

SOLING • MANUAL



INTERNATIONAL SOLING CLASS

FOREWORD

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

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.

Almost all of the articles first appeared in *Soling Sailing* or *Leading Edge*, the journal of the US Soling Association.

The ISA Committee are most grateful to all the contributors who have allowed their work to be used in this way.

First Edition, August 1988.

Second Edition, April 1992.

Third Edition, May 1995.

CONTENTS

	<i>page</i>		<i>page</i>
Introduction	3	Trimming for Success	18
BASICS		Bertrand on Boat Speed	18
The International Soling Class	4	Soling Trim.....	19
Shroud Tracks	6	REACHING	
Shroud Track Installation	9	Spinnaker Handling	20
SAIL TRIM		RUNNING	
Sail Trim with the V-1 Jib	10	Downwind Considerations	22
Curtis on Heavy Weather	12	The Light Air Spinnaker Trim	24
Melges On	14	CREWING	
STARTING		The Principles of Crewing.....	25
Start Defending your Hole to Leeward	15	PRACTICLE RECOMMENDATIONS	
UPWIND		Masts Breaking	26
The Modern Soling	15	Techniques and Fittings.....	26
Sail Trim.....	16	Tricks	27
Robbie Haines' Wisdom	see boxes on pages 8, 10, 13 and 14		

Editor: Stu Walker

Authors: Ed Baird, Jesper Bank, John Bertrand, Heike Blok, Jim Brady, Dave Curtis, Paul Davis, Robbie Haines, Larry Klein, Buddy Melges, Sam Merrick and Stu Walker.

INTRODUCTION

HOW TO BECOME A SOLING OWNER AND ENJOY IT

by HEIKE BLOK

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 fulfil 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!"

Let's start the circle

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!

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").

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?

At the hoist (or how to avoid a disaster)

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 - with the pole downhaul tensioned and cleated.) 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!).



Heike Blok

BASICS

THE INTERNATIONAL SOLING CLASS

by *STU WALKER*

Jan Linge designed and built the first Soling in 1964. Three years later in the second of two trials, its remarkable range of performance, easily controllable in a gale, responsive in a drifter, resulted in its selection as the IYRU's Three-Man Keelboat. Sixty boats were built in 1967, 300 in 1968, and, with the impetus of Olympic selection, another 1600 in 40 countries between 1968 and 1972. Buddy Melges and Paul Elvstrom, the dominant figures in the early years of the Class, met at Kiel in the '72 Olympic Games and Melges won the Gold Medal.

As the intensity of competition and the standard of performance increased, the large number of local fleets which characterized the Class in the '70's gradually gave way to concentrations in major yachting centres. However, the efforts of the top sailors to support the newcomers maintained a relative homogeneity and the Class became known for its singular success in mixing all levels of competence in its many regattas. With a single mainsail and shrouds mounted on tracks, sailors of all ages - from 16 to 60 - and weights from 70 to 90 Kgs (average all up crew weight 255 Kgs) compete successfully. A new surge of boat construction from three very active builders has resulted from the recent opportunities for sponsorship.

Today in Europe Olympic aspirants participate in a year-round circuit of twenty major regattas and from April to October European Lake sailors travel from country to country competing in regional regattas almost every weekend. In North America and Australia several major regattas each year draw boats from opposite coasts together, but club racing is typical. Solings are also sailed in many Asian countries and in the larger countries of South America. The Olympic Regatta attracts entries from 22 to 25 different nations.

Match racing was introduced to the Class with the donation of the Ken Berkeley Cup in 1979. Since then interest has steadily increased and, with the announcement of the new Olympic match racing format, Soling match racing regattas are being conducted in North and South America, Europe, Asia, and Australia. The majority of the world's ranked match racers are present or former Soling sailors.

The most important advance in the management of the Soling in the past decade (perhaps since its design) has been the attachment of the shrouds to cars mounted on tracks to facilitate use of the fixed spreader rig. This innovation permits the use of but one mainsail in all conditions (without reefing) and facilitates the adaptation of which ever of the two permitted jibs is in use to a wide range of wind velocities and waves. The purpose of the shroud adjustment is to maintain jibstay sag within the range appropriate to the jib without altering mast bend beyond the range appropriate to the mainsail.

In light air this requires "pre-bend" - the induction of jibstay sag and modest mast bend (the amount for which the mainsail was designed) with or without only minimal backstay tension. A light air jib such as the North V-1 needs 3"-4" of jibstay sag to properly distribute the draft while modern mainsails require only 1 1/2"-2" of mast bend. By pushing the upper shroud cars to the forward legal limit the spreader tips and the mast at their level are forced forward, bending the mast about two inches (without backstay tension). The resultant shortening of the mast column eases the jibstay into a 3"-4" sag with minimal wind pressure. In the lower wind ranges variations in mainsheet tension are sufficient to keep

the jibstay from excess sag and from 6-8 knots a little backstay tension can be added without excessively bending the mast. At some increased wind velocity (usually between 3 and 8 knots) the shroud cars must be moved aft (to a position midway between full forward and mid-mast) - sooner in waves, later in smooth water.

In light air to windward jib shape is the most important determinant of success and is achieved primarily by control of jibstay sag, the jib trimmer calling for more or less and the main trimmer responding with more or less mainsheet and backstay tension. When these adjustments are insufficient (without adversely affecting mainsail shape) to control the jibstay sag, the shroud cars are moved aft. The attachment of the sheet to the clewboard and the position of the luff of the jib on the jibstay are based upon the response of the telltales, up and down the luff, responding simultaneously to variations in heading (erring toward the lower telltales reacting first - the bottom of the jib slightly flatter than the top). It is best to use a clew hole in moderate air that permits the tack to be an inch or so above the deck so that sheeting angle adjustments can be made by moving the jib luff down the stay if the wind velocity increases (and up the stay if it decreases) without changing the clew hole. (All modern boats have multi-part controls of tack downhaul and halyard (uphaul) led to each rail for easy adjustment - as well as jib traveller and a fine jibsheet adjustment.)

The jib should always be twisted - more in light air and in waves. The chord of the foot, with the centre of the traveller car set between 11 1/2" and 14" from the centreline, should be 10°-15° inside of the position of the upper batten. A telltale attached to the leech at the latter position should (according to Dave Curtis) "never, never, never stall". A window in the mainsail is usually provided through which this telltale can be observed. "When in doubt, let it out (the jib sheet)". The resistance of the jib leech to stalling is improved by using clew holes farther forward or displacing the sail down the jibstay, i.e., by increasing its twist.

In light to moderate air to windward the mainsail should be set on a mast that sags to leeward (achieved by slack lower shrouds). With only the amount of fore and aft bend (2"?) for which the sail was designed. If the jibstay sags or pumps excessively despite sufficient mainsheet and backstay tension to bend the mast more than 2", the responses should be, first, to bring the shroud cars aft and, second, to increase the lower shroud tension. The concept of the "Kostecki Wobble" is that some (but very little) jibstay pumping is desirable, i.e., trim to just, but no more than just, eliminate it. With the jibstay controlled the mainsheet/traveller couple should be adjusted to bring the boom to the centreline (or in ideal conditions slightly to windward of it) and to keep a telltale on the leech at the upper batten just flowing. This telltale is almost as critical as that on the upper jib leech. Only in optimal moderate air, smooth water conditions when the boat is up to speed should it be completely stalled; when slowed by tacking, dirty air, waves, etc., it must be flowing. The outhaul should usually be trimmed hard to prevent the lower leech from hooking (particularly in light air), and the Cunningham left without tension until the boat is overpowered.

In heavy air to windward the shroud tracks are used primarily to reduce jibstay sag by stiffening the mast. By pulling the upper shroud cars aft the spreader tips are moved aft preventing the midmast from bending forward. At the same

THE INTERNATIONAL SOLING CLASS – continued

time lateral mast sag is eliminated by tensioning the lower shrouds and/or pulling their cars aft. Above 18-20 knots the most important adjustment is the tensioning of the lower shrouds above the tension of the uppers (upper tension 600-800 pounds) and pulling them full aft (to a tension much greater than the uppers). The result is that the top of the mast falls to leeward, eases the upper mainsail leech, and permits the mainsail to be set with its lower portion on the centreline (for pointing) and its upper portion twisted off 20° or more to reduce heeling and improve balance.

In heavy air the jibstay will always sag more than is desired so that all shroud cars should usually be full aft and the backstay tensioned to both flatten the main and control the jibstay. It is possible to move the shroud cars too far aft, however, resulting in a tight jibstay but too full a mainsail and possible to use too much backstay, resulting in too flat a mainsail and, through excessive mast bend, an eased jibstay. The jib tack should be trimmed down to the deck and, if necessary, the sheet attached at a hole farther forward to facilitate twist. If the boat is not driving through the waves, lays over and wallows when a gust hits, the most important adjustment is to ease the jibsheet. The jib top should be more open, the upper telltale even more resistant to stalling. The traveller car should be eased slightly and eased farther in gusts.

The mainsail should be flattened through the tip fall-off discussed above and through fore and aft mast bend of 5"-6" induced by backstay tension. The boom can be carried close to centreline with adjustments for gusts in smooth water made by (slightly) easing the traveller and heading up and in waves by tensioning the backstay. The mainsheet should be close to two-blocked. The usual rake (approximately 29° - measured by the amount that the jibstay length (when under tension to windward) exceeds the hounds to deck mast length) should be decreased if necessary (though usually not) to permit adequate mainsheet tension. The lowers should be tensioned and the sheet eased until the boat seems lively, shoots ahead, rather than wallowing, in gusts. The outhaul should be full out and the Cunningham tensioned only enough for balance - usually some horizontal wrinkles persist even in heavy air. The mainsail may luff in a smooth inward bulge, but should never slat or flog. The vang should be tensioned, if necessary, to flatten the lower portion of the main and stop the mast from pumping. If the mainsail continues to flog, the jibsheet will need to be eased and the jib traveller dropped until the jib leech conforms to the mainsail's leeward bulge and the flogging stops.

The control of jibstay sag/mast bend is influenced by the tension in the shrouds, the angles, both horizontal and vertical, which the shroud tracks make with the mast, by the length (optimal forward movement is limited by Class Rule, aft not significantly affected) of the tracks, by the position of the spreaders in the mast, by the angle of the spreaders to the mast, by the position of the shrouds in the spreader tips. The usual arrangement is to have the tracks parallel to the centreline, at a slope perpendicular to the mast rake, and with the spreaders perpendicular to and in the middle of the mast. However, increased pre-bend, optimal for light air, smooth



Jibe Mark at the '94 World Championship

water sailing, can be achieved by high upper shroud tension, slack lowers, upper shroud tracks with minimal rise forward (or toeing out), and spreaders set (or swept) back in the mast or shrouds set back in the spreader tips. Increased stiffening, optimal for heavy air and waves, can be achieved by moderate upper and high lower shroud tension, upper shroud tracks with increased rise forward and/or toeing in, and spreaders set (or swept) forward in the mast or shrouds set forward in the spreader tips.

Offwind speed is primarily dependent upon good crew work particularly by good spinnaker sheet control. On the reach many (but not all) have the middle man control the sheet and the foredeck man control the guy which comes forward above him. By pumping the guy the foredeck man can aid the initiation of surfing (not more than twice per wave) and prevent broaching (for which purpose unlimited pumping is permitted). The guy should never allow the pole to be less than one foot off the jibstay (which sags to leeward). When the pole is farther forward the spinnaker becomes too full and in strong winds the boat goes slower and makes more leeway. When reaching the pole should (except in very light air) always be fully elevated (to the upper ring or to the upper legal limit) but should not be angled more than 15° above the horizontal as this diminishes the sail's projected area and, in heavy air, shifts the draft aft to increase heeling and windward yawing. (And in very strong winds makes the sail more difficult to manage.) Except in very strong winds - above twenty-five knots - even on tight reaches the large spinnaker can be carried by an experienced crew. (The small spinnaker is now limited to use in very strong winds on tight reaches particularly in crowded conditions and in very light air downwind when it permits the boat to make a net gain by sailing lower). When the first reach becomes too tight standard practice is to set the big spinnaker and ride fast as far down the leg as possible. Then on the mark approach (with sheet and guy tightly trimmed) the spinnaker halyard is eased to permit the sail to float out ahead and to leeward while the boat is brought back on course. The halyard is rehoisted just before the jibe.

Some have the spinnaker halyard led aft for the helmsman to hoist - most at the mast base for the forward crew to hoist immediately after he throws up the spinnaker roll (packed neatly for easy opening). In the latter case the helmsman

THE INTERNATIONAL SOLING CLASS – continued

pulls the guy aft rapidly and the middle man takes the sheet. In strong winds it is essential that as the spinnaker is trimmed, the crew (at least the big one), hop over the rail into a full hike, the vang is released (or in hand for release), and the foredeck man pumps the guy for that first important wave. Thereafter, the boat is hiked sufficiently to keep it "on its feet", the spinnaker man keeps the luff folding (at least a foot) to assure that the spinnaker is facing as far forward as possible, the foredeck man pumps the guy as necessary, and the vang is played to maintain the optimal angle of heel (in, if the crew are dragging, out, if the crew are not!). Keeping the boat bolt upright (with the main ragging completely, if necessary) is essential to proper wave riding - which in strong winds is the determinant of reaching success.

Reach to reach jibing is the most difficult manoeuvre in the Soling - and even the best periodically fail - particularly in a crowd. In light air it is essential to move the spinnaker across the bow of the turning boat at a speed greater than the turn - as the apparent wind shifts rapidly. In heavy air the keys are to keep the spinnaker choked - the old guy trimmed full aft (and in very strong winds, cleated), with the old sheet minimally eased, and for the new guy to be held down by the tight sheet, the middle man's hand, or best, by a tightened twing line - so that the foredeck man can reach it easily (after taking the pole completely off the spinnaker). The foredeck man should attach the pole to the new guy and with his outboard hand slam the pole forward against the tack. This manoeuvre brings the inner end of the pole up into position so that in coordination with the easing of the previously tight (in very heavy air, cleated) guy, it can be easily reattached to the mast. In very heavy air a wide gradual swing, even giving up a couple of boat lengths in order to be outside, with both sheets cleated, the spinnaker choked, the middle man only needing to bring the boom across, and the helmsman only needing to steer, down slowly to the jibing point, briefly back against the swinging of the boom, and then gradually up to the new course, will pay large dividends.

Downwind the boat must be balanced - free of rudder drag. To avoid the usual windward yawing moment this means releasing the backstay and pulling (with the jibstay) the mast 2'-3' forward of vertical, heeling the boat slightly to windward, pushing the bow down by moving crew weight forward (in light to moderate air putting one crew on the foredeck), and

keeping the spinnaker shifted to windward of the centreline (to the extent possible). The spinnaker is the important sail (unless the jib is pulling significantly it is best dropped); the mainsail needs only to have sufficient vanging to remove twist and be displaced so that most of it is approximately perpendicular to the apparent wind. On broad reaches the boom should be brought inboard until the leech telltales begin to flow as any aerodynamic lift is valuable.

The spinnaker should always be set so that the maximum area is exposed to windward of the centreline - out from under the mainsail. The pole should always be carried as far back as possible without flattening the spinnaker foot excessively - without pulling it against the jibstay. It should also be carried as low as possible so that the spinnaker moves to windward with its centre seam vertical. The sheet must always be maximally eased, the luff always breaking - the bigger the break the better as it means more of the sail is to windward and less of it is driving the boat into the wind. In light air the helmsman may take the guy and nurse it back as he bears away in the puffs, ease it forward as he goes up in the lulls. In moderate to strong air it is better to keep the guy fixed (as that transmits the force of the sail directly to the boat) and the course changes can be read as indicators for jibing to the more directly downwind jibe. The top of the spinnaker is creating lift from the overflow and in moderate air, to improve the angle of the sail's upper surface, the halyard may need easing.

The Soling must be tacked downwind at fairly high angles. Up to 15° to the dead downwind course there is no significant increase in distance sailed so it is rarely desirable to sail closer than 15° to that course (always up in the lulls, down in the gusts). In light air it is essential to keep the spinnaker pulling, to sail (with the pole down sufficiently) as high as is necessary to keep it so, to avoid the luff sagging into a J-shape. In very light air the little (mini) spinnaker may be useful downwind. Its small area permits it to lift at a lower sailing angle than the big sail and, if the sailing angle required to keep the big one full is more than 30° to the dead downwind direction resulting in a large increase in distance sailed, the mini will provide net gains. On reaches even in the lightest air the big sail will usually function - but if the mark cannot be laid without a jibe consider the mini.

SHROUD TRACKS

by **STU WALKER**

The use of shroud track cars permits jibstay tension to be (at least partially) divorced from backstay tension and mast bend. With them forward (pre-bend) in light air, it is possible to bend the mast (so as to accommodate the mainsail luff curve) without tensioning the jibstay (so as to accommodate the jib luff curve and keep the jib full). With them aft in heavy air, it is possible to tighten the jibstay without excessively tensioning the backstay and bending the mast. In order to maximise this independence, to obtain more pre-bend and jibstay sag in light air and more mast stiffness and jibstay tension in heavy air, we must recognise the following influences:

1. Backstay Tension - with no backstay tension, forward movement of the shroud cars merely rakes the mast forward. With shroud cars abreast the middle of the mast, one must determine - and mark the backstay - at the tension needed to bring the mast back to its intended rake without bending the mast - i.e., while sighting up the mast, pull on the backstay until (and stop pulling when) the mast just begins to bend.

This tension becomes the zero mark on the backstay. Moving the shroud cars all the way forward (without changing the backstay) shows how much pre-bend is attainable (at least 5 cm - depth of cord - should be possible).

2. Upper Shroud Tension — if the uppers are loose, no pre-bend (or mast stiffening) results from movement of the shroud cars. The converse is also true: if upper shroud tension is high, pre-bend and mast stiffening are attainable—the higher the tension, the more effect a given amount of shroud car movement produces. If the upper shrouds are at a tension of 800-900 pounds (400 kilos), pre-bend (with the cars in the forward position) and mast stiffness (with the cars in the aft position) will be maximised.

3. Rake - the effect of rake is relative to the vertical "ramp angle" of the shroud car track, but for any given "ramp angle", more aft rake will increase the effect of shroud car movement forward and decrease the effect of shroud car movement aft - and visa versa.

SHROUD TRACKS – continued

4. Mast Stiffness - the more the inherent stiffness of the mast, the less pre-bend will be achieved by moving the shroud cars forward and the greater the jibstay tension which will result from moving them aft - and vice versa. The relative stiffness of the upper and lower sections of the mast is also important; a stiff upper section will facilitate lower mast bend and vice versa.

5. Lower Shroud Tension - as the lower shrouds are short, lower shroud tension contributes but minimally to fore and aft mast bend or stiffness. As lateral mast bend is directly modified by lower shroud tension, lower shroud tension should be utilised primarily for this purpose. When lower shroud tension is 50% or more of upper shroud tension—because the longer uppers stretch more than the lowers, the mast tip will fall off to leeward, the middle of the mast will be pulled to windward, the jibstay will remain tight, and the upper mainsail leech will open (an appropriate configuration for heavy air). When lower shroud tension is less than 50% of upper shroud tension, the middle of the mast will sag to leeward, the mast tip will be pulled to windward, the jibstay will sag additionally, and the mainsail will become fuller (an appropriate configuration for moderate air).

6. Spreader Position - as the primary purpose of shroud cars is to create, through the upper shrouds, a forward or aft pressure on the spreader tips (thereby pushing the middle of the mast into prebend or pulling it aft so as to stiffen the lower mast), the position of the spreaders relative to the mast is very important. Most people believe that they should be fixed in the lateral mid line of the mast so that upper shroud tension can push them forward as efficiently as aft. If the spreaders

are cocked forward (if the attachment of the upper shrouds is forward of the midline of the mast), the mast will be more readily stiffened by shroud car movement aft and less readily bent by shroud car movement forward—and vice versa.

7. Shroud Car “Ramp Angles” - if the shroud car tracks are mounted on ramps which are parallel to the centreline and at a vertical “Ramp Angle” which is perpendicular to the raked mast, shroud car movement will be maximally efficient in both directions. This can and should be checked with the mast in the fully raked (for windward sailing) position by determining where the shroud cars rest when not restricted. If the vertical “Ramp Angle” is reduced (low forward) and/or the tracks “toe out” forward (horizontally), the resting (null) position for the shroud cars will be aft of the midline of the mast and the configuration will readily induce pre-bend with the shroud cars forward but provide little mast stiffening with the shroud cars aft—and vice versa.

8. Lower Shroud Car Position - maximum mid-mast sag and the fullest possible mainsail are sought in moderate air at wind speeds which just begin to require full hiking. To achieve this effect, the lower shroud cars should be in the null position - the lowers maximally eased - in these conditions. In lesser winds one would like for there to be but a slight increase in lower shroud tension (to diminish mast sag and flatten the main) while facilitating pre-bend. This is achieved by pushing separate lower shroud cars forward of the null position or by having “sloppy” (4”-6” of lateral play) lowers attached to the upper shroud cars. As soon as the wind increases above that which can be compensated for by full hiking, separate lower

THE CENTER OF SOLING ACTION

**ABBOTT
BOATS**

BOATS, MASTS, PARTS, SERVICE
 ABBOTT BOAT INC., 1458 London Road, Sarnia, Ontario, Canada N7S 1P7
 Telephone: 519 542 2771 Fax: 519 542 2324

SHROUD TRACKS – continued

shroud cars should be moved aft of the null position (so as to stiffen the lower mast, diminish mid-mast sag, and tighten the jibstay). Lower shrouds mounted on the same car as the uppers must be tensioned directly. In increasing winds (above 12 knots) the lowers should be tensioned more rapidly than the uppers. As the uppers are moved aft to the null position, their tension (and the tension of accompanying lowers) is reduced; they may not need to be moved father aft (except in chop) until the wind is above 16-18 knots. But in such winds, the lowers

car null position is aft of the mast midline), increased rake, and spreader tips aft. A longer track (if necessary) to bring the shroud cars farther aft in heavy air should be sufficient to counteract these influences. The extremes to which pre-bend is facilitated or negated depends upon the conditions in which the boat is usually sailed. If one never ventures off the light air Swiss lakes, every effort should be made to increase pre-bend; if one always sails in a gale in the Indian ocean off Fremantle, every effort should be made to increase mast stiffness.



should be under much increased tension which means (1) separate cars and tracks for uppers and lowers, and (2) increasing tension in the lower by use of the turnbuckles.

9. Upper Shroud Car Position - the forward shroud car position is limited by the rule which establishes a maximum forward position for the intersection of the upper shroud with the deck. Inasmuch as there is no aft limitation, it seems reasonable to maximise the effect of forward movement (so as to gain optimal pre-bend) and to allow a long track aft to overcome this adjustment (so as to gain optimal mast stiffness). One should assure that the tracks permit the upper shrouds to be brought as far forward as is legal (not to waste a millimetre), but, in addition, should use track ramps at a reduced angle (low forward) or "toed out" (so that the shroud

10. Sails - one presumes that all jibs benefit by induced jibstay sag in light to moderate air and that all mainsails benefit from having some minimal mast bend to match their designed luff curves - but, obviously, some need more than others and the extent to which one pushes to attain additional pre-bend depends upon the degree to which the sails are benefited. One also presumes that all jibs are benefited by attempts to reduce jibstay sag in heavy air (when it so readily becomes excessive) and that mains should not be overly flattened by excessive mast bend, but, equally obviously, some need more control than others and more or less mast stiffening. Enhanced pre-bend permits a heavy air jib and a tight-leeched main to be used effectively in light air, while increased mast stiffness may permit a light air jib and a loose-leeched main to be carried up into the higher wind ranges.

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.

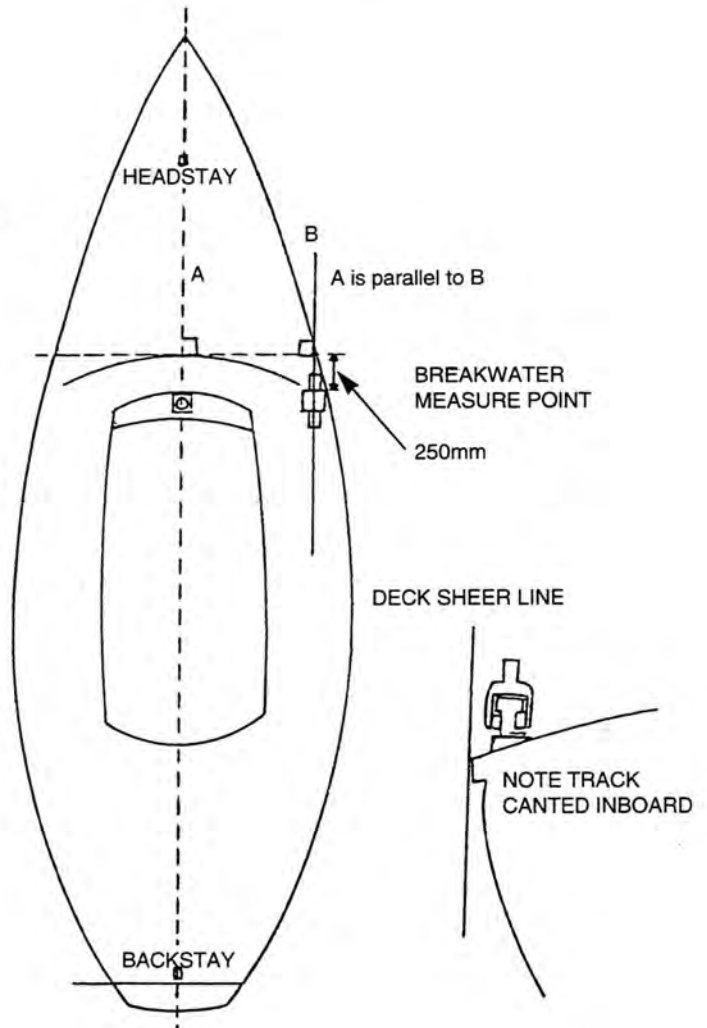
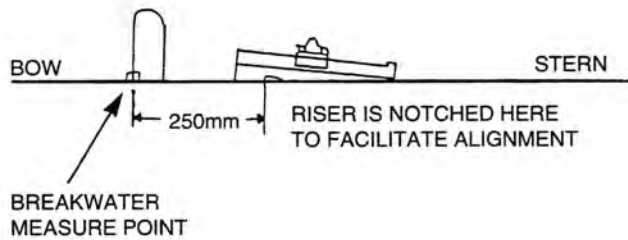
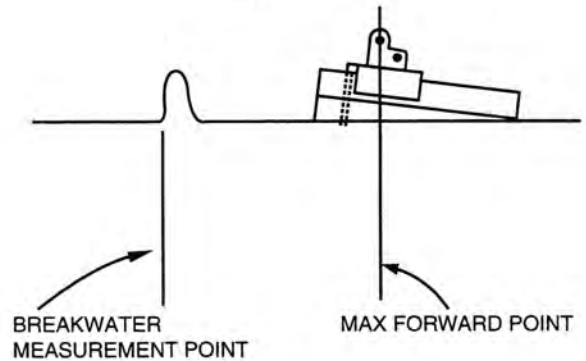
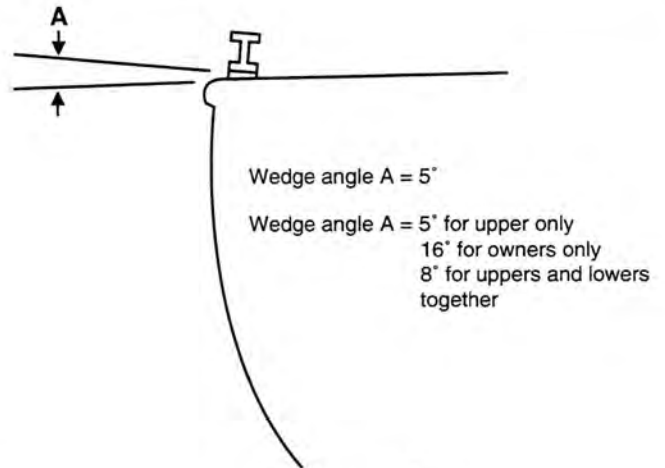
In close reaching conditions should the crew be mini-hiked or leaning out?

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.

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 $1\frac{1}{4}$ inches in from edge of deck sheerline. Drill $\frac{1}{4}$ inch hole for forward bolt and insert.
- (4) Locate after bolt so that tracks are at the desired angle 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.



SAIL TRIM

SAIL TRIM WITH THE V-1 JIB

by **DAVE CURTIS**

Characteristics	Fullness Vertical Draft Location - Twist Horizontal Draft Location Leech Position - Openness
Controls - Fullness - Jibstay Sag - Shroud Car Position	Mainsheet Tension Backstay Tension Crew Hole and Luff Position Jib Lead Angle - Vert. and Horiz. Sheet Tension
Vertical Draft Location	Clew Hole and Luff Position Sheet Tension
Horizontal Draft Location	Jibstay Sag Luff Tension
Openness - Clew Hole and Luff Position	Sheet Tension

Standard Settings - Traveller - Set car (wire) 11"
(from centreline on splash rail)
Clew Hole (from back corner) #2 or #3
(new jib #2 - old #3)
Luff position (tack from deck) 3"
(with luff showing wrinkles)
(all adjustments at tack)
Vertical distribution of draft should
be (as sail was designed) fuller
at the bottom but not excessively

2. Adjustment (to retain same shape) - Jibstay Sag
Mainsheet - until 6 knots mainsheet alone controls jibstay
0-3 knots - no tension
3-6 knots - great increase in tension
Backstay - 0-6 knots - enough tension to produce 1 1/2-2"
of mast bend
6-8+ knots - add backstay tension to keep jibstay sag
at 3-4"

When Dave was asked to look over the above outline of factors determining jib shape, he said that I was making it much too complicated, that he didn't think about draft position and fullness, never went down to leeward to look at his jib! He felt that (inasmuch as sailmakers had designed the jib to work in a pre-determined environment) all the sailor had to do was **to adjust properly all of the factors that affected jib shape and the correct jib shape would logically follow!** (*I put an exclamation mark there because this was a surprise to me.*)

1. Intent - The intent of V-1 (and other) jib trim is to retain the designed shape. The trimmer should do his best - despite alterations in aerodynamic force, jibstay sag, jibstay movement, etc., etc. - to keep the sail - in all wind strengths and all conditions - the same (with minimal variations). The horizontal draft position should be about 40% aft of the luff - but Curtis never looks to check it. The designed luff curve of a V-1 jib is about 1 1/2-2 inches and it should be set on a forestay that only sags about 3-4 inches. **That 3-4 inches must be induced in light air and must be minimized (prevented from increasing) in heavy air - and control of jibstay sag is the most important factor determining proper trim (but it should be attained through proper mast control.**

Upper shroud cars

0-6 knots - #1 position
6-10 knots - #2 position (one sitting on deck)
10-14 knots - #3 position (one hiking)
14-20 knots - #4 position
20+ knots - #5 position

Tack position - Gradually tension - full down at 14 knots to keep draft forward and open top

Jibsheet tension Gradually increase tension but under 8-10 knots never stall upper leech tell-tales

3. Mainsail (**If properly adjusted jibstay sag will be appropriate**)

Mainsheet tension- err on keeping too tight with too little backstay

0-3 knots - raise boom to reduce leech tension
3-6 knots - increase mainsheet tension with leech tell-tales flowing
6-14 knots - tension (once up to speed) sufficiently to stall tell-tales while main is kept full and jibstay tight by shifting shroud cars aft #1-#2-#3

Backstay - **primary control for variations in velocity**

err on being overpowered - tension backstay only when overpowered avoid being underpowered - ease backstay, then mainsheet
14-20 knots - shrouds cars aft #4

backstay progressively tighter mainsheet to keep leech firm tell-tales just flowing

"Minimal backstay" - find tension that with shroud cars #1 begins to add additional mast bend - and add a little more - should always have tension

DC-1 main (leech tighter) requires more backstay tension than ES-11.

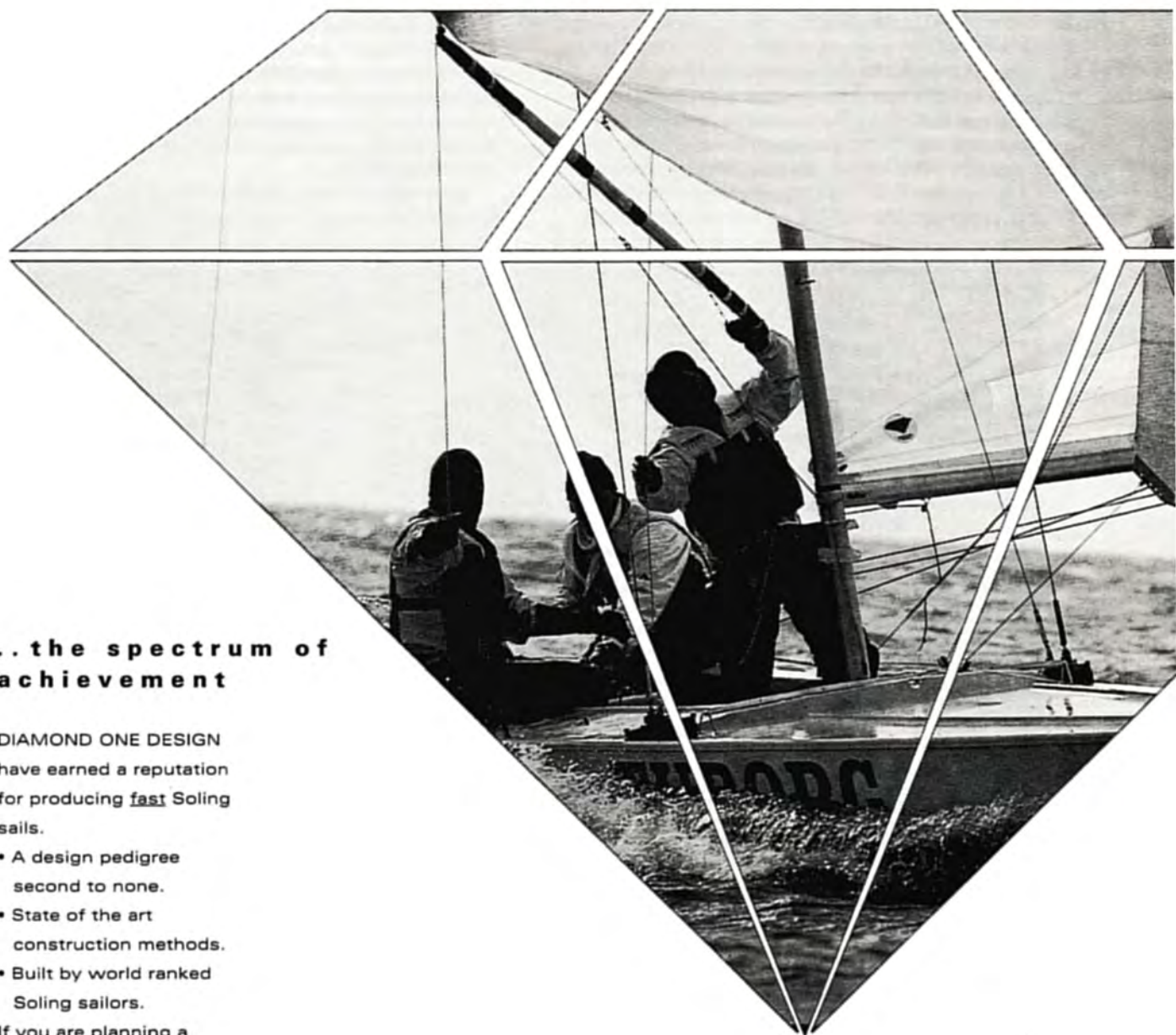
Would you briefly explain Rod and Eddie's jobs on spinnaker sets?

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 unbent 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!

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.

Facets of Success...



.. the spectrum of achievement

DIAMOND ONE DESIGN have earned a reputation for producing *fast* Soling sails.

- A design pedigree second to none.
- State of the art construction methods.
- Built by world ranked Soling sailors.

If you are planning a serious campaign this year call...

DIAMOND ONE DESIGN and make the most of this outstanding opportunity to give your boat the winning edge over the competition.

DIAMOND ONE DESIGN
SUNDKROGSKAJ 8
DK-2100
COPENHAGEN
DENMARK
TEL: 45 31 204090
FAX: 45 31 204412



CURTIS ON HEAVY WEATHER

Excerpts from an interview published in "SAIL MAGAZINE"

Setting up the boat

Curtis demarcates 15 knots of wind as the point above which you have to concern yourself with controlling the rig, especially the forestay tension and the mainsail shape. The trick is to increase the former while maintaining the latter.

Pulling the upper shroud aft on the track puts tension on the spreader tips and inhibits bending at the spreaders. The lower shroud tracks are sloped downward and aft more than the uppers. As the shrouds are pulled aft, they get tighter, acting like running backstays and keeping the mast straight.

"Moving all the shrouds back," says Curtis, "really stiffens

previous advice. "It gets to be a real hunt-and-peck to find the right combination of vang, backstay, mainsheet, and shroud tension so everything is balanced for the wind and chop," Curtis admits.

Aside from the forestay, the only other significant heavy-air adjustment that Curtis bothers with is the jib car. In puffs, he has the crew let the jib out on its athwartship track to open up the slot between main and jib and reduce the backwind effort of the forward sail.

On a long running leg in heavy air, Curtis says, it pays to let the mast return to vertical to get the chute out in front of



the lower part of the mast and allows you to pull all that much harder on the backstay to control the forestay. When it's blowing, you tighten the backstay until the mainsail won't allow any more bend and starts to turn inside out. From that point you add heaping doses of main-sheet tension and lots of cunningham to get a solid rig and a pretty flat mainsail. We're trying to get the forestay to give as little as possible, but we're lucky if we can get the sag down to six inches."

In winds over 22 knots, Curtis also tightens the vang, which bends the mast down low and flattens the mainsail a bit more. More important, it moves the mainsail's centre of effort forward an inch or so, which reduces weather helm. "Out there today [during the practice race] in 22 knots, I had less helm than if it were blowing five or ten knots," he said.

For San Francisco Bay's notorious short chop, Curtis likes to keep some twist in the mainsail leech. As the bow rises on a wave, the apparent wind slows, especially at the head of the sail, only to speed up as the bow drops down the back of the wave. Keeping the leech twisted assures that some part of it will always be in correct alignment with the wind.

You get twist by pulling the traveller to the centreline, pulling on the backstay to bend the tip of the mast, and letting the upper leech fall away as much as 18 inches. You also ease the mainsheet a bit, which seems to contradict Curtis's

the boat. In order to do so, you have to return the shroud cars to their forward position, at least on one side. Curtis prefers to release the portside cars, because if everybody forgets to reposition them during the takedown, it's easy to pull them back after you round up to the new beat on port track.

It also pays to manually tighten the turnbuckles of the lower shrouds when you're racing a breeze. If you can get them tighter than the uppers, they'll pull the middle of the mast to weather and let the upper portion of the mast fall off to leeward, thereby depowering the rig even more.

Sailing on Olympic course

On the weather leg, timing your tacks to occur in smooth water should be a priority, unless tactics or an emergency forces you to do otherwise. "It's really slow to get slammed by a wave in the middle of a tack and be stopped," says Curtis.

Soling crews wear ankle hobbles - straps around each ankle that are hooked onto a ring in the boat. The hobbles take the place of hiking straps but make it hard to shift weight around much on a beat, especially when the two crew members are slung over the side. In a blow these two crew should let off their body harnesses until their backs are parallel to the deck and as close as possible to the water. The skipper can't mini-hike as the crew does. Instead, he should

CURTIS ON HEAVY WEATHER – continued

droop-hike over the rail with his head up to see the waves and wind. The crew should still be able to see and call the compass headings and direct the skipper in close tacking manoeuvres, since they're at water level and can see under the boom to leeward.

Curtis normally sails with a crew weight of about 570 pounds, with his two crew weighing about 200 pounds each. With Billingham, Curtis had about 630 pounds on the rail, which is rare but effective in heavy air. Ideally, the middle man should be the heaviest and the skipper the smallest.

The initial set

Unlike most other Soling sailors, Curtis stores his spinnaker pole on deck for the first beat. He figures he saves a couple of seconds over those who store it on the boom and have to pull it forward and attach the guy. Instead, forward man Brad Dellenbaugh clips the guy into the outboard end and anchors the inboard end on the outer-most starboard jib traveller support. The pole is held in place by tightening the sheets. The topping lift is attached to the pole and led outside of the jib track to keep it clear of the jib.

Good Soling sailors wait until they're about ten seconds from the mark to raise the pole and prepare to hoist. In heavy air you want to keep your weight out as long as possible. The mechanics of hoisting are the same as in lighter air, but special emphasis needs to be put on pulling the guy forward and getting the halyard up as soon as the rolled chute is thrown out of the cockpit.

"If the sheets twist and the chute fills, you're cooked," warns Curtis, "because the wrap is in the sheets, not the sail. I have the guy in my hand, and the second I see the spinnaker leave the crew's hand, I pull it to the pole and around the headstay. The forward crew is hauling as fast as he can on the halyard at the same time."

On heavy-air reaches, you have to release the leeward twing all the way so the sheet can clear the outer end of the boom at the hoist and ride up the leech of the mainsail. If it doesn't, you've got to pull in the boom by hand and flip the sheet over. This frees up the spinnaker leech, reducing heeling pressure. It also allows you to release the boom if you start to broach.

Soling class rules permit pumping the guy as much as needed to prevent broaching if such conditions exist. The forward crew reaches up and yanks on the guy, which brings the pole rapidly down and aft, opening the leech, and freeing the pressure on the rudder.

The key to going fast on a heavy-air reach is trimming the chute correctly. You have to let the sheet out as the boat rises up to the front of a wave and the apparent wind moves aft. As soon as you accelerate, trim the sheet back in. "If you're not strong enough to let that two feet of sheet out and trim it back in," says middleman Bob Billingham, "you just can't sail a competitive reach. You've got to always be on the edge."

Curtis and his crew move aft on a power reach and hike straight legged (to keep their bodies out of the water). The forward crew grabs the guy for support, and the middle crew has the spinnaker sheet. The skipper pumps the main. Curtis likes to have the vang control line at his fingertips rather than leaving the vang to the forward crew and distracting him from playing the guy. He also eases the backstay a few inches, releasing the mast but keeping the forestay fairly tight, which helps the jib hold its shape.

Managing the gybe

Ideally, you want to catch a wave going into the gybe at the reaching mark. This will reduce the pressure on the rig. Often, however, tactics deem otherwise. Use your leeward twing line to pull the spinnaker sheet down so the forward crew can

grab it after the boom comes across and hook the pole to it. The easiest place to mess up during the gybe is when the boom is halfway across the boat and a puff hits.

During the practice race before the North Americans, Curtis lost his footing during a gybe. He ended up with his feet hobbled together and up under the deck, where he couldn't get any traction. The boat rolled violently to weather, much to the amusement of his competitors. "There's a fine line between being in control and being totally out of it," he said afterward with a chuckle.

At the leeward mark, the chute is almost always dropped to weather. By doing so, you can pack it in the port spinnaker bin and be ready for the set at the next weather mark. Only if you're approaching fast on a tight reach would you drop to leeward. So his crew doesn't waste time in the boat setting up the pole on deck, Curtis stores the pole on the boom for the remaining weather legs.

The cardinal rule for coming out of the leeward mark is not to tack onto starboard for at least 100 yards. On a spinnaker reach, Solings kick up a huge bow wave. "Even if you tack around the mark and you're above the boats coming in," warns Curtis, "you're going through the horrendous backwash. You've got to find a smooth-water lane as well as a good wind on the second beat."

Running

Setting up for the running leg in heavy air requires a few more adjustments. The mast has to let forward, which means releasing tension on the shrouds by moving the shroud cars forward on at least one side. You also want your twing lines set to keep the leeward sheet under the boom, which allows the spinnaker to shift out to weather and gain more exposure. Heeling to weather is fast, but again there's a razor's edge between fast and crashing to weather. Don't heel the boat more than 15 to 20 degrees. With a heel more than that the boat will be harder to steer and the bow will want to round down.

Watch your crew-weight placement fore and aft, too. In general, Curtis says, you should stay forward in the cockpit on a run to get the stern out of the water and decrease drag. This is less important in heavy weather, however, than keeping the bow from nosing into the waves. As you start down a wave, the crew should stay forward to help angle the boat down that wave. If the bow starts to poke into the next wave and the helmsman can't wriggle the boat free by heading up or down, shift your crew weight aft or you will have solid water coming into the cockpit. Needless to say, this not only affects your concentration but it's also very slow.

Gaining the edge

While medium-air racing tends to maximize tactics, light and heavy-air conditions tend to emphasize speed, not only in a straight line, but at the corners as well. Achieving that speed depends on setting the boat up correctly and executing manoeuvres with authority. "I put a priority on boathandling in heavy air," says Curtis. "Once you have that confidence, you can concentrate on tactics and windshifts."

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?

MELGES ON . . .

report on a seminar conducted by BUDDY MELGES

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 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. 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 minimises 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.

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.

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.

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.

STARTING

START DEFENDING YOUR HOLE TO LEEWARD

by **JIM BRADY**

First published in "American Sailor"

How many times have you worked or tacked into a great open space on a crowded start line only to see another boat sweep in at the last moment to take it for himself? I'm sure it has happened to us all more times than we care to remember! Once you have positioned yourself with a nice boat-free zone (hole) to leeward, there are several techniques that can be used to defend against attacking boats. You are saving this hole, of course, to accelerate into just prior to the start for maximum speed at the gun, and to keep clear of bad air from boats on your leeward bow.

The two common threats against your hold are boats making a late port tack approach and yachts on starboard reaching down the line from your windward side. Let's address the port tacker first. When an approaching yacht is seen coming at you from your leeward port side on port tack, your best defence is to bear away quickly, aiming just above the other boat. This must be done far enough in advance so as not to foul the port boat by altering course, preventing him from staying clear. When bearing off, try to keep your boat slow by overtrimming the mainsail; this way, you will not use up the hole or your windward position in your defence. The bear-away is meant to encourage the attacker to continue on past you or to force him to tack much sooner than planned. If the attacker does duck you and continues on, use the speed you have generated from your short bear-away to gain valuable weather distance and get back up under any boats

on your starboard side; this enlarges your hole again to leeward. If you did not effectively discourage your attacker from your hole and he decides to tack to leeward of you, keep your bow down until he tacks past "head to wind". Then head up sharply, trimming in your main and try to widen the gap between you.

To best defend yourself against boats from your weather (starboard) side who may try to duck into your hole, bearing off is again the best manoeuvre. This time, however, you may need to gain speed sooner to prevent the attacker from gaining an overlap to leeward of you, thus winning the battle for the hole. Often, an extreme bearing-off to open a small hole to windward of you will be enough to discourage any further attack. (This technique can be very dangerous if you are sailing in boats which are not very responsive as far as turning and accelerating.) If you are successful in defending your hole, make sure you do not slide too far forward, as this will give the windward boat another chance at ducking your stern. It is imperative to keep up close to and overlapped with the pack of boats on your windward side.

Having a hole to leeward will help assure a good start by giving you room to accelerate and keeping your air clear to leeward. If you have done an effective job of staying up close to the boats on your weather side, the chances are slim that a fast competitor will be able to foot over you and odds are that you will be slowing down the pack to weather, enabling you to tack and cross the pack on the next shift.

UPWIND

THE MODERN SOLING

by **JESPER BANK**

Reprinted from Seahorse

Since 1990, the Soling class has had a two-tier race format consisting of fleet races like the other classes and match racing, particular to the Soling class. This meant that teams campaigning for the 1992 Olympic Games had to attack it on two fronts. On one side, sailing to maintain or improve their level in fleet racing, as only the top six boats from the fleet races qualified for the match race. And on the other side, improving or learning match race skills, something which was completely new to most Soling sailors.

Some of the more ambitious teams made every effort to enter the grand prix match race circuit, a difficult circle to break. Sailors are only invited to sail if they hold a top ranking position and if you are not invited to sail you cannot score points to improve your ranking.

Leading up to the 1992 games, those Soling sailors who had managed to race on the grand prix circuit benefited greatly from the experience, obtaining a crucial edge.

Today, the situation is slightly different. With the sport of match racing increasing in popularity all Soling sailors now have access to numerous good events. The match race level

of the Soling sailors is increasing with much more depth at the top of the class.

Added to this, the Soling class has seen the arrival of many new faces as a result of the Flying Dutchman losing its Olympic status, including Doreste (Spain) and Batzill (Germany), as well as sailors from the Finn class such as Westergaard (Denmark). These three sailors alone hold around ten World, European and Olympic medals between them and combined with the number of previous and defending champions from other classes now competing in the Soling, the level of competition has never been higher.

The level of competition and interest in the class is further enhanced by a number of match race stars announcing their intention to participate in Olympic trials, attracted by the number of major Soling regattas which hold match race finals - like the Olympics.

Entry into the class is relatively simple: suppliers of the best hulls, spars and sails are very few.

HULLS

Two boat builders have dominated the market over the last 10-15 years; the American continent is dominated by Abbott

THE MODERN SOLING – continued

Boats, which supply more than 90% of the boats racing in the US. With the current exchange rate the Canadian Abbots are cheaper to buy than European boats. If you add the transportation cost (in a 40 foot container) the Danish built Borresen Soling is now relatively expensive when exported to the USA.

It is worth noting both boats' performances at major championships sailed in 1992, 1993 and 1994. An Abbott boat won the 1993 World championship, while Borresen boats won three European, two World and one Olympic championships in the same period.

The competitive lifetime of a Soling hull averages four to six years.

SPARS

When it comes to masts the choice is even simpler. All of the top boats use Abbott masts. The only things that vary are spreader lengths, spreader attachments and spreader strength (depending on the supplier). The reason why no-one uses masts from other builders is the near perfect profile designed by Abbott.

What still has to be considered by the sailors is the stiffness of the mast. It has become obvious that stiffness varies from shipment to shipment. Most people look for maximum stiffness and minimum weight.

The need for a stiff mast is huge and is related to the way the Soling is rigged. The only way to put tension on the forestay is by using the backstay and the main sheet. The more backstay you use the greater the bend of the mast and the flatter the main. The stiff mast allows you to put more forestay tension on before you flatten the main and this is the starting point for most sailors and sailmakers. Again the competitive life of a mast averages four–six years.

SAILS

In the late eighties and up to 1991, the Soling sail market was dominated by North Sails, before Elvstrom Sails made a strong challenge, moving to a position where it has won most of the championship titles since 1992. North won the 1992 European championship and shared the 1994 World championship, but in this same period Elvstrom won two European, one World and one Olympic championship. The average lifetime of a jib is half a season, the main a little longer and the spinnaker one-one and a half seasons.

CONCLUSIONS

It is obvious from the above that the choice of boat is limited to two dominant builders, the choice of mast is limited to one builder and the sails market is dominated by two sailmakers. This makes it relatively simple for newcomers to enter the class, choose the right gear and be competitive from the very beginning.

This leads us to the primary characteristic of Soling sailing which, in essence, is tactical sailing. Differences in boat speed are extremely small and you very rarely hear of somebody winning a regatta because of superior boat speed.

At the end of the day the crew work, motivation, the atmosphere on the boat and tactical skills all contribute to winning medals. To obtain all these, I am convinced that a team needs to have worked together for a long period with a highly ambitious spirit and in a friendly environment. To complete the perfect team, a Soling crew should weigh in at approximately 270 kgs.

SAIL TRIM

by **LARRY KLEIN**

From "Leading Edge" - by Steve Bobo

Preparation - Larry first talked about preparing a Soling to race. He feels that the keel is too big relative to the size and shape of the hull and the sail area (compared to a J-24, for example), so it should be made smaller to reduce wetted surface to the extent the class rules permit. In particular, the leading edge radius should be made as narrow as possible and the keel made as thin as possible. He does the same thing for the rudder, thinning it as much as allowed by the rules.

Larry doesn't see any speed difference between shiny and dull hull surfaces. However, he recommends buffing the hull with McGuire's Mirror Glaze, which closes the pores in the gelcoat, particularly when sailing out of a dirty harbour. In his opinion, a new Soling is not significantly faster than an older one.

Larry does think that weight is important. Weigh the boat, and if it is too heavy, put it on a diet. He is particularly conscious of reducing as much weight from the bow and stern as possible. He suggests changing forestay and backstay blocks to lighter ones and replacing pad eyes with lighter ones (or even removing them and sealing the holes). Larry uses only Spectra line in the bow and stern because of its extremely low stretch characteristics and because it is light and does not soak up water. Ideally, all lines on the boat should be either Spectra or Kevlar.

Jib Trim - He trims the jib car in only about as far as the fore-aft portion of the raised splash rail, which is about 14" out from the centreline. Larry frequently changes the height of

the jib off the deck by adjusting both the halyard fine-tune and the tack adjustment. Raising the jib up on the forestay gives it a fuller shape, like moving the sheet to a more forward clew hole. It may be necessary to trim the sheet after lowering the jib towards the deck.

In light and choppy conditions, Larry raises the jib up so that the tack is 3-4" off the deck in order to get more power from a fuller shape. Also, he eases off the backstay to what he terms the "Kostecki wobble" point (where the mast wobbles when the boat hits a wave). Larry puts a telltale on the top batten of the jib and gets it to flow while beating in these conditions. He also eases the jib sheet so that the upper leech shows lots of twist. The top batten should point at the outside tip of the spreader, rather than straight back as it would normally be with more wind or flatter seas. In these conditions, footing is important and much faster than trying to sail too high.

Shroud Tracks - Shroud tracks are used to maintain the balance between mainsail fullness and jib-stay sag. In light air (0-6 knots), don't let the main get too full, because the wind can't make the curve around a full sail and still remain as attached flow. If the main backwinds at the top, then it is too full. The shroud tracks are used to flatten the main while keeping the proper amount of jib stay sag.

In light air, sideways bend of the mast is helpful because it makes the main fuller and the mast tip bends to windward. Larry aims for up to 1 1/2" of bend at the spreaders, which is about half of the mast diameter. With lateral bend, the boat

SAIL TRIM – continued

can point higher and goes slower (but with more power). In light air, 1988 Silver Medallist John Kostecki always kept large wrinkles in the luff of his North FP-6 main. Kostecki got those luff wrinkles by moving both the upper and lower shrouds as far forward as possible on their tracks, and then tightening up the lowers. This pulled the mid-mast forward. With more wind, back off the tension of the lowers, which will allow mid-mast lateral bending. The newer mains, such as the North DC-1, are cut flatter and may not permit these wrinkles.

In light air, keep the shroud cars all the way forward until one crew is over the side, then move the cars one hole back. When both crew are over, bring the cars back to the second hole. When it really blows hard, Larry moves them back to

the fourth hole. His tracks have holes about two inches apart, with a total of five holes on each. Larry always uses 700 pounds of tension on the upper shrouds, although less tension in light air might be appropriate.

Larry suggests using Etchells spreaders because they are lighter and smaller than standard Soling ones. He also plans to experiment with aft-cocked spreaders.

Light Air Trim - Flatter is always faster, even in light air and even if the boat doesn't feel right (no helm feeling). On light air runs, some windward heel can help, but in real light stuff, you will be reaching at much shallower angles than usual, and you may want some leeward heel.

North Soling Sails Faster than ever!



1995 1st Miami OCR

1995 1st S.P.O.R.T.

Eight of the last ten World Champions and seven of the last nine Olympic medalists have used North Sails . . . shouldn't you? Make your move to the top of the fleet today.

Go North!

Number One in One-Design



North Sails One-Design West
1111 Anchorage Lane
San Diego, CA 92106
619-226-1415; FAX 619-224-7018
Vince Brun, Chris Snow

North Sails Marblehead
18 Lincoln Avenue,
Marblehead, MA 01945
617-631-0631; FAX 617-631-7880
Dave Curtis

TRIMMING FOR SUCCESS

by ED BAIRD

Reprinted from Leading Edge.

We were in Ponce, Puerto Rico, preparing for the Soling Worlds.

For a week we sailed alone, until the first of our competitors arrived: Glenn Dexter, Canadian Olympian and former World Champion.

The very first time we went up together, he blew us off so fast he got bored and went off to sail by himself.

Comparing our styles of sailing, there seemed to be one glaring difference in our techniques. We were trimming hard and dumping traveller when the puffs hit. They were keeping the traveller up and easing sheets in the puffs. And, boy were they fast.

Within minutes of trying the new approach, we became a viable tuning partner again. We used our new skill so effectively that we sailed far above ourselves in the event, finishing sixth in our first World Championship. And our friend, Glenn Dexter, won it. The magic was in how we used our sails to help steer the boat. Very simply, we quit thinking of the sails as only a power source, and started using them as a steering tool as well.

We finally realised we were not letting the boat go forward fast enough. By leaving the traveller up, but twisting the sail more by easing the sheet, the boat was free to move forward easily, with a wider steering groove, and less heeling forces. Initially, we sailed slightly lower than before, but because we were keeping the boat flat and allowing the keel to work better, we were not getting pushed around by the waves and puffs, and we ended up pointing higher over the long term.

If we got a flat spot or the wind dropped, we would trim in two or three inches and ask the boat to point. When a puff or a big wave came, we would ease back and let the boat go forward. We soon learned that this system allowed us to

compensate much faster for big changes in the sea or wind, since we were reducing power up high in the sail plan, thus rapidly affecting heel. This made it much easier to steer, as the rudder was not loading up nearly as much, with the boat staying flatter.

Back home we tested with another tuning partner in strong winds and flat seas.

Going back to our old method of trimming harder and using the traveller to depower, we were suddenly faster. As we reflected on the two situations, we realised the difference. In both conditions we were trying to keep the boat on her feet by depowering. But the traveller worked best in smooth water, keeping the sail shape constant while moving the main outboard where it heeled us less. The sheet did more for us in waves, since I was having to steer the boat up, down and around the swells and the twisted shape had less tendency to stall out and/or heel us excessively.

Talking someone into easing the sheet when they are getting tossed around by huge swells and thirty knots of breeze is not too hard. But easing sheets, and I mean the jib as well as the main, when it is blowing six and there is a leftover sea is a lot tougher. But it works.

For the main, put one telltale on the after edge of the top batten pocket. Set the sail up so this telltale flies aft in all but the lightest winds (when it will be hard to get to fly) and you are close to good trim. When the water is smooth and you feel the boatspeed is good, trim a little more and the boat will point. The telltale may be dropping behind the sail occasionally. That is okay, but as soon as you feel the boat slow or feel mushy on the helm, ease that sheet back and get the telltale flying again.

If it is choppy, always, always keep the telltale flying aft. And if the wind is strong with big seas, twist the sail still more, but not so much that the whole top of the sail is luffing.

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.

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. 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.



Jochen Schumann winning the '94 Europeans

BERTRAND ON BOAT SPEED – continued

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

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 telltales 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.

SOLING TRIM

by DAVE CURTIS

Reprinted from *American Sailor*, July 1991.

We need to make sure the boat is set up properly. Mast rake is checked by measuring the amount the forestay length exceeds the mast length. Hold your forestay along the front of the mast and simply mark the forestay at the point where the surface of the deck would be. If the forestay is shorter than the mast, the mark will be on the pennant. We check our rake by measuring the distance from this mark to where the forestay intersects with the deck. The standard rake setting is 28"-30" We use this setting for all conditions.

Our spreaders extend straight out from the mast, with no forward sweep. We have five settings for the fore and aft location of the shrouds at the deck, with a total travel of 1/2". Even though we use separate tracks for the uppers and lowers, the cars move together.

0.3 knots	Full Forward
4-8	Aft 3"
9-12	Aft 6" (mid-track)
13-15	Aft 9"
16+	Full aft

Our shroud tension is measured with the shrouds in the middle location and the forestay and backstay totally slack: Uppers - 600 lbs. in all conditions; Lowers - 1/2" sag at spreader for light air, increasing tension to 600 lbs. at 18 knots and 800 lbs. above 22 knots. Our lower shroud tracks are ramped 1/2" steeper than the uppers to give relatively more tension to the lowers as both shrouds are moved aft.

Sail Trim and Rig Adjustment

Up to seven knots, trim the mainsheet hard enough to make the top batten parallel to centreline. In smooth water and high pointing conditions, trim harder to cock the batten slightly to weather. In choppy conditions, the batten must twist off slightly. As the breeze picks up, you will find it necessary to use quite a bit of mainsheet tension to keep the top batten from falling off. This mainsheet tension when combined with the backstay should be enough to keep the forestay under control.

In light air, the boom should be set 4" above centreline. Above eight knots, drop the traveller enough to keep helm and heeling under control. As the breeze increases, we find best results by increasing mast bend and twist instead of lowering the main traveller.

Backstay: There are two things the backstay does: Controls fullness in the main and forestay sag. This is probably the most important adjustment in the Soling. The more backstay tension the flatter the main, and the reduced forestay sag flattens the jib. I have my backstay marked at every two inches so I can repeat fast settings and have the boat two quickly after mark roundings.

Mainsheet tension: The mainsheet controls the top part of the mainsail. The quickest and most accurate way to trim the mainsail is to watch the top batten sighting from under the boom; the top batten should be parallel to the boom most of the time. Under ideal conditions (flat water), the top batten



SOLING TRIM – continued

can point 5° to weather of centreline, and when overpowered, it should open from centreline until it balances the helm.

Boom Vang: Our sails are designed so it is only necessary to use vang in a few situations. For upwind sailing, I use only enough vang to keep the mast from pumping, except in heavy air, when I occasionally use vang to reduce helm.

Traveller: The boom should be above centreline until both crew are over the side, then the traveller should be eased down to reduce weather helm. The traveller should be played with each puff in over 14 knots, but if the wind is steady, the backstay should be adjusted to depower the top of the mainsail and the traveller kept in the middle. Maximum out should be about 10" in 15-20 knots.

Jib Trim: For top performance in Solings, proper jib trim is paramount. The first thing to do is make sure you have a leech telltale at the top batten. Trim the jib so this telltale is always streaming straight back. If it starts to drop or wrap around the leech, ease the jib sheet a little

For proper jib luff tension, keep slight wrinkles in the luff. Once both of your crew are mini-hiking, tension the luff more to remove most of the wrinkles.

For Solings with a self-tacking jib traveller system, I suggest placing reference marks on the aft side of the splash rail. Put these on each side of the boat at 10 inches off the centreline. Then sail with the jib sheet crossing this mark, except in very light or heavy air.

The proper amount of headstay sag is about 3"-4". I use the fore and aft adjustable shroud tracks and backstay tension to control the amount of sag. If you do all of these things correctly, the jib will contribute greatly to your overall speed and pointing.

One of the first steps toward optimising windward performance in a Soling is to maintain the proper crew positions for both heel and reduction of pitching moment. In extremely light air, one crew should be on the leeward deck with the skipper and the other crew sitting on the leeward floor. As the breeze increases you always want to keep the angle of heel between five and ten degrees while at the same time keeping crew weight as low as possible, especially in chop. It is more efficient to keep one crew on the leeward floor if it enables the other crew to hike fully.

As a general rule, I usually keep the main trimmed firmly until I need to depower. The jib trim is more open, with the top batten telltale always flowing. I keep the boom to windward as much as six inches until both crew are dropped, at which time the boom is centred.

If you start with the jib tack about 3-3'9" above the deck in light air, progressive halyard and luff tape stretch will put the tack on the deck at about 15-18 knots. I usually start out with about 30° of rake, measured along the forestay, and unless the helm becomes too heavy as the wind increases, I prefer not to reduce rake.

When reaching with the spinnaker, always keep the spinnaker pole away from the forestay more than you think is right (never closer than one foot). For proper, heavy air close reaching, the forward crew should use both arms to pump the guy - twice - on the waves. Don't forget that unlimited pumping is legal to prevent a broach, and I don't mean timid pumps either!

REACHING

SPINNAKER HANDLING

by PAUL DAVIS

What is quite obvious to me after 20 years of being a middle man and bow man is that the principals of spinnaker handling are best learned on the water. My advice to the newer Soling sailor is to put in as many hours in the boat as possible while still having *fun*. As your skill level increases the enjoyment also increases.

The major difference, in spinnaker handling, is that the helmsman hoists the spinnaker on most European boats, while most North Americans have the boat rigged so that either the foredeck crew or the middle man hoist the spinnaker. These are matters of personal preference and all have proven to have good results. In our case the bow man hoists the spinnaker and of course we think that this is the best system.

The standard leeward hoist

We always start with the spinnaker packed or at least in its bag with the leeches organized. It is always best to preset the spinnaker boom before rounding the windward mark. The middle man goes to leeward and removes the spinnaker from the bag and sets it up on deck. A simple "GO" starts the whole process. The middle man throws the spinnaker out trying to make sure that the halyard is clear of the spreaders, the front man hoists and the helmsman pulls the guy as fast as he can to a preset mark that is sewn into the sheets. The

middle man in the mean time has picked up the sheet and moved his weight to the high side as fast as possible. If all has gone according to plan the spinnaker has filled with a band and the transom is now passing the windward mark. More often than not, things are not always as they were planned, but a few simple tips will help the process:

- ensure that the windward tweeker is trimmed down to the deck, (we have our tweekers between the front and middle man) and of course the leeward tweeker is slack, or at least, free to run.
- don't ease the jib sheet so much that the spinnaker sheet goes under the foot of the jib
- the middle man can let the leech of the spinnaker run through his hand on the way up to ensure that the spinnaker doesn't twist or "hourglass" on the way up.
- the front man must sometimes hold the pole forward to help the tack of the spinnaker come to the pole end.

The standard windward drop

The most common and preferred take down is the windward drop. We will have the spinnaker on the correct side of the boat for the next hoist, our weight is on the windward side of the boat during the entire takedown, the spinnaker is under control the entire time and there is no problem with leeward boats. The bow man first does a little house keeping. He

SOLING SPINNAKER HANDLING – continued

checks that the spinnaker halyard is free to run, resets the outhaul to its windward trim, checks that the jib and main travellers are in the right position and may help get the backstay set to its upwind trim.

The foredeck man takes down the pole in good time before the mark and places it on the correct side of the boom for the next hoist. He also makes sure that the spinnaker bag is open. The middle man gathers in the foot of the spinnaker and once that is done the bowman releases the halyard. The middleman stuffs the spinnaker in the bag while keeping control of the spinnaker leeches so that the spinnaker is ready for the next hoist. Like the hoist there are a few tricks that help the takedown process.

- a) if it's not too windy turn off the leeward ratchet so that the sheet runs easier
- b) if there is room, the helmsman can bear off slightly to help get the spinnaker around the forestay
- c) make sure that the tail of the halyard is not near the coil of the halyard
- d) coil the halyard so that the halyard runs off the top of the coil (or arrange for the helmsman to hoist the sail and lead the halyard to a take-up drum - Ed. note)

The leeward drop

The leeward drop is advantageous when the spinnaker will not be used again in that race or when you are so close to the wind that it will be difficult to pull the spinnaker all the way around the forestay or when you want the spinnaker on that side of the boat for the next hoist. The problem with the leeward drop is that it is very easy for the spinnaker to refill and slow the boat down.

The bow man goes through the same house-keeping procedures as with the standard drop but he can leave the pole up. The middle man will again gather up the spinnaker and stuff it in the leeward bag but he can wait on the high side as long as possible. If you are reaching the best way to get the spinnaker down quickly and in an organized fashion is to simply "blow" the halyard (with the guy and sheet cleated). After the halyard has been released the middle man can then go down and gather in the chute. The trick here is that when you are reaching and "blow" the halyard the spinnaker will float to leeward of the main and jib just above the water and will be easy to get on board.

The jibe set

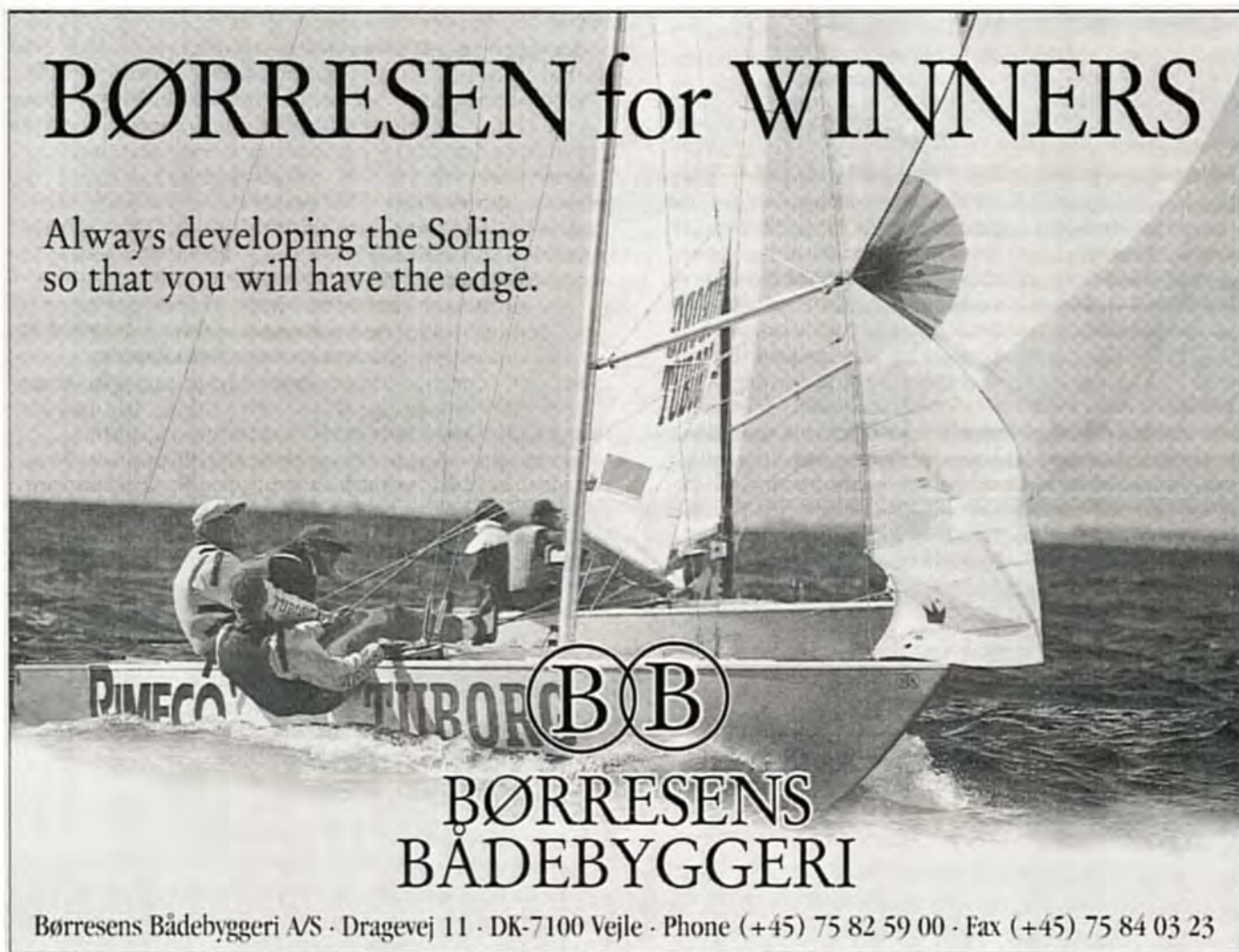
The jibe set should not be any more difficult than the standard hoist providing that the spinnaker has been arranged to be, after the jibe, on the leeward side of the boat. The manoeuvre should be executed relatively slowly so that the boat is held at top speed through the bear away and jibe. This is accomplished by keeping the boat at constant turning radius with out moving the rudder too much. The entire crew should use its body weight to help the boat through the turn. The spinnaker pole should have been preset to leeward before rounding the weather mark and the spinnaker ready to be hoisted right after the jibe. It is important to synchronize the crew so that everyone is ready when the hoist starts.

The jibe set with windward hoist

The windward hoist can be executed without too much risk of disaster if you are going dead down wind but if you are

BØRRESEN for WINNERS

Always developing the Soling
so that you will have the edge.



BØ
BØRRESENS
BADEBYGGERI

Børresens Bådebyggeri A/S · Dragevej 11 · DK-7100 Vejle · Phone (+45) 75 82 59 00 · Fax (+45) 75 84 03 23

SOLING SPINNAKER HANDLING – continued

reaching the only real possibility of surviving the windward hoist is to walk the spinnaker at least half way to the bow and throw the kite around the forestay. The two basic differences with the windward hoist is that the pole is not set until after the chute is flying and instead of pulling the guy into position the helmsman pulls the sheet. It is quite critical that the sheet is pulled quickly so that the spinnaker doesn't twist on the way up.

The pole up - windward hoist

This manoeuvre is primarily a match racing trick that gives you more flexibility with the decision as to what side the spinnaker is taken down on or which jibe you will choose on the run. The advantage is that the pole can be preset before the hoist, thus saving time after the rounding. To start with the spinnaker must be taken down (rigged) forward (inside) of the shrouds. The spinnaker pole is preset *but behind the spinnaker halyard*. The middle man throws the spinnaker on the foredeck and the helmsman starts to pull the sheet around the forestay, the bowman hoists. The middle man pulls in the guy to about 40 cm more than the reaching (jibing) mark sewn in the sheet.

Jibing

The spinnaker has now gone up and down a number of times but we still haven't changed jibes. Jibing the big soling spinnaker takes both practice and teamwork. Through the years I must have jibed many thousand times but every single time we are out sailing we do at least 20 jibes. The communication between the crew and the feel of the boat as it turns must be repeated hundreds of times before you can confidently jibe in all weather conditions and all sorts of traffic at a leeward mark rounding.

The reach to reach jibe

Most of us, especially North Americans, only ever experience a reach to reach jibe when we use the Soling Championship courses in the Worlds or a Europeans. This jibe is still very important because many elements are required when quickly jibing in match racing. On the approach to the mark the sheet is over the main boom and the first task is to get the leeward tweeker completely down to the deck. The bowman pulls in the main sheet directly from the boom and the helmsman pulls down the tweeker, so that it just clears under the boom. The middle man must ease out the sheet as the tweeker is pulled down. Our tweekers are led across the boat to the console and cross in the middle such that the leeward tweeker is on the windward side of the console. The middle man finds the reaching mark that is sewn into the spinnaker sheet that will be the new guy. It is normally about 2 small coils of about 30 cm of rope from the reaching position of the sheet to the new position of the guy. The helmsman begins to bear away and the front man goes up on deck under the spinnaker boom and to leeward so that he is ready to be on the new high side. The middle man cases the sheet and begins to square the pole as he follows the turn of the boat.

The helmsman pulls down the rest of the tweeker and the middle man squares the pole more. The helmsman releases the old tweeker as the boat passes dead downwind, the middle man cleats the new guy at the correct spot and the foredeck crew unclips the pole from the mast and the old guy. The bowman attaches the pole to the new guy as quickly as possible and pushes the pole forward; he pushes the pole against the downhaul and uphaul to keep the pole stable. With his back to the mast he pushes the pole forward the last few inches and clips it back on the mast. The middle man; after he has cleated the new guy can help the boom across and then with both hands pull in the new sheet without over sheeting at the same time making sure that the poor crew standing on the foredeck doing chinups has managed to get the pole into place.

Some tips to make things go a little easier:

- The tweekers should go through the deck between the front and middle man
- The uphaul and downhaul should be made of as low stretch rope as possible so that they don't get "shorter" when they are not loaded up (or when the foredeck crew is trying to put the pole on the mast).
- practice
- practice
- When practicing try to simulate the problems that will develop; the helmsman will turn quickly, the bowman will have trouble getting the pole on the mast, the boat broaches . . .

The running jibe is by comparison a piece of cake. Use crew weight to help turn the boat. All the weight to windward and the boat will bear off. A slight roll when jibing will help both the boat change course and the spinnaker move from one side to the other. The sheet and guy need very little movement: 30-50 cm back (in) on the old guy and 30-50 cm out on the new guy. The timing on the pole is quite important. It should follow the roll of the boat but should not impede the movement of the spinnaker. At the same time it must be attached quickly enough so that the spinnaker is held out to windward on the new jibe. The tweekers are of course held down so that the sheets are always under the boom. The tweeker on the new windward side should be tightened down on the deck and after the main boom has swung across the leeward tweeker can be eased 50 cm so the sheet can ride up to the boom.

The variation on this jibe is when the breeze is blowing *hard* and you find yourself with the spinnaker up and needing to jibe. I have been chicken sometimes and taken the spinnaker down to windward, jibed and put it up again. A safe move, but not especially fast and very hard to justify in the bar afterwards. The alternative is to sail with the spinnaker trimmed relatively tight into the boat and both tweekers down on the deck. With the entire crew in the cockpit the bowman leaves the spinnaker pole and instead helps jibe the main boom. (This is best done with the boat at top speed surfing down a wave). After the main is jibed and the boat is under control the bowman can jibe the pole and the kite can be eased out to it's normal position.

RUNNING

DOWNWIND CONSIDERATIONS

by SAM MERRICK

Over the past several years the Soling Class has promoted the importance of the traditional "run" downward either by eliminating the reaches entirely in light air or by swapping the run for the reaches after the first beat in the Olympic choreography.

Time was when the beat to windward was the major topic of every book on sailing. The reach got some attention, but the run was neglected except for ice boats, catamarans and scows. You got to the windward mark, scrambled getting the

DOWNWIND CONSIDERATIONS – continued

spinnakers set, then broke out the sandwiches and relaxed. Just steering to the leeward mark was sufficient. Although this is somewhat of an exaggeration, many sailors today, not exposed to VMG calculations, approach the run with little appreciation for the great gains available to them. They have skillfully applied their knowledge and experience on the beat, staying in phase, searching for more wind in the darker water and keeping a healthy distance from laylines. Having attained the windward mark, their attentions are apparently aimed toward getting downwind, in the general direction of the leeward mark, with enough deviation from the rhumb line to keep the spinnaker full (at least the visible pan of it)! Only a converging right of way competitor or an overtaking (wind taking) boat might change such an unimaginative course. However, there are a myriad of other considerations that will increase interest as well as racing performance on these downwind legs. Let's break out for close analysis only the principal elements necessary for successful downwind sailing.

1. *Get away from "traffic,"* not only those who are close astern disturbing your air, but those just ahead. If you are going to make gains with the techniques described here you are going to need manoeuvring room. A clearing hitch upwind has the equivalent effect downwind. Avoid luffing matches which can only lock you in to the calculations others are making and can take you quickly out of your own game plan. Timing your jibe away from traffic is crucial. A momentary wind shift or a distraction on a competitor's boat are both good opportunities for making your move.

2. *Go for darker water.* Wind comes in gusts and follows channels. You stay in the gust longer going downwind that you do upwind, because the boat's speed is added to the gust duration rather than subtracted as it is upwind. It is therefore a more significant influence on the boat's speed. You must take special steps to get your heads out of the boat to see the gusts. Looking ahead is so natural, but is really more useful going upwind. A good crew who knows that looking backwards downwind is more useful than looking ahead can be a great asset. The skipper should sit sideways downwind, so that by turning their head ninety degrees they can take in the whole panorama or the wind on the water. Steering the boat in the path of the gust gains places.

3. *Get on the jibe* (in the racing rules it's called tack) *which is appropriate for the wind direction.* Going upwind we are accustomed to tacking on headers and staying on lifts whereas downwind we must stay on headers (and steer down) and jibe on lifts. Elementary you might say. But the difficulty is in being able to identify exact wind direction and detecting wind shifts, a process that is immediately apparent upwind, but not down, especially in the lighter wind ranges. Speed loss can be felt and if it is not the result of less velocity, it is probably a windshift, a lift "Freshening," or heading higher (it will show on the compass) is one response, or a jibing (if the shift is confirmed) is another. All those telltales you've put everywhere on the rigging should be of great assistance if you've learned how to read them, not an easy task. Personally, I find a masthead indicator, with two reference points of greater value in detecting those shifts.

4. *Develop a sense of lay-lines.* The location of lay-lines (and frequent relocation) for downwind calculations is affected not only by wind direction shifts, but by changes

in wind velocity as well. For example: In a wind of five knots, you will get to the leeward mark soonest if you steer a course (let's guess) thirty-five degrees away from the rhumb line, assuming wind and rhumb line are aligned. As the wind increases, you can head lower so as to be able to reduce that angle to twenty-five or so. Thus, in the absence of wind direction change, the lay-line (another way of describing the ideal heading for a mark) will relocate itself. Contrast this with the simplicity of lay-line calculations going upwind. Except for the loss of a few degrees at the extremes of wind velocity or chop, the lay-line is a predictable angle to the wind's direction represented by the boat's tacking angle, whether the wind velocity is three or eighteen knots. The significance of downwind lay-lines needs no emphasis if you understand their upwind impact. Going past them is traveling extra distance. Going close, except near the mark, runs the risk that a windshift will relocate the lay-line with you outside, so you've already wasted distance compared to the boat positioning itself so as to remain within the lay-line cone.

5. *Sail enough so your boat communicates* its most efficient angle to the wind (VMG) in various wind strengths. Boats with instruments develop tables for this purpose. For those of us in small boats, seat of the pants feel is our only resource, a product of sailing experience. The different behaviour of Scows and Solings illustrates the point. A Soling, in eighteen knots of wind, with its keel, is in the grip of drag forces which will not let it exceed its directly downwind speed, will go no faster if headed at a different angle to the wind. However, as the wind drops below ten knots and less, the speed will significantly increase (enough to compensate for the additional distance travelled) as the wind's angle of attack becomes less. By three knots, it may be as little as fifty degrees (that is jibing angles of one hundred degrees). On the other hand the Scow (like an ice boat) will be slow dead downwind, even in eighteen knots. But freshen it fifteen degrees and there will be a huge speed increase immediately. The response challenge lies principally in the wind range between five and fifteen knots, in velocity, variations of two or three knots, conditions characteristic of most of our small boat racing. The key question (assuming no change in wind direction) is where to head the boat as the wind increases or decreases; how much more toward the leeward mark should the boat be headed to take advantage of a slight increase in velocity, and conversely, how much higher in decrease. You won't get answers to such questions on shore, you have to "feel" them. If you inject a wind shift into this illustration, it is easy to see why an onboard



DOWNWIND CONSIDERATIONS – continued

computer could be helpful. You can bet that computers were working hard, on both boats, in that 1983 America's Cup Race when Australia made up 57 seconds and passed Liberty on the run of the last race of the series.

6. *Perfect jibing technique* goes hand in hand with the application of these perceptions. Ideally, the spinnaker should remain full throughout the jibing manoeuvre, and the boat rounding to a wind angle that is appropriate to wind velocity and direction. There should be no reluctance, no feeling that it's a "big deal" to make a jibe, whether in the middle of a leg or near the leeward mark. The last point warrants very special emphasis. "Near the leeward mark" means within 200 feet, where it's tempting to head for the mark even though that's straight downwind and *very* slow.

COMMENTS BY STU WALKER

Sam is the past master at sailing downwind—so pay attention. I can't help but feel that there is a little missing, however—he doesn't explain why he's always where the gust will be before it appears, away from the next shift before it

occurs. In addition, use the compass. Before the start (revise as you go) record the headings for the rhumb line to the leeward mark, the median downwind direction, and 20' either side of that median downwind direction to represent the approximate sailing directions on each jibe. Before you reach the weather mark consider the shift pattern to determine the initially preferable jibe, i.e.: the one which better approximates the rhumb line at the more headed sailing angle.

Start the run on that jibe or, if in doubt, check the compass and the recorded data as soon as you round and jibe if necessary. Start the run free of traffic, if possible, but if one jibe is 40' off and the other on the rhumb line, there's no choice. In oscillating shifts, just as if sailing to windward, it's better to be in dirty air on the right (headed) jibe than in clear air on the wrong (lifted). And thereafter, use the compass. Have someone call it periodically. In a shift, with the pole in the same place, to keep the spinnaker similarly full, the heading will change and the compass will show it. When the other jibe better approximates the rhumb line (compare the recorded headings and estimate your expected sailing angle), jibe.

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 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 downwind 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.

CREWING

THE PRINCIPLES OF CREWING

1. Communication

A. WHAT THE CREW NEEDS FROM ME.

1. KNOWLEDGE

I'll give you as much training and understanding as possible. If you don't know what you should do, ASK - in advance.

2. ORDERS

Be alert to them, pay attention - particularly at critical times (starts, mark roundings, crossing other boats, etc.) Listen for my orders. Obey them as quickly as possible - But remember that it is more important to do it right than to do it fast! There is probably another job waiting to be done (which I am waiting to order) as soon as you finish this one.

3. MOTIVATION and SATISFACTION

Sailing well is extremely satisfying. If we sail really well, we will win and that is even more satisfying.

You contribute to that outcome by doing your job without distracting me and by obeying my orders as efficiently as possible.

4. APPRECIATION

When you do your job well, I will tell you so. If there is anything you like or don't like or any philosophical point you would like to make, tell me about it - after the race.

B. WHAT I NEED FROM THE CREW.

1. NO DISTRACTION

The greatest possible crew is the one of whom the helmsman is unaware.

2. SUPPORT

Let me know by word and deed that you too think winning the race is worthwhile and that you believe we can win it. Remind me that the race is always from here onward and that regardless of how far back we are (what mistakes we have made) we still have a chance.

Recognize that I may not always be right, but that I'm doing my best. Backing me is the only way to victory.

3. INFORMATION

Tell me what I cannot see or learn for myself (not what is obvious to all)! Time (before the start) compass headings, boat speed, leeway, and pointing relative to boats I cannot see headings of boats and wind velocity on the opposite side of the course. The approach of boats (particularly right of way boats) on opposite tacks (or jibes or from astern or to leeward before the start).

Tell me in a factual, unemotional, non-threatening tone. Always tell me how we are doing - slower than the boat on our weather quarter, about to cross clear ahead, etc. - to avoid confusion and because it is only our performance that I can control.

4. REMINDERS

Remind me what I told you to remind me, what I told you I planned to do whether to consider a change in sail trim (or sails) with a change in wind velocity, what the course to the next mark is, what the compass headings on the last beat were. Help me to avoid the big mistakes.

Not recognising an advantage to one side of the course (Category 11) Getting too close to the laylines too soon. Not knowing where and at what sailing angle the next mark is.

2. Boat Speed - Weight Distribution

The position of your weight has many important effects upon the boat's performance. (One of the major reasons (perhaps the only!) that you are on board is because your weight is needed).

A. STABILITY

Maintaining all portions of the sail plan at a constant angle of incidence to the wind is extremely important.

1. Move your weight carefully so as not to disturb the angle of heel or the fore and aft trim.

2. Move whenever necessary to keep the angle of heel constant let whatever angle I choose for the conditions) and the fore and aft trim constant.

3. Let me move first - I know the trim I want and I need to attain a position from which I can see and feel readily.

B. IMBALANCE AND FRICTIONAL RESISTANCE

1. Shift your weight so as to heel the boat to windward when running and to leeward when beating in light air: otherwise keep it level.

2. Shift your weight forward when running and aft when reaching in heavy air.

C. ACCELERATION or the prevention of deceleration while turning.

1. LUFFING

Shift weight to leeward so that the boat will heel and develop a windward yawing moment (reducing the need for excessive rudder angulation)

2. BEARING AWAY

Shift weight (or retain it) to windward so that the boat will come up right (or heel to windward) and develop a leeward yawing moment.

3. TACKING

"Roll tacking" (and "roll jibing") utilizes crew weight to facilitate the turn and to alter the direction and force of the apparent wind. Shift weight to windward until the boat is head to wind and the boat heeled to windward and then shift weight quickly to the new windward side.

4. JIBING

"Roll Jibing". Shift crew weight to heel the boat to windward and then shift weight quickly as the boom comes across to the new windward side so as to stop the turn.

D. FACILITATION of SURFING or PLANING

Rapid movement of crew weight to windward and forward and then aft is useful in initiating surfing or planing. Try to keep the boat upright and level fore and aft unless I tell you differently

3. The Jib

A. THE JIB IS THE MOST IMPORTANT SAIL ON THE BOAT. IT IS YOUR RESPONSIBILITY.

The jib sheet is the most important control of jib shape. Adjust it whenever:

1. The heading angle of the boat changes.

2. The wind velocity changes.

3. The boat speed changes.

B. If I say "Ease it" or "Pull it", I mean a quarter of an inch (not a foot!) unless I tell you differently.

C. KEEP THE LEEWARD JIB TELL TALES FLOWING AT ALL TIMES:

1. Before the start - I want maximum speed unless I tell you differently.

2. In light and fluky air, the jib can be eased more rapidly (and more efficiently) then the boat can be turned.

3. When rounding the leeward mark the apparent wind moves aft and to avoid stalling it, the jib must be trimmed very gradually.

4. Trim the jib according to the boat speed, fuller, more open, more twisted when the boat is going slowly (after starting tacking, hitting a wave, being in dirty air, etc.) and flatter, more closed, less twisted when the boat is going fast (after getting up to speed, in smooth water, in clear air).

D. BUT REMEMBER THAT THE JIB HAS OTHER CONTROLS AS WELL.

1. The jib lead position (if adjustable) may have to be adjusted laterally and fore and aft, particularly for changes in heading angle. When reaching it is usually impossible to displace the lead sufficiently far laterally, (so it should be displaced as far laterally as possible and the jib sheet eased.)

2. The Luff tension should be altered for major changes in wind velocity/or boat speed. Ease the Luff tension when the wind velocity decreases and/or the boat speed increases (smooth water). Increase the Luff tension when the wind velocity increases and/or the boat speed decreases (waves).

E. BE PREPARED FOR ME TO GIVE YOU ADDITIONAL SPECIFIC ORDERS MODIFYING OR COUNTERMANDING WHAT YOU ARE DOING.

4. Boat Handling

Rehearse in your mind what your duties will be before each manoeuvre: starting, rounding marks, tacking, jibing, luffing, bearing away, etc., Do what you have practiced. Don't be distracted (by noise, other boats, other members of the crew, non essentials).

PRACTICAL RECOMMENDATIONS

MASTS BREAKING

Many masts broke in the strong winds and short chop at Balaton - but many more survived. They break when they are suddenly exposed to a shock - as the bow hits a wave, as the spinnaker fills, as the backstay is released. They break where a hole has been cut in the leading edge (a particularly likely place is the site of exit of the spinnaker pole topping lift). They are most likely to break when the bottom portion of the mast is fixed - and the top is mobile - free to move in response to the shock. More masts broke at Balaton than would have broken in the same conditions ten years ago - because of shroud tracks.

Moving the shroud cars aft (behind the "null point") pulls the spreader tips (and the mast itself at the level of the spreaders) aft which stiffens the lower mast and prevents the transmission of bend and shock waves below the hounds. The unsupported upper mast, whipping about above the fixed hounds breaks off readily when shocked.

Mainsheet and backstay tension provide the only support for the upper mast; consequently, the mast is unlikely to break while sailing to windward even when the boat slams into a wave. It is before the start and on reaches and runs when the mainsheet and often the backstay are released that the mast is most likely to break, moderate backstay tension is supportive but, because it pulls the mast out of column,

excessive backstay tension and mast bend may facilitate breaking.

Recommendations for Heavy Air:

Before starting:-

Particularly if upper shroud tension is high (800 pounds or more), avoid pulling the shroud cars aft until on the start approach or at least only in the presence of moderate backstay tension.

At the Weather Mark

As you bear away around the weather mark, easing the mainsheet, ease (do not abruptly release) the backstay to a state of moderate mast bend. Next, if running or broad reaching, release the shrouds cars to the null position. Then, and only then, set the spinnaker. If desired, after the spinnaker is set release the backstay further gradually and pull the mast forward with the jibstay. Retain some backstay tension (against the jibstay) to support the upper mast and prevent reversing the mast bend (do not allow the mast tip to bend forward as the spinnaker pole drives the lower mast aft). It is equally safe for the mast (and permits better flattening and control of the spinnaker) to keep the mast aft with minimal backstay tension.

TECHNIQUES AND FITTINGS

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 aluminium 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 Meiges and others.)

TECHNIQUES AND FITTINGS – continued

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 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 (61/2°) 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 aluminium 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).



TRICKS

by **DAVE CURTIS**

1. Construct upper shroud track ramps absolutely perpendicular to mast in its raked position. Then with movement of the cars forward of the mid-mast position, upper shroud tension increases to increase pre-bend in light air and with movement aft shroud tension increases to increase mast stiffness in heavy air. By increasing rake in light air and decreasing rake in heavy air one can increase these effects. (Or one can ramp the tracks down forward to increase pre-bend and extend them aft to increase stiffening.)
2. As the mast grows older and less stiff, position the shroud cars for various wind strengths one position farther aft than usual.
3. Keep shroud cars in the mid-mast position (once there) for any winds between 6 knots and 16 knots - as they are close to being right and it is distracting to move them frequently.
4. In less than 3 knots go for speed - all leeches open and the boat pointing down:
5. The relationship between mainsheet and backstay tension is critical but difficult to quantify. For gusts alter backstay tension first. For gradual alterations in velocity alter mainsheet tension first and then adjust backstay if necessary.
6. Check the number of jib hanks that are visible from a usual sitting/hiking position on the windward side of the boat and use this as a guide to jibstay sag.
7. Don't bring the shroud cars aft of centre too soon. Bringing them back to position 4 alters one's thinking - and causes one to set everything else too tight - too flat. And it is far better to be overpowered (and easier to detect) than underpowered.

ISA COMMITTEE

Full details of the current ISA Committee are listed in the latest *Soling Sailing*. This information may also be obtained from the ISA Office - see below.

ISA SECRETARIAT

P.O. Box 2, Bordon, Hampshire, GU35 9JX. United Kingdom.
Tel. +44 (0) 1420 472293 Fax. +44 (0) 1420 476067
Secretary/Treasurer: Mrs. Dinny Reed

HOW TO JOIN THE ISA

Each member nation of the International Soling Association has its own National Soling Association, and individuals should contact the NSA in their own country for details of membership. The contact names and addresses of these NSA's are available from the ISA office.

SOLING SAILING

The Class magazine, "Soling Sailing", is circulated by the ISA office to all paid up ISA members.

Anyone wishing to insert News, Letters to the editor, Boat-for-sale advertisements, or any other material, should submit copy to the ISA office.