantly varied to assure that the best co-ordination of speed attained and distance sailed is maintained. The boat is borne away as the wind increases or shifts forward and headed up as the wind decreases or shifts aft. The optimal angle to the apparent wind depends upon the boat, the feel of speed and a certain amount of sixth sense which Sam Merrick sums up as "ventilating the rig". The minimum restrictions are: never bear away so far that the spinnaker collapses (or assumes a J-shaped configuration at the pole) and never head up higher than necessary to keep the boat feeling "fast".

In order to maintain this ideal speed in the direction that is most directly downwind, the boat must be jibed frequently in the many shifts which characterise light air. It should be jibed whenever it is lifted sufficiently so that a course equally high on the wind, but more directly "downwind", towards the leeward mark, can be achieved on the opposite jibe. It may also be jibed beneficially when the course on the opposite jibe can be maintained at an approximately equal deviation from the median downwind course, but within a zone or streak of better wind.

The desiderata of the jibe are that it be completed without losing speed and without collapsing the spinnaker. If this is possible, the helmsman gains a tremendous advantage, becoming able to jibe whenever he wishes and to take advantage of even slight alterations in wind direction or velocity. As turning the boat away from the wind necessarily causes slowing, the jibe should be completed as rapidly as possible. As the boat turns the apparent wind shifts ahead and to leeward — opposite to the direction of the swinging bow. Then, as the turn begins, the original leech of the spinnaker becomes its leading edge and the apparent wind shifts throughout the turn to abeam to leeward, perpendicular to the turn. To accommodate this change in the apparent wind, the spinnaker must be shifted rapidly into a close reaching set on the opposite jibe and maintained in this position until the turn is completed. (Thereafter, the guy can be gradually trimmed aft until the sail is optimally set for the course to be sailed.) This rapid shift of the spinnaker must be achieved without collapsing the sail. Its collapse will result in the loss of at least a boat's length compared with a boat that does not jibe or jibes without collapsing its spinnaker.

To achieve this effect the foredeck man must detach the pole from the sail at the instant the turn is initiated, attach it to the new guy as soon as possible, and push the pole forward to aid in re-orienting the sail to the new apparent wind. The foredeck man can greatly aid the sail trim by judicious manipulation of the pole and should not attach it to the mast until he is certain that the sail is full and stabilised. The sheet man meanwhile has to free the old sheet, feeding it forward, as he rapidly trims the old guy. He must be able to see the spinnaker continuously during the jibe and should keep his eyes on it while manipulating the lines. His duties are aided by light sheets and freely turning blocks. The helmsman should be responsible for bringing the boom across — slowly, holding it in the midline until the boat is nearly up to its new course, and then

A typical light air jibe

THE LIGHT AIR JIBE – continued

easing it out – so as not to disturb the spinnaker. Quick repeated jibes in small boats may sometimes be best managed by the helmsman taking the sheets directly as they come free from the sail and the middle man managing the boom. This is advantageous because the helmsman being farther aft, is in a better position to trim the sail in line with its intended leads and by taking the sheets directly he eliminates the friction of the blocks.

Once the technique has been acquired and the crew well trained in its application, the helmsman is free to exploit the conditions of the light air run. Properly conducted the jibe may even gain speed by producing an artificially increased apparent wind during every turn and by the rapid trimming in of the mainsail as the jibe is initiated (although this results in a transient increase in forward thrust, it must not be exploited to the point of disturbing the spinnaker).

SAM MERRICK comments

For an ice beat sailor, heading directly downwind to the leeward mark would chain him to the wind speed. Yet speeds well over 50 are attained in 10 m.p.h. air by turning the "run" into a pair of reaches separated by a 90° turn at a jibe (no jibe mark, in an ice boat race). The ice boat typically heads "45° above the dead downwind direction" and does so with a tightly trimmed mainsheet (as though it were going upwind). Unlike a sailboat with its drag from moving through the water, the near frictionless runners on ice allow very substantial increases in apparent wind as the boat itself moves across the ice.

Perhaps the ice boat analogy will help the thinking sailor become aware of the reason for "freshening" as the wind gets lighter – that is, heading higher or further away from the "dead downwind direction". I make the point because it seems to be one of the most difficult of concepts to learn and practice. Many sailors who have heard the message will head high enough to fill their spinnaker, but not high enough to increase the apparent wind. It seems to stick in their craw to have the spinnaker pole on the headstay on the downwind leg as though they were on a reach – which is of course is what they are.

Big fleet strategy

by STU WALKER

In a small fleet starting at the preferable end (and there always is one) provides a few boat lengths advantage, a position nearer the advantaged side, and/or an opportunity to reach the next header ahead and to leeward of the fleet. In a big fleet starting at the preferable end provides an opportunity to be caught in a crush, to be driven over, to be forced to tack to the wrong side of the course, and/or to be detected as starting prematurely. One cannot plan on getting a good start at either end because one cannot plan on one's competitors obeying the rules. In a big fleet the entire range of possible behaviours must be expected including arriving early, bearing away, colliding and ignoring all usual restrictions. Hailing, objecting, and protesting are to no avail; ultimately a collision, legal or illegal, or the risk of one obviates any advantage which might otherwise have existed.

Standard practice in moderate-sized fleets (unless the wind is oscillating) is to sail the lifted tack until one-half to two-thirds the way to the layline and then when some slight header appears to dig back in towards the rhumb line. One attempt to keep inside and to leeward on the tack back and to avoid reaching either layline until the last possible minute. In a big fleet, even if one has the opportunity to sail the preferred tack towards the layline he is unlikely to find an open slot along which to tack back to the rhumb line. And if he does, he's likely to find that those who continued out to the laylines are sailing over him, often from both sides.

In one race of the World's, I obtained a good start at the port end and congratulated myself upon obtaining the clear air necessary to going the "right" way. However, at the mark I thought I was fourth amongst those coming in on the port tack layline, two others from the far right corner also slipped in ahead! On the final beat in another race I attempted to play the oscillating shifts up the middle. I noticed that we were pulling away from those in the right corner but was amazed to discover that despite a mere 5° net shift their way, I lost about ten boats who had gone all the way to the left. Hans Fogh, who was amongst these, pointed out that although a net shift of 5° doesn't seem like much, when it is combined with more air, it can easily make a ten boat difference. Almost every beat of the 21 at the World's demonstrated an advantage to one side or the other. Going up the middle never seemed to pay.

There are several logical explanations for this observation. The winds at Anzio were seabreeze/weather system combinations characterised by a tendency to shift towards one or the other of the wind sources (depending upon their strength and the time of the day). This condition is characteristic of international championships which are always held "in the open sea", i.e., along shores which tend to produce seabreezes aligned to varying degrees with weather system winds. But big fleets create this effect regardless of the wind for the following reasons:

(1) The wind is so adversely affected by a big fleet, so disturbed within the diamond between the laylines, that only those boats on the periphery have clear air. Big fleet

BIG FLEET STRATEGY — continued

racing, particularly shortly after the start and as the fleet converges at the weather mark or the finish line, is therefore much like light air racing. The middle must be avoided in each condition because there the wind is more disturbed and the boat has to be tacked more often.

(2) "In big fleets someone will always get it right". So says Paul Elvstrom about boat speed in big fleets but the aphorism also applies to strategy. "Getting it right" (except in oscillating winds) always means one layline or the other. In small fleets few will dare go to the layline and those who do are unlikely to have the speed to make good their advantage. The fast boats all play it conservatively, "digging in" well below the laylines. But in big fleets where there are many fast boats, there will always be some who by election or necessity will go all the way to the corners. And if you are going to beat these, you'll have to go there with them.

The advantages of the laylines are, of course, enhanced by big fleet scoring systems which tend to reward brilliance and justify risk-taking. A couple of bullets will win most big fleet events (and there is no doubt these are more likely to be collected from the corners) both because there are significant bonuses for high placements and because a throw-out, usually provided, can eliminate one disaster.

I remember the winning of the 1975 European Soling Championship by Stig Winnerstrom, one of the all-time great corner-shooters. We had close to 20 races started at Alassio to get in five; the other 15 were abandoned because of insufficient wind. Stig was always in one corner or the other when the races were abandoned, sometimes so far in last that we could hardly tell he was a Soling. But at least five times he was in the right corner. I thought at the time that he had merely been fortunate to have had the five races in which he went the right way count. Now I recognise that his victory was not merely good fortune but good sense. Sailing as he did would not have guaranteed a win, but sailing conservatively would have guaranteed a loss.

Heavy air running and broaching

by STU WALKER

Problem

Maintain speed and utilize waves despite risk of sudden increases in yawing moment to windward or to leeward, occasioned by heeling and/or rocking, asymmetric immersion of the bow and/or pitching, abrupt change in course (yawing), displacement of the centre of effort of the sails, or oscillation of the spinnaker.

Solution

Keep boat and sails flat and stabilised. Avoid abrupt alterations in yawing moment when altering course (to respond to waves, when jibing, etc.). Keep sails trimmed at all times, to provide a modest windward yawing moment and to avoid inducing vertical or horizontal oscillation.

Responses (Theoretical)

Keep the boat upright, particularly when the bow enters the back of a wave or when the course is altered deliberately.

Alter course (for jibing for instance) only when the boat is surfing and the bow is not immersed in a wave. Distribute the crew so that the boat is level both fore and aft and athwartships.

Prevent rocking. Do not allow the upper portion of the mainsail to become so full or be so oriented that it generates lift perpendicular to the long axis of the hull. Do not allow the spinnaker to become so full that it generates lift perpendicular to the long axis of the hull and oscillates.

Keep the main and the spinnaker trimmed flat so as to maintain a modest windward yawing moment (and to prevent rocking).

Responses (Practical)

Keep the mast raked aft. Ease backstay, Cunningham, vang, etc., sufficiently to prevent compressive bending.

Keep the outhaul tensioned so as to decrease mainsail draft.

Trim vang/mainsheet so that mainsail is flat with little twist, leech is flat, and boom is approximately 45° off centre line. A special knot should prevent the boom from going out too far (permitting it to be released "By the Run" as the weather mark is rounded). The major cause of broaching while running is allowing the mainsail to be too far outboard thereby generating athwartship lift.

Keep boat upright and bow level (or up). Keep crew weight equally distributed athwartships and ready to move fore and aft in order to keep bow approximately level — bow down when riding up the back of a wave, bow up when surfing down the front.

Set pole sufficiently for aft that spinnaker is flattened across the jibstay and cannot oscillate. Set pole lower than usual to further reduce oscillations if they occur.

Lead the spinnaker sheet and guy to the deck (or (gunwhale) amidships (through the use of twings, hooks, or snatch blocks) to diminish oscillations.

Trim spinnaker sheet so that luff barely lifts and trim hard whenever it does.

Surfing

Decrease resistance

Keep the boat approximately upright and approximately level throughout.

Use slight variation in hull trim rather than rudder action to steer.

HEAVY AIR RUNNING AND BROACHING — continued

It's rough off Pusan! 1987

Keep boat on wave face

Head up to accelerate through wave back.

Bear away as soon as boat's chest emerges onto wave face and ride directly down wave face. If waves are short (and therefore slower than boat) ride across face to avoid running into back of wave head sooner than necessary. If waves are long (and therefore fast) maintain whatever course on the wave face that through the combination of aero dynamic force and slope drag provides the greatest speed and the longest tenure on the wave face.

Facilitate surfing by diminishing resistance abruptly

Hike hard to jolt boat upright as boat starts down wave.

Jerk rudder to weather to break hull free of attached flow.

Pump sails

Pump (no more than three pumps per wave are allowed) spinnaker. (The spinnaker is by far the more powerful sail and therefore the one which if present should be pumped.) Pump guy back and trim sheet simultaneously as boat is hiked hard and borne away down the wave.

Pump mainsail *if* the helmsman can do so readily without comprising his steering, or if a crew member can co-ordinate the pump precisely with the steering and with the pumping of the spinnaker. In spinnaker-rigged boats, steering and spinnaker pumping are so much more important that less than optimal mainsail pumping often does more harm than good.

Avoid broaching

In very heavy air beware abrupt course changes, pumps associates with excessive easing of the shifts (before or after), abrupt shifts in crew weight (particularly to windward), courses angled across the wave face which may be associated with heeling and asymmetric immersion of the bow, and running into the back of the wave ahead while heeled.

Prevention of broaching while jibing

Broaching is due to yawing imbalance — either an excess moment turning the boat to windward ot to leeward. Prevention depends upon keeping the boat in balance — preventing alterations in hull immersion, rig attitude, or sail shape — during the jibe. In really heavy air, it is sensible to wait until the "right" moment - a cockpit-filling broach will lose far more than an extra 50 yards on the initial jibe.

(1) Tension the twings so that near the shrouds the sheets are at boom height.

(2) Square the spinnaker -- preferably to previously tested marks on the sheets so that the tack and clew are equally far aft (the tack pulled back 18-24 inches from its usual running position) and the foot of the spinnaker almost touching the jibstay. Cleat both sheet and guy.

(3) Send the foredeck man up on deck as the bow breaks through a wave crest. Have him wait for an order before jibing the pole.

(4) When the boat begins to surf down the wave front, have the deck man jibe the pole and simultaneously, the middle man throws the boom across.

(5) As soon as the boom has crossed the centre line, counteract the turn (bear away on the new jibe) and have the middle man grab the sheet and sheet in hard.

(6) Re-attach the pole to the new guy (if not already accomplished) and to the mast. Ease the guy forward as the pole is pushed out.

HEAVY AIR RUNNING AND BROACHING — continued

Do not hesitate — once you start, keep going. Have the middle man brace himself for a real effort in getting the boom across and throw it. Bear away as far as necessary to bring the boom across and then counteract the turn.

In a real gale remember it is far easier to recover from a broach to windward than to leeward. Set the boom up so that there will be a residual windward yawing moment — trim the mainsheet before the jibe (the mainsheet knot should be further from the end so that it is impossible for the sheet to run out too far). The old guy should be brought back "too" far when in doubt and the new sheet "over" sheeted at the completion of the jibe to insure that the spinnaker does not oscillate and that it contributes to the residual weather yawing moment.

Recovering from a broach

Recognise whether the boat can be brought back on course easily, with difficulty, or (almost) not at all. Broaches to windward are usually controllable; broaches to leeward ("Death Rolls") rarely.

Easily (to windward)

Bear away — if no response:

Release spinnaker sheet

Wave bearing away excessively and broaching to leeward
Sheet spinnaker back in before boat has borne away completely (to prevent broach to leeward).

With difficulty (to windward)

Release spinnaker sheet — no response:

Boat rounds up beyond wind abeam

Release vang and mainsheet

Continue to head up with spinnaker ragging, until boat comes upright.

Bear away, trim vang, and then after boat is back on course, upright, and moving, trim spinnaker sheet (but before boat has borne away completely).

Not at all (to windward)

Boat refuses to bear away, remains blown over, cockpit fills, despite releasing vang, mainsheet, and spinnaker sheet — no response.

Never release the guy

Trim spinnaker sheet

Release spinnaker halyard and continue to trim spinnaker sheet.

Gather in spinnaker to leeward as boat rounds up further and comes upright.

Bail — or bear away and bail automatically.

Not at all (to leeward)

Boat wipes away to leeward, mast comes over to windward as boom points skyward, spinnaker pole goes under water, water pours into cockpit from windward side.

Recovery will be abrupt and disastrous:

Do not release sheet, (or guy, of course). Usually sheet is trimmed (though not sufficiently) as broach occurs. Sheet in harder, if possible.

Release halyard. If boat is still heeled to windward, spinnaker should fall into water to windward and/or be recovered easily as the boat abruptly comes upright.

If boat comes upright before spinnaker halyard can be released, sheet in hard (if not already done) and release halyard. Drag spinnaker down through rigging.

Never release halyard until sheet (and guy) are trimmed in. Otherwise spinnaker may fill far to leeward and hold boat over.

Bail — or bear away and bail automatically.

Get it together . . . together

by MARK BETHWAITE

REPRINTED FROM *MODERN BOATING*

I have stressed the need for confidence in speed which requires the attainment of speed, best achieved by two boat tuning. The ability to reproduce that speed under regatta conditions is crucial to success.

The other side of the confidence coin is boat handling ability. As is the case with boat speed, it is essential for a crew to be able to handle their boat at least as well as any other team against whom they are competing. The importance of team work cannot be overstated.

The best helmsman in the world will not be able to steer well unless he is backed up by good crew work. Conversely, the best crew in the world cannot perform well if they are let down by their helmsman. Nowhere is the importance of good team work more critical than in tight racing conditions, where boat handling is at a premium.

As with boat speed, the need is to be able to manoeuvre at the start, to tack, gybe and to set and drop spinnakers as well as, or better than, anyone else competing. And as with speed, competitiors who profess to be keen to win regattas consistently show the same boat handling weaknesses.

It is apparent that competitors showing those weaknesses either have not acknowledged their existence or have not worked to eliminate them.

Crews with boat handling weaknesses put themselves at an obvious disadvantage to competitors with superior boat handling. If your ability to engage in pre-start manoeuvres is of a lower order than a competitor's, you

GET IT TOGETHER . . . TOGETHER — continued

are vulnerable to attack by that competitor (match racing at the start is not confined to the America's Cup). If you are weaker at tacking or gybing than a competitor, he will endeavour to take you on in a tacking or gybing duel. Similarly, the ability to handle spinnakers neatly is vital to the outcome of races and regattas — the ability to hang on to a spinnaker longer than others when tight reaching or in a buoy rounding situation.

The confidence I have in my crew's ability to outperform other crews in those situations has won us many races.

Again, as with speed, there must be no "chinks in the armour". But there is no magic answer to the attainment of boat handling ability. The best way to achieve those skills is by short circuit training.

Buoys are laid in an Olympic triangle configuration at much closer spacing than the normal Olympic course. In light weather, the windward leg should be approximately 200 metres, increasing to about 400 metres in a strong breeze. In shallow water, such as Port Phillip or the Swan River, it is easy to lay your own course: four-litre plastic bottles painted bright orange, on anchor line of synthetic cord tied to a brick, will suffice. On Sydney Harbour, our normal practice is to select three permanent buoys to form the desired triangle.

Having set the circuit, you proceed to train by sailing around this course, preferably in competition with other boats. Even if other boats are not available, the close spacing of the buoys simulates the pressure of close racing under regatta conditions and, under this pressure, faults in crew work become immediately apparent.

As with development of boat speed, there is no substitute for hours on the water and this type of training is, in my view, the best possible preparation (better than gym work, jogging or other fitness exercises) for a major regatta. Not only is fitness acquired but the right muscles are exercised and the body (especially the hands) is toughened.

Besides faults in crew work becoming self-evident, faults in systems on the boat also become obvious. From sailing by invitation in a number of boats over recent years, it is my conviction that unless a boat is easy to sail it cannot be sailed well under regatta conditions; unless a system is easy to operate, or a sail easy to retrim when gear changing is required, it will not be done as often or as effectively as it should.

Short circuit training is the best possible way to identify faults in boat layout and operation. Improvement in crew work and boat systems should be complementary and occur progressively as the level of training intensifies.

It is essential to develop crew work over the full range of conditions. Retention of speed by minimising and smoothing crew movements in light air is as important as survival ability in heavy air.

While it is not sensible to use your best sails when training in heavy conditions, the confidence in the performance of the crew and strength of the boat and gear gained from heavy air training can be critical to the outcome of a regatta. Three specific examples come to mind.

Prior to the 1976 FD Olympic trials, Tim Alexander and I sailed in all conditions every weekend and after work every day for two months. We won the trials through our ability to stay afloat at one mark of one race where all our principal competitors capsized.

Before the 1982 J24 World Championship, some of our training took place under extreme weather conditions (one day we sailed in a westerly which was unroofing houses). The confidence and crew work we developed allowed us to win the heavy weather race in the World's by five minutes.

Lastly, prior to the recent Australian Soling Championship, we trained one day in very strong southerly frontal conditions. Although that cost us a bent mast, it ensured that when similar conditions occurred in the championship, both boat and crew were up to the task allowing us to win by a large margin when our competitors were broaching and breaking gear.

Boat speed

by ROBBIE HAINES

Reprinted from *Soling News* A.I.S.A.W.A.

When should I pinch or foot in different sea conditions?

In a Soling it doesn't hurt to have the windward telltale lifting. We always have it moving in most conditions. In rough water it's not a good idea, but both telltales should almost never be flowing back. The boat needs to be stuck into the wind. In a breeze, feathering is the most efficient way to reduce power. By feathering I mean pointing to a point where the boat loses power, thus keeping it flatter, which is fast.

Should I heel a Soling or should I keep it flat all the time?

In over 6-8 knots keep it flat in all conditions. Sometimes I have found it better to heel in choppy water but not very much. It is also faster to keep your crew mini-hiked rather than sitting on the deck.

What is the correct position of the pole?

The general rule is to keep the clews even.

Downwind, should the middle crew play the guy and sheet?

Absolutely, if he is strong enough. Sometimes it isn't needed, but in California the ocean swell usually makes it vital in the lighter wind ranges. If one properly does this one will definitely be faster. In strong winds we usually pump the chute to get on waves. A Soling is heavy, and to do this properly takes a lot of muscle.

BOAT SPEED — continued

Hyeres 1988

In close reaching conditions, should the crew be mini-hiked or leaning out?

If both crews or crew can mini-hike, this is faster. It is faster to get the weight low.

Where should our weight be downwind, reaching?

When sailing downwind, try and move all crew members and yourself forward. This seems faster, allowing the transom to get out of the water. When reaching in light winds, keep your crew in the normal upwind position. When reaching in a breeze, move everyone aft. The middleman should be at the skipper's position and the skipper should be on the after deck. This gets the bow up and out of the water, which is fast.

When sailing upwind, do you adjust your traveller or backstay, or both?

In puffy conditions, the backstay is trimmed or eased frequently. We feel this is important but the main and traveller are more important. Mainsheet tension is first, always look at it in puffy conditions. If it gets light, ease the backstay an inch or so. When you get used to it, it can be done with only a quick glance. In windy conditions, the traveller is your power source. The boat has to be sailed flat, and to do this your hands should be on the tiller and traveller all the time, constantly adjusting to puffs and lulls.

When tacking in hiking conditions who eases the jib?

The forward man always releases the jib in a tack and slowly brings it in when speed is attained. I feel the best rig is the Abbott with the cinter control. This is much more simple than the "fine" adjustment.

Is the fine adjustment necessary?

I haven't really sailed a boat with the fine adjustment. My feeling is that when the sheet needs to be eased, tacking or before excessive waves, the sheet needs to be adjusted very quickly. With the fine adjustment, the purchase is so powerful the sheet goes out very slowly.

In top-level competition, practice seems to play a very important part. Why?

A well-trained team is very important. Many races are won and lost because of mistakes. Our team is very good; but we go out sailing once a week and set up a very short course and go through the sets, jibes and drops. It does get boring but we feel it's essential in gaining an Olympic berth.

What does your middle man do upwind?

We have a unique system on our boat. Eddie is very knowledgeable on sail shape and has complete control of it during the race. Occasionally I will disagree, but 99% of the time he sets the main. He also adjusts the mainsheet, vang, cunningham. This works out well because I can concentrate on steering.

Would you briefly explain Rod and Eddie's jobs on spinnaker sets?

Approaching the weather mark, Rod, who is forward, takes the pole from the boom and hooks it on either upper or lower ring. The top lifts and foreguy are already attached, so this process is very quick. Eddie is still hiking and when we are about one boatlength, he comes in and throws out the chute. Rod hoists. I pull the guy back. Eddie trims the spinnaker until Rod gets the halyard coiled. Of course, while all this is happening the jib has been eased, car released, cunningham off, mast un-bent slightly. Then dropping, Rod takes the pole off and stores it on the boom, Eddie gathers spinnaker to windward, but between the lower shroud, shrouds and mast. Eddie gathers it in his pouch and hikes, unclipping the pouch as he goes out. Rod turns 180° and lies on his stomach to keep weight outboard, he then hooks up the runner, tightens loose sheets and clears up the bottom of the boat. This all takes about 30 seconds!

The spinnaker takedown

by JOE HOEKSEMA

Since the spinnaker in heavy air has always been a tough problem for the average club racer, we would like to suggest an easy solution – take it down. However, getting the spinnaker down quickly and efficiently at the leeward mark in heavy air requires a stuffed bag of tricks and we would like to detail the techniques we have employed.

The leeward takedown

We used the leeward takedown almost exclusively when we first got into the Soling class, but soon found it inadequate. It is carried out by having one crew go to leeward (not the place to be in heavy air) and grab the spinnaker sheet. On a reach, where the spinnaker sheet is riding above the boom, this requires the use of those, as Sam Merrick calls them, "diabolical lines called tweakers". The helmsman then bears off to collapse the spinnaker in the backwind of the mainsail, often giving up that inside berth at the leeward mark. The crew then releases the guy and takes down the chute behind the main.

The windward takedown

A technique which solves the above problems and gets the spinnaker leads in position for the next set is the weather takedown. First, the pole is removed from the mast and guy and stored. In most conditions one can continue to trim the chute by pulling down on the guy to keep the spinnaker tack from riding up the forestay. The sheet is then released and the foot is pulled to weather around the forestay. When the foot is controlled the halyard is released and the spinnaker is dropped.

The halyard takedown

There are times when a leeward takedown is advantageous such as a tight reach when the next set will be the same gybe, or when a spinnaker must be changed. The crew simply lets the halyard run (it must run free) and then collects the sail from the foot once the boat is upright. This is a good technique for retrieving the chute when the boat is knocked down with a severe broach or in very heavy air because the sail gets down and out of the wind before the guy is released.

You've seen these techniques detailed already in issues of the *Leading Edge,* and we naively assumed this was all there was to know about spinnaker takedowns. But, after considerable discussion with fellow sailors we realised there was more to be learned.

The hull takedown

Terry (a.k.a. Mad Dog) Bowman, with crew Dave Schmidt and Bob Foley perfected this technique in the 1978 Wilmette Race Weekend. While sailing at the front of the fleet and approaching the last leeward mark they demonstrated the manoeuvre flawlessly. The hull takedown is achieved by prematurely releasing the halyard while the boat is sailing dead downwind. The crew must then ignore the halyard and continue to trim the sheet and guy so that the spinnaker falls in the water directly ahead of the boat. (It is also advantageous for the skipper to be looking aft at this point so as not to alter course to windward or leeward of the spinnaker as it hits the water.) The beauty of this takedown is that the boat does the rest as the spinnaker entangles on the keel. This is an excellent technique for slowing the boat when you've established a late inside overlap after the two boatlength circle.

The shredder takedown

This takedown can be carried out either to weather or to leeward. After controlling the sheet and guy, the spinnaker

THE SPINNAKER TAKEDOWN — continued

is dragged down across the sheer edges of the spreader tearing large ventilating holes in the Dacron. This allows the spinnaker to "breathe", and prevents the chute from inadvertently refilling which would spoil the perfect takedown. One way of consistently achieving a good shredder takedown is to takedown to leeward aft of the shrouds while the mainsheet is fully eased. The mainsail will then pin the spinnaker between itself and the shrouds and spreader. To fully appreciate the beauty of a shredder takedown a brand new chute must be used.

The leave it up takedown

This manoeuvre was well demonstrated last season in our local fleet by Phil Dowd (although he used his jib instead of the spinnaker the technique is essentially the same). After completing a heavy weather race the jib halyard would not release. Phil quickly solved the problem by releasing the jib sheet and tack, unhanking the jib from the forestay, and sailing into the mooring with the jib flying from the halyard. When the spinnaker is used for the leave it up takedown it makes a colourful mast-head wind vane for the next beat (although some members of our fleet report that it reacts sluggishly to minor, light air wind shifts).

The hack-down takedown

The writers of this article first attempted the hack-down takedown on US25 during the 1978 McNulty Cup in Milwaukee. It was blowing a steady 55 knots out of the west. (The race committee anemometer recorded only 30 knots, but we knew better.) After four hair-raising legs we felt the wind had eased to slightly below 50 knots and so the skipper called for a chute. "Bang" — up it went! "Bang" — we immediately broached, the cockpit filled. It was obviously time for the hack-down takedown. On command the crew released the guy and halyard which immediately paid out to the knots at the end of the lines. We marveled at how well the chute stayed full, flying 45 feet from the boat with no one trimming the sheet. All that remained was to hack through the spinnaker guy with a sharp boat-swain's knife to retrieve the chute from the stern. We now carry large wire cutters to expedite cutting through our new Kevlar spinnaker sheets.

The *big boat* takedown

On a *big boat* (you know — *Sorc, Mac, Admiral's Cup, Off Shore)* when the spinnaker has to be doused the skipper looks to port of the Loran, just aft of the Speedo, behind the AWI, and next to the Digital Computer Course Read Out. There lies a switch labeled "Spinnaker Takedown".

Heavy weather reaching

from August 1977 Leading Edge

I'm amazed how long it took me to discover three techniques that are essential to managing a Soling on a heavy weather reach. I suppose that my training in 14's, in which there was (almost) always enough hiking power and excellent balance did me in.

It took me the longest time to accept Buddy Melges's dictum that the mainsail should be ignored on the reach. For years I tried to get more power out of it (by straightening the mast, easing the outhaul) and complained to my crew that they weren't hiking hard enough! It is now clear that the boat cannot be made to bear off down a wave, that wave riding, which requires immediate responsiveness to the tiller, minimal heeling, and no rudder drag, is impossible in a Soling with a full main (excessive weather yawing moment). Simple solution (as Buddy said): leave the backstay and the outhaul alone as you round the weather mark! (I can de-rake the mast with the jibstay and then re-bend it with the backstay, which theoretically should be better, but I don't bother.) In fact the less you have to do as you start the reach the better; once the spinnaker is up the only things that matter are steering, hiking, and trimming the vang and the spinnaker (to match the course and the apparent wind variations integral to wave riding).

Playing the vang. I didn't recognise the importance of this until the '72 trials in San Francisco Bay. The vang, if used to windward, should be eased as the weather mark is rounded and then played continuously by the middle man. It must be rigged (I lead its tail [with 18:1 power] from the Barney post through a swivel cam) so that it can be easily trimmed from the position of the middle man when fully hiked. Tightening the main leech provides the power to get you surging down the wave, easing it prevents the heeling and weather yawing moment that would otherwise develop as the bow digs into the back of the wave ahead.

I've been taking the spinnaker down to windward for a long time (to obviate the use of those damned twing lines and to keep the crew to weather) but I've only just learned that you can keep the chute full after you remove the pole at the end of the reach. If the middle man holds the guy *down* (to the deck, if possible), it will not ride up the jibstay, the pole can be removed early, the sail will remain full, and the dousing operation becomes a leisurely event.

Sailing the run

attributed to MAURICE RATTRAY

The basic configuration for sailing the run consists of: the crew weight being forward, one on each side in the forward seating position; the mast pulled forward to plumb or even somewhat further; the spinnaker sheets led through twingers to keep them down under the main boom and allow easy in and out adjustment of the main; the main boom all the way out to the shrouds unless reaching sufficiently to require it being in to prevent luffing; the vang tension adjusted to keep the upper mailsail perpendicular to the boat; and, the guy adjusted to keep the pole perpendicular to the apparent wind. The helmsman will normally be to weather so that he maintains the heel of the boat to keep it sailing on course with no rudder needed. Sometimes, in light winds, he will need to adjust his position to leeward to keep the helm centred.

The pole height varies with the wind strength, the wave action, and the reaching angle to the apparent wind. Given sufficient wind, the pole should be flown at its maximum height defined so as to give the maximum projected area to the wind (outer end at 7 feet above the deck or 1 foot above the maximum ring height). With a decrease in wind or an increase in the seas it may be necessary to either drop the pole or sail at more of a reaching angle or do both. The pole should always be flown at the maximum height that gives the leading edge of the spinnaker a uniform curve between the clew and the head. When this edge droops it is time to lower the pole or else head higher to increase the apparent wind. The actual optimum angle to sail down wind depends on many factors. In strong winds one heads straight downwind. It often pays to sail a scalloping course downwind, sailing higher to pick up speed and then bearing off a little as the apparent wind goes forward. This is particularly effective if the sailing higher coincides with the lulls and the bearing off can follow the puffs to leeward.

Pumping to ride the waves can be effective downwind as well as reaching. The idea is the same but the technique is changed somewhat because of the different angle of the sails to the boat. The main is pumped by the forward leeward crew by sharply pulling the boom back by the vang wire, either one long pump or up to three short ones depending on the size of the waves. The spinnaker flier pumps both the sheet and guy simultaneously by throwing his body out and down to provide the necessary force. The spinnaker comes straight back instead of rotating when this is done correctly.

Also in less wind, the spinnaker flier can continuously trim the spinnaker by rotating the whole sail with simultaneous opposite movements of the sheet and guy. Quick movements are particularly effective in light and disturbed air. Under these conditions it helps to lower the pole some in order to help keep the spinnaker drawing when making a gybe.

Our new Soling reflects many years of developing its technology and quality. The results display an abnormally high standard of perfection and love for detail. The new double bottom lay-out gives it an optimal bailing function and the fore and aft compartments are really watertight with spinnaker sheet tubes leading to the cockpit. MADER-SOLING – the best boat for the best sailors.

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FLEET PROMOTION

Building stronger, more active, fleets

by LARRY BOOTH

The Milwaukee Yacht Club Soling Fleet with 15 boats is not the largest fleet in the country, but it is certainly the most active. During 1979 they averaged 11 boats per race — the third year in a row attendance has topped 70%. A remarkable average considering the fleet's fairly heavy club racing schedule of 59 races over a six-month sailing season.

How do they do it? Larry Booth MYC Fleet captain attributes their success to five things.

(1) Crew recruitment activities;

(2) A two-division scoring system;

(3) Special crew awards;

(4) Special pre-race sailing seminars; and

(5) An informal fleet newsletter.

(1) Crew turnover is a problem in any racing class and the only way to solve it is through a programme of active crew recruitment. At Milwaukee, getting crew for individual skippers is a fleet activity. Members are alerted to be on the look out for potential crew. If a member does meet or hear of someone, the name is passed on to the fleet captain who then calls the person and gives him a pep talk on Soling sailing. If they show interest, the fleet captain tries to arrange a crew position. If none are available, the crew's name and vital statistics (height, weight, etc.) are put on a crew list which is given out to fleet members for future reference.

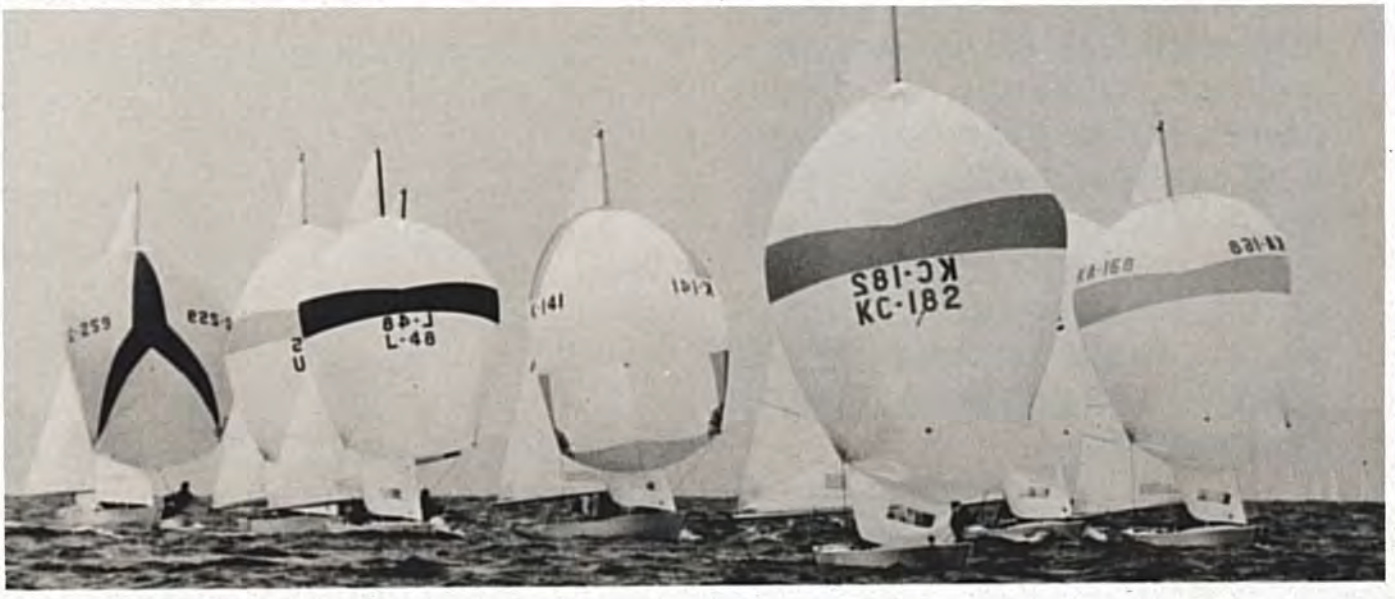
(2) The two-division scoring system probably needs no explanation. It is a must in a moderate size fleet if you want to sustain the enthusiasm and participation of those in the second half of the fleet. And it's good for front-runners, too, because everyone sails harder, which makes for better competition all round.

(3) When it comes to passing out awards at years end the crew at MYC are held in the same esteem as the skipper. The crew members of each winning "team" get the same award as the skipper — a handsome 2" diameter Olympic-style medal hung on a red, white and blue neck ribbon. The medals, which the fleet had cast especially for them, are made in heavy metal alloys simulating gold, silver and bronze. The total cost of the three medals, by the way, is less than one of the typical store-bought skipper trophies, but their worth in motivating and retaining crew and fostering team spirit is far in excess of their price.

(4) To build members ability, the MYC Fleet conducts what has come to be known as Saturday Morning Seminars. A couple of hours prior to the fleet's Saturday afternoon races, fleet members gather on the dock beside a tied up Soling. Jack VanDyke and Charlie Kamps take turns leading discussions on any number of subjects, using the tied up Soling as their training aid.

(5) To keep the fleet informed on a timely basis and to present news and information they wouldn't otherwise get through the yacht club's newsletter or the *Leading Edge,* an informal fleet newsletter is sent out periodically. These occur mostly during the winter when the fleet is not in regular contact with each other. Probably it is no one particular programme which is most effective but rather the combined effect of all the efforts that has enabled and sustained member activity. It should be obvious, however, that no amount of ideas or innovative programmes will help an ailing fleet if there is no one to organise and follow through on them.

Building an active fleet is not so much a matter of having great ideas as it is having good people who are willing to give of their time and effort to see that those ideas are carried out.



SAFETY

Safety measures

by DAVE PERRY

Here are few thoughts that would make sailing and racing Solings safer.

Hiking harness

If the harness includes an *open-faced hook* to attach the hiking-aid line to, the entire harness should have a *quick-release capability,* so that the entire harness can be quickly and easily removed from the body. If one of the straps that comes from around the back was attached to the centre plate containing the hook, with a spring-loaded, quick release shackle such as the one used on the spinnaker halyards (the advantage of these type of shackles, is that once they are opened they stay open, and must be manually closed. Also, with a line attached, they can be easily opened under load.); then when released the entire harness could be quickly peeled off over the head.

Many crews have found that simply looping the hiking-aid line over the open-faced hook is unsatisfactory, as it falls off too easily in tacks and other manoeuvers. Consequently, many have modified their system to attach this line more permanently to the harness. If (a) the harness is easily and quickly removeable, *and* (b) the hiking-aid line is easily and quickly detachable from the floor, I see little potential danger in this arrangement.

Further, in this case the *open-faced hook can be eliminated completely from the harness,* and a simple closed metal ring can be used in its place. The hiking-aid line would be attached to this ring, either with another spring-loaded quick-release shackle, or with a simple bowline, if (a) and (b) above are both the case. The shackle attaching the strap from around the back would also snap easily into this ring.*

Hobbles (anklets for hiking)

The hobbles must be designed so (a) they stay on the ankles comfortably when moving about the boat and hiking; and (b) they are quickly and easily removeable in a matter of seconds, including when under load. Again, the hobbles that Tucker designed were a big step in a good direction. The part of the hobble that came over the ankle was wide and well padded. The strap continued around under the ankle and back up inside the strap which was over the ankle. The underside of the wide padded part of the strap, and the part of the strap that came back around underneath it were attached to each other by wide, strong Velcro. With this system the hobbles are readily adjustable to the size of the sailor's boot and ankles, and with a quick separation of the Velcro straps, the entire hobble comes right off.

The reason I feel that the harness and hobbles should be designed so they can be removed from the body entirely and easily, is that even if you unattach yourself from the floor, you are still "wearing" a shackle that can attach itself to something else; your legs are still tied together with a line that can impede your swimming, and can catch on something on the boat; and if your harness has one, you are still wearing an open-faced hook on your chest.

* Ed.'s Note: Since March 1987, a new class rule, 13.31 – Hiking Gear – has been in effect.

On "Shen", my hiking system hooked into a fixed pad-eye ring in the centre of the boat (I was the middle crew). The shackle I used was a larger version of the same quick-release shackle used on the spinnaker halyard. I had a 5" piece of 4" line as a pull-string, and I made it a different colour than any other line we used in that area on the boat . . . so I could always find it in a mess.

Tucker attached to a bar with a Carbiner hook, which essentially is a spring-loaded snap shackle that opens and then snaps shut on its own. This type of hook runs very smoothly on the bar, and is fast to hook back up after a jibe or take-down. But, if you were swimming near a sinking boat with your hobbles, *et al.,* still on, this type of hook could attach itself to a shroud, etc. Also this type of hook is near impossible to release under load.

Buckets

We never discovered a good system to store our buckets so they were easily accessible if we needed them, but so they stayed out-of-the-way and didn't roll around the rest of the time. Perhaps someone in the class has; or at least if the group were together they should be able to figure out a good system. Maybe hanging them somehow up in front of the mast column, or under the stern deck lip, is a way to go. This might encourage more people at every level of racing the boat to carry three adequate buckets.

(Editor's Note: The three buckets can all be tied together with a single line through their handles and then attached under the foredeck by an easily-released bowline.)

Halyard tails

Storing the tails is always a problem. Perhaps a piece of shockcord around the mast column could be used to store the coiled halyard tails under. Most of us loosely coil up the tails and sort of toss them up forward.

The problem arises when there's 3" of water sloshing around up there, wrapping the tails around themselves and everything else. Also a knife in the "barney post", or somewhere easily stored and accessible can be useful in many situations. Also, what's the best way to store the spinnaker halyard tail, so that in a moment's notice, the chute can be dropped with confidence that the tail will run free. Jim Coggan's crew put their's in a bucket; we used to throw ours overboard.

(Editor's Note: The main and jib halyards should be coiled, tied off in a secure manner, and then secured under shockcord near the mast base. Release of downhauls, Cunninghams, etc., should reduce the tension in the halyards sufficiently so that they are easy to release. If the boat fills up, the best solution may be to drop the sails and bail.)

Bailers

One medium-sized bailer per side doesn't seem to be enough. Do two per side, with at least one being a *large* one (perhaps even a Super-Suck) do the trick? If so perhaps this should be strongly recommended or written into the

SAFETY MEASURES – continued

class rules, and made mandatory for all Solings ever built. (I'm thinking of the older boats which may only have the one set in now.)

Control line catch-all bags

Soling owner's should be encouraged (required) to install a large bag attached beneath all their controls to catch the tails of the control lines as they are passed back through the deck for clean-up. We finally did this in "Shen" for the Trials, and it made a huge difference! The tails don't clog up the bailers, and don t get under foot on the cockpit floor. Perhaps a few Soling sailmakers could be encouraged to manufacture these.

(Editor's Note: A hammock of dacron [5'6" x 20 ' (forward), 16" (aft) suspended under each side deck [from the bulkhead in the way of the mast aft to the site of the helmsman's control lines] will [1] catch all the control line tails, [2] prevent the lines crossing above the spinnaker lines from being trapped in the stowed spinnaker, and [3] provide an accessible place to stow the second jib)

Storing extra sails

Carrying extra sails is a standard hassle in the Soling. I suspect more than one Soling sailor has raced with their forward or stern bulkhead hatch cover off, and the sails stuffed up in there. What are some of the systems people have developed to carry their extra mains and jibs? It couldn't hurt to put a bit of emphasis on the consequences of a sudden broach with a hatch cover off.

(Editor's Note: As only the jib is needed during a race, the second main can be stored in the stern tank with the cover secured.)

Life jackets

Where do people store their life jackets when not in use? Not so good places are at the bottom of the starboard spinnaker bag, especially when filled with foul weather gear, sail bags, and extra spinnakers, etc.; and loose up front of the mast column, where they can float around or away in a sudden brooch. Better places might be on top of the mess in the starboard spinnaker bag, or in a specially installed bag under the stern deck lip.

I realise that putting the responsibility for hoisting a life-jacket flag in the hands of a race committee opens the door to some sensitive liability issues. But in fact, no sailors should need direction as to when to wear their jackets. If the jackets are comfortable and safe, they should be worn most of the time, as part of normal dressing for racing!

(Editor's Note: Life jackets should be accessible but not loose so that they can float away or become entangled in rigging. They can be stored under the stern or forward deck and held up by shock cords led through the deck stringers.)

"No spinnakers"

Do standard Soling sailing instructions have a provision for "No spinnakers"? In a boat with propensity for rolling and submarining like a Soling, a spinnaker is often the major cause for calamity. To avoid putting race committees in awkward and difficult positions, a fleet assembled should discuss openly during their skippers' meeting or at some other forum, when such a flag might be flown. This would be affected by the sailing conditions, the number and quality of the boats assembled, the number and quality of the rescue boats on the course, and the importance of the regatta.

Knock-down technique

One boat in Argentina got knocked over on a close reach with their spinnaker up. Before they could take on too much water, the crew quickly released their spinnaker halyard. The boat immediately popped back up and just as quickly the crew hoisted the chute again. Through this, the guy was left cleated, and the sheet was let run free. It seemed like a good technique as long as the chute didn't get caught in the water . . . and worth passing on.

(Editor's Note: The important issue is *never release the guy* [until or unless the sheet is well in hand] so that the sail can flag, not fill, from one corner or the other.)

Make safety a must – not an option

by SAM MERRICK

Let's agree – safety just isn't an interesting subject, so that those of us who write about it are destined to be ignored much of the time. Nevertheless, here goes for an effort at the beginning of a new sailing season when all of us can do some things that will avoid anguish (or worse) before the 1987 season rolls around.

Boats take time – money too of course, but time seems more difficult to appropriate to the list of things that keeps on accumulating. Right off that's where safety comes in second to replacing frayed halyards, removing bent shackles, riveting loose fittings, getting correct sizes of cotter pins, retie-ing tired shock cord. *(On a Soling the soundness of keeping water out of the flotation areas should come first.)*

A few years back we had a race for which the forecasters predicted 8-12 knots. We put on our light air sails. By the end of the first beat it was 20; by the middle of the second reach we doused the spinnaker in 30 knot gusts. Before again getting to the windward mark, wind was blowing off the tops of the waves at better than 45. We got back to the lee shore harbour just as rain reduced visibility to zero. Boats still on the course had to survive the wildest of conditions or their crews stood a good chance of being lost at sea. Such weather surprises are not uncommon. In 1978 at Kiel Week three Solings (water tight doors off!) sank when squalls filled them to deck level. The skippers were all World class types, so if it happened to them, it can certainly happen to the rest of us. Such incidents should be a warning to those who sail older boats to take special care when weather turns bad.

How about life jackets? Some are comfortable but not good enough to keep you afloat even in a bathing suit. Be sure the ones in your boat will perform when it's cold enough to sail with sweaters and boots. "Coast Guard Approved" on life jackets is not a gimmick to protect U.S. manufacturers. Jackets constructed of air cells are comfortable and effective when new. Because these cells fracture after long use, they lose their designed capabilities – hence they are not CG approved.

Our class rules have been adopted to prevent the boats from sinking. Re-read Rules 12.11 through 12.222 and you will recognise how much attention has been given to assuring that compartments in bow and stern, and under the cockpit sole, will be as watertight as possible. The size and placement of holes for control lines are rigidly proscribed, and so are the means to be taken to insure watertight bulkhead covers. If those covers have been allowed to warp, or the gaskets deteriorate with age, renew the deficiencies as soon as possible. Their soundness is all that stands between floating and sinking after an unscheduled jibe in 25 knots.

Lifting slings is another area of concern. A Soling even without all its gear plus water, can weigh enough to kill someone if that person should be under the boat when the sling fails. Make a thorough inspection of the elements involved at regular intervals: the nuts on the keel bolts are probably solid enough, but the bracket holes may be too sharp for the wire unprotected by a thimble. The thimble on my current boat kept dropping out, so I replaced the whole apparatus, starting with two substantial stainless shackles for the brackets. In use, keep an eye on the wire to be certain that it is not being fractured over time.

Trailing boats on a highway has produced another set of legends – like the driver who noticed that the boat was no longer in his rear view mirror. (Of course, the car's occupants soon solved the problem of the boat's whereabouts as it came abreast, and rolled to a smooth stop.) Safety chains, the soundness of the entire hitch system, the ball bolt, the various welds or bolts tied onto the vehicle's frame. Every detail must run a test for possible failure. And while you drive, just keep in mind how much room you need to stop, not only to avoid collision, but prevent the boat from jack-knifing or wrenching loose from its trailer.

Then, finally, think of the crew. Open hooks on the hiking proved fatal to one among us when the boat sank and drowned him as he slid up the shroud but no further than the point where the shroud entered the mast. Rule 13.31 says hiking gear must be able to disengage under pressure. Does yours?* If someone falls overboard from your boat, retrieval action is automatic. But when the someone is from another boat, get your thinking in gear for helping and away from racing. Man overboard drills should be a mandatory component to every spring practice session. Try it with the spinnaker up and the skipper letting go of the helm.

In addition to the buckets, anchor and anchor line, and paddle, a couple of well placed knives, one foreward and one aft, should be standard racing equipment.

One last word

When stepping the mast, ALWAYS check overhead for electrical wires, especially at away regattas. Regatta organisers, in an effort to find room to accommodate the travelling sailors, often select a site that is not free from this hazard. Even the best regatta organisers are not exempt from making this mistake. Following the 1984 U.S. Olympic Trials, Solings and Stars were hastily pushed into the street to make room in the lot for boats being pulled and came within inches of overhead wires before the danger was realised. Safety First is not just a cliche. It is a must.

*** Ed.'s Note: See new class rule 13.31, brought in March 1987.**

Sam Merrick

Flotation test

by MAURICE RATTRAY

On 25 August, 1979, after the practice race at Cork, Bill Abbott performed a flotation test on "Bits n Pieces". The boat was first placed loosely in a sling and pumped full of water with the bailers open. The equilibrium water level was 20 cm above the floorboards and it changed less than 1 cm after ten minutes of standing under these conditions. Next, one person climbed the mast to the spreaders and heeled the boat over so that the gunwale was almost awash. This made no perceptible change to the rate of taking on water, apparently as the control holes were not yet below the water level. Finally the bailers were closed and the boat completely filled with water to put all the control holes completely under water. After 45 minutes in this configuration the boat was still comfortable floating so the experiment was terminated. The water level in the after compartment was approximately at 25 cm while that in the main bilge was at about 10 cm above the bottom.

This experiment clearly demonstrated that with all hatches tightly dogged on good rubber seals, there is only a very slow leakage through the hatches themselves. Furthermore, when all the bulkhead holes are under water the sinking rate was very slow and more than one hour would be required before all flotation was lost. This is considered to be a conservative estimate of the rate of filling which would occur with the boat layed over on its side such that one-half of the holes through the bulkheads and the deck would be underwater. This is certainly ample time in which to clear the boat, get it upright and begin to bail it. Anything more, other than complete watertightness, would not provide any additional safety.

In order to take full advantage of the safety built into a Soling, the following precautions must be taken:

(1) The rubber gaskets on all hatches must be in good condition.

(2) There must be a sufficient number of thoroughly tightened dogs closing the hatches.

(3) There must be nothing stored in the compartments as this would decrease their effective buoyancy.

(4) It is also important that the holes into the flotation compartments be not larger than necessary and in most cases they can be appreciably less than that permitted by the present rules. I find that most of the hole area is used for the large lines; on my boat, a sister to the test boat, the holes for the spinnaker and jib sheets each used 2.4 cm^2 and with the backstay hole this pushed the area through the afterdeck very close to the 5 cm^2 maximum allowed. The other areas I found to be: aft bulkhead, 6.6 cm^2; forward deck, 2.4 cm^2; forward bulkhead, 4.4 cm^2. It is clear that the allowable maximum areas can be reduced except for the after deck where the two spinnaker sheet holes take up most of the presently allowed area.

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