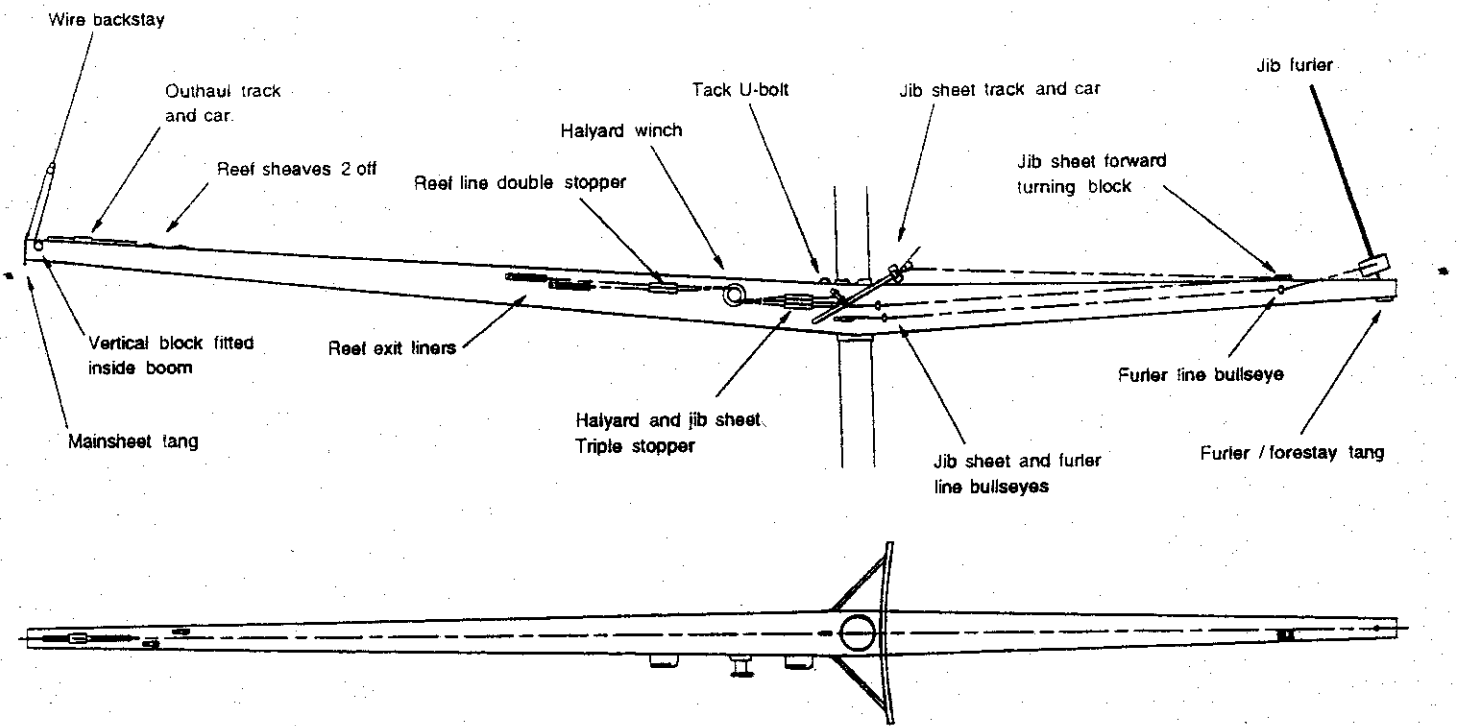


4. LAYOUT

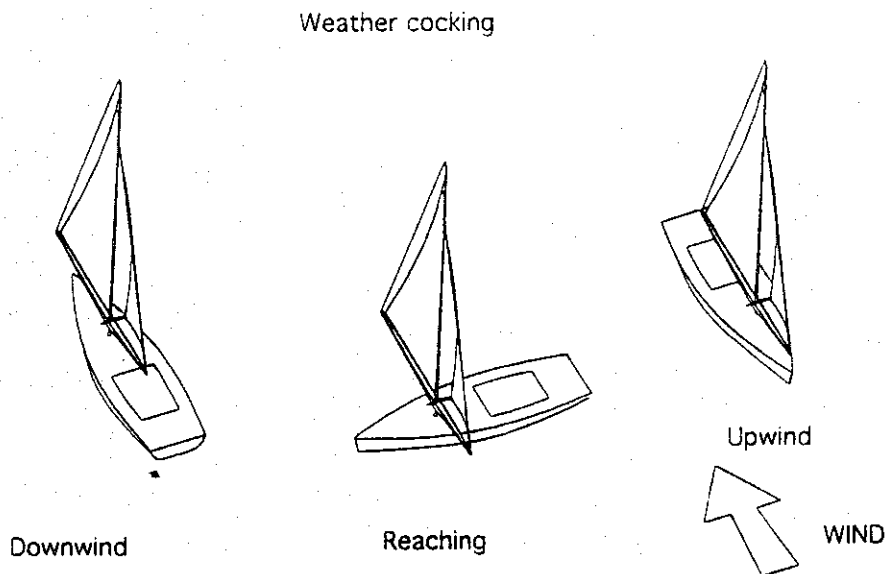
Typical Fitting Layout for AeroRig Boom



5. SAILING WITH THE AERORIG

5.1. FUNDAMENTAL RULE

The weather-cocking facility is the most important single safety feature of the rig. The ability to be able to ease the sheet and let the rig rotate to align with the wind provides the possibility of easing the power and load on the yacht on any point of sailing. The rig is designed so that the centre of pressure is aft of the mast to permit this to happen.



To maintain this facility it is important that the mainsail is always hoisted before the jib (in other words the projected area of the jib must always be considerably less than that of the main). Therefore in any sail handling manoeuvre, the jib must remain furled or be furled prior to the hoisting or dropping of the main i.e:

Hoisting - always hoist the mainsail first.

Dropping - always furl the jib first.

Reefing - always furl the jib first.

Shaking out a reef - always furl the jib first.

DEPOWERING, SLOWING DOWN OR EMERGENCY

Easing the mainsheet sufficiently on any point of sailing will remove the drive from the yacht, permit the yacht to come upright, and reduce the speed of the yacht. Furthermore on any point of sailing any intermediate position of the mainsheet will increasingly provide or remove drive.

5.2. LIGHT AND MEDIUM AIRS

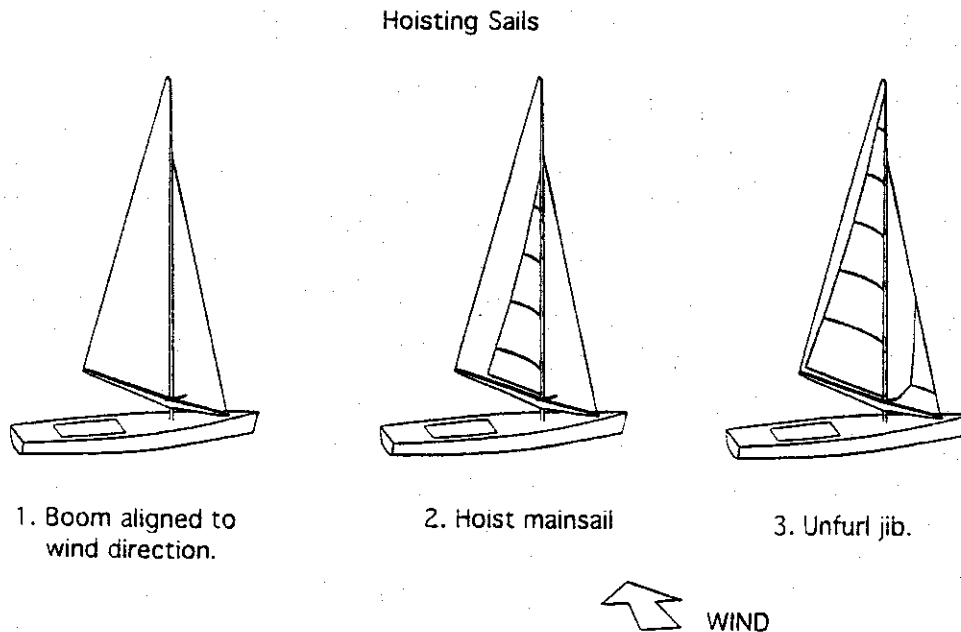
The two-sail rig plan, single line control and semi-balanced nature of the rig enable the same basic techniques to be applied through a wide wind range. Depending on the relative sail area to weight ratio of a particular yacht it is often possible to sail the AeroRig® up to Force 5 or 6 before special considerations are required.

5.2.1. HOISTING SAILS

Hoisting operations can generally be carried out on any point of sailing. The procedure is:-

- Ease mainsheet so that yard is free to rotate and align with the wind angle as the sail is hoisted.
- Hoist mainsail. A useful tip is to ensure the yard is totally free to rotate and then the fully battened mainsail will automatically seek to line up with the wind angle and pass through the lazy jacks - let the wind do the work. Continue to allow yard to self-align.
- Unfurl jib. Sheet jib relatively hard on the winch as if for upwind sailing.
- *The rig will now lie idly to the wind angle gently slatting backwards and forwards over a small angle with the fully battened mainsail not flogging nor the jib flogging.*
- Pull in mainsheet and commence sailing.

Note that this operation can even be carried out on a deadrun with the rig rotated through 180°.



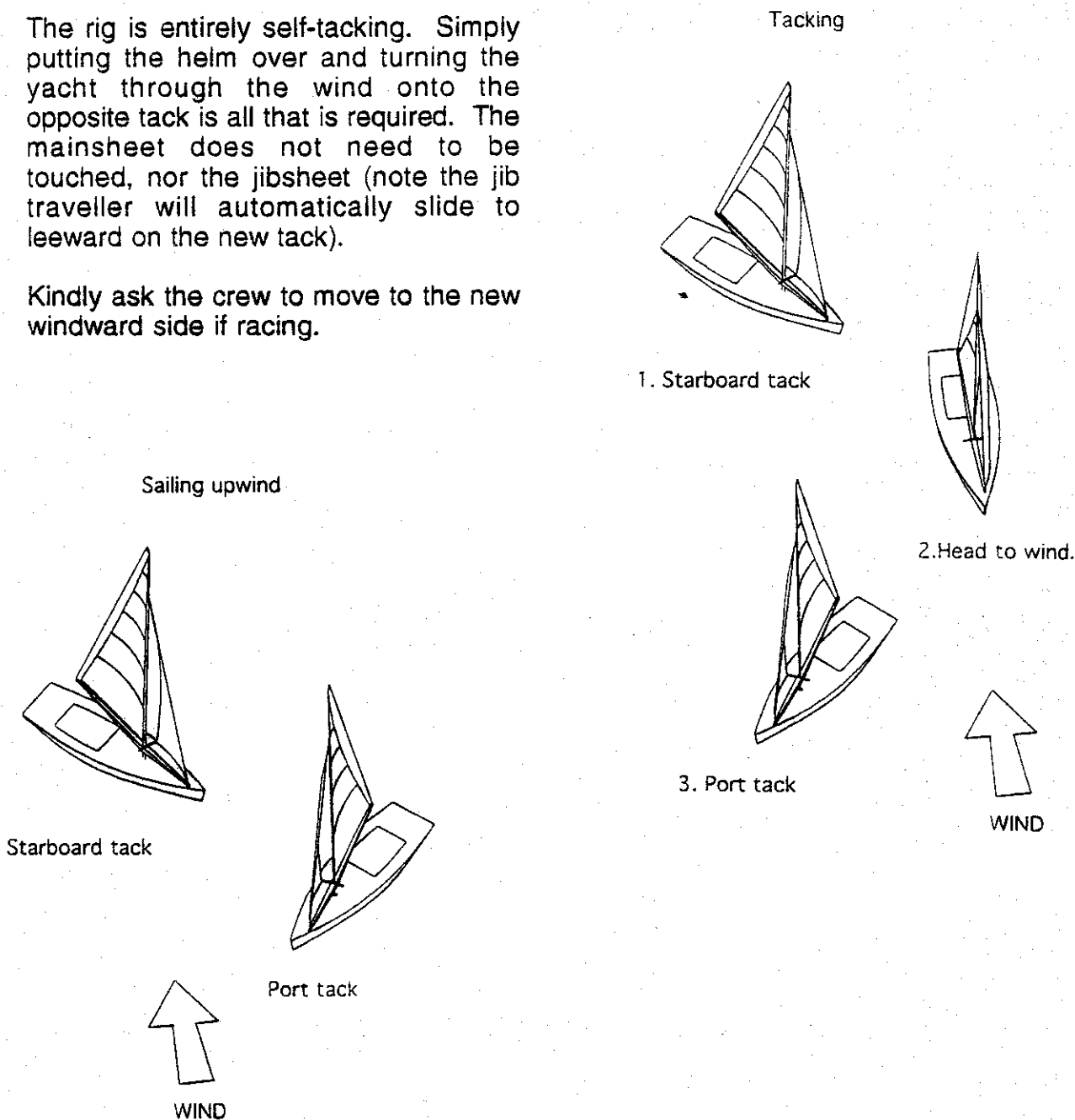
5.2.2. UPWIND - Cont'd

- Maintain reasonable outhaul tension on the mainsail. As wind strength increases, increase outhaul tension will flatten the bottom of the sail and improve efficiency.
- Once the yacht becomes pressed, rather than reef the main, the backstay can be pulled tight, bending the topmast and depowering the top of the mainsail, thus reducing the heeling force. This is a useful way of permitting the yacht to be sailed more comfortably upwind in higher wind strengths.
- Maintain reasonable jib luff tension, above comments for the mainsail apply equally to the jib in this respect.

5.2.3. TACKING

The rig is entirely self-tacking. Simply putting the helm over and turning the yacht through the wind onto the opposite tack is all that is required. The mainsheet does not need to be touched, nor the jibsheet (note the jib traveller will automatically slide to leeward on the new tack).

Kindly ask the crew to move to the new windward side if racing.

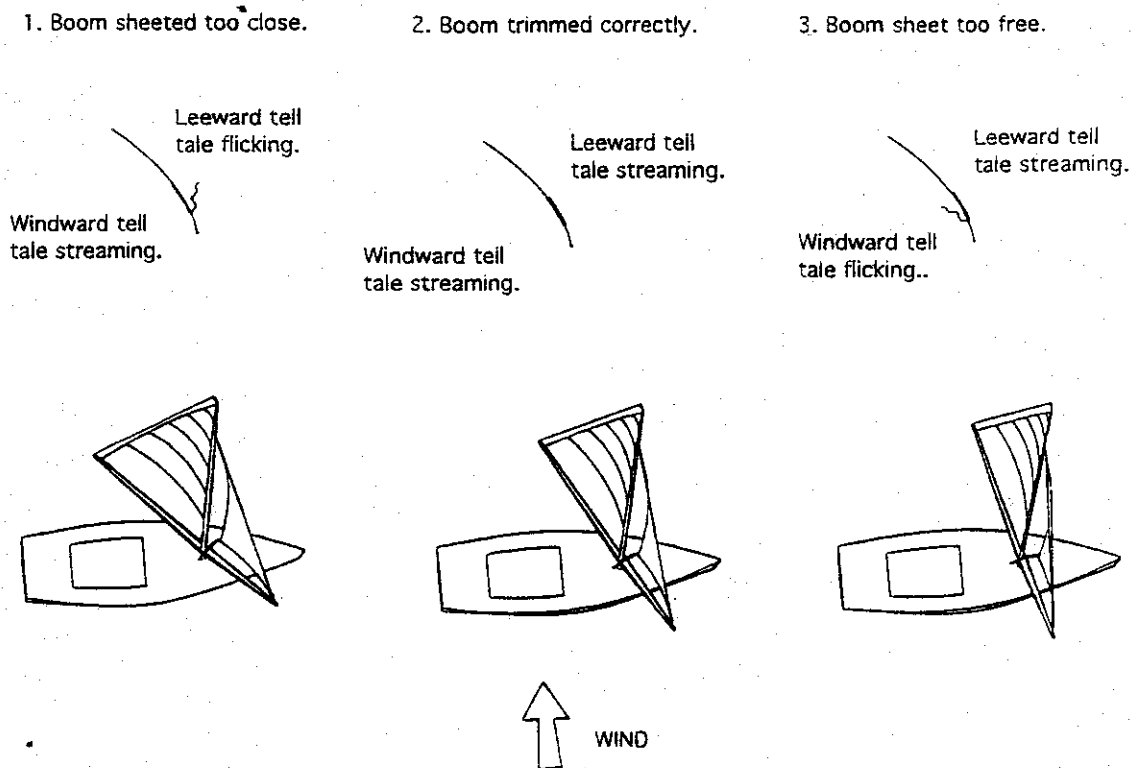


5.2.4. REACHING DOWNWIND

All sail trimming is carried out using the mainsheet. As the yacht bears away onto the new point of sailing the mainsheet is eased. The tack of the jib automatically swings to windward maintaining the correct aerodynamic slot and hence high efficiency.

The rig should be trimmed in exactly the same way as if it were going upwind, i.e. by keeping the rig at a relative angle of 30° approximately to the apparent wind. For those with wind instrumentation this can readily be observed on the wind angle readout or the exaggerated wind angle facility. For those without wind instrumentation then the rig should be set so that the jib does not flutter and precise control can be established using the tell-tails. Assuming the yacht is sailing a straight line, on a compass course for instance, then

- Windward tell-tails fluttering, leeward tell-tails streaming in line, yard is slightly too close to the wind. Pull in sheet slightly (puts more pressure onto the rig).
- Windward tell-tails streaming in line, leeward tell-tails fluttering, yard is too far off the wind. Ease out sheet slightly.
- Windward tell-tails streaming in line, leeward tell-tails streaming in line - excellent, keep on sailing.



As the yacht bears away further from the wind onto a beam reach then this sail setting technique can be used until the mainsheet is eased to a point where the yard is at right angles or fully abeam the yacht.

5.2.4. REACHING DOWNWIND - Cont'd

Broadreaching/Running

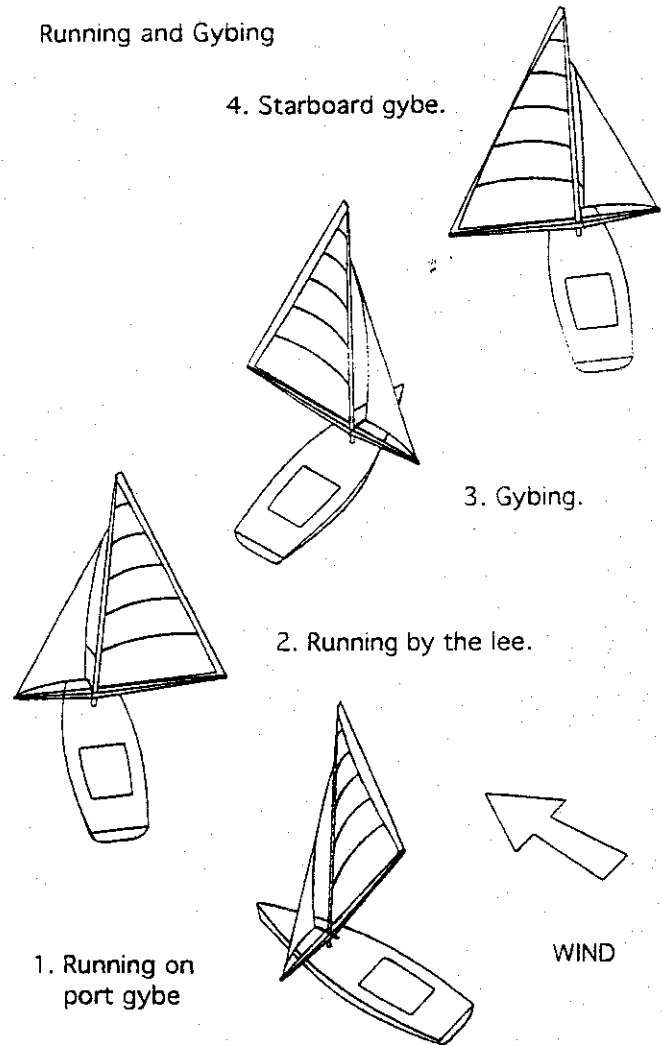
Once the apparent wind becomes substantially aft of the beam the rig is left trimmed in the maximum out position to give maximum projected sail area.

Note no trimming is required to either the mainsheet or to the jibsheet at this point of sailing.

This downwind sailing shows the AeroRig® at its best with maximum drive being available at all times on all points of sailing. Furthermore as the centre of effort of the rig is close to the centreline, which is due to the fact that a substantial part of the sail area is located to windward, then the yacht steers more easily and self-steering systems will not be worked too hard in normal sea conditions. *

The AeroRig® yacht can be deadrun without fear of the consequences of an all-standing gybe as the yard will not gybe until the yacht is running substantially by the lee, perhaps by as much as 30°-40°.

Running and Gybing



5.2.5. GYBING (SOFT GYBING)

Gybing is one of the most delightful manoeuvres to carry out on the AeroRig®.

Once on a deadrun with the yard set square to the yacht the helmsman simply turns the yacht through the wind by bearing away. This bearing away manoeuvre can be quite gentle or can be an aggressive full turn of the rudder. Eventually as the turn continues the jib will start to flutter gently showing that it is in the lee of the mainsail. Further bearing away will permit the wind to get round the mainsail and rotate the rig automatically. As the rig rotates the jib will act as a damping force preventing the rotation speed of the rig increasing excessively. As the yacht is so far by the lee, the AeroRig® will feather out (or weather-cock) on the new gybe without bouncing hard up against the end of the mainsheet.

Care needs to be taken that the mainsheet does not catch on any object or person during this manoeuvre. The position of the mainsheet attachment is selected to minimize this occurring but this will vary from yacht to yacht and depends on the deck and cockpit layout.

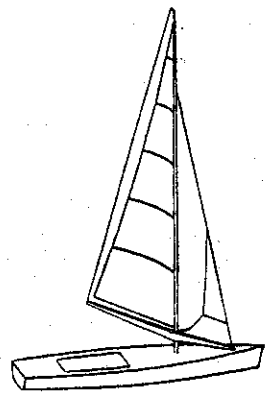
5.2.5. GYBING (SOFT GYBING) - Cont'd

Once the gybe has been completed the yacht can bear away or luff up onto the new course and the sail be trimmed accordingly.

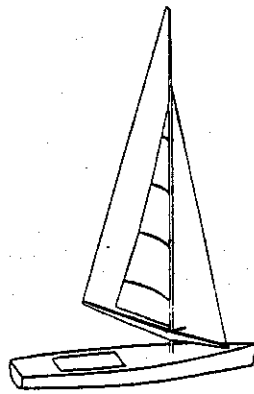
This gybe is soft and forgiving due to the semi-balanced nature of the rig and it is important that this should not be attempted under mainsail alone. Advanced sailors may often be tempted to steer the yacht back under the mast during the gybe but this is not necessary nor desirable for the AeroRig® as the feathering out of the yard in a new gybe prevents the loading up of any fitting.

5.2.6. DROPPING

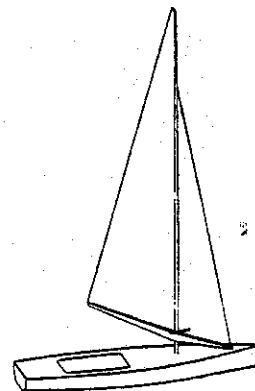
Dropping Sails



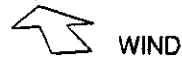
1. Furl jib.



2. Lower mainsail.



3. Look for sail ties.



Sail dropping can be carried out on any point of sailing. The rig should be allowed to rotate and weather-cock by easing the sheet. Once completely weather-cocked the procedure is as follows:

- Furl the jib completely.
- Drop the mainsail by easing the main halyard (ensure lazy jacks are tight if for some reason they have been loosened during the sailing).

The mainsail should drop relatively easily provided the rig is lined up with the wind direction.

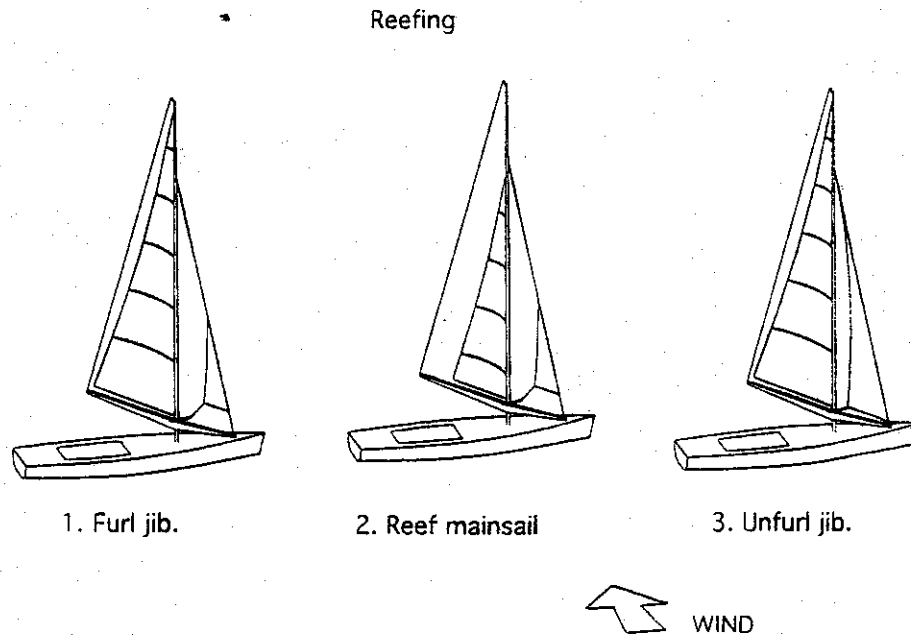
Once sails are stowed the mainsheet can be pulled on to bring the yard back towards the centreline of the yacht.

5.2.7. TAKING IN A REEF

Reefing the AeroRig® is carried out by slab reefing the fully battened mainsail in the conventional way with the mainsail being automatically stacked by the guiding lazy jack lines. Reefing the jib is by means of the roller-furling system.

Reefing can be carried out on any point of sailing. It is important that the sequence of events is as follows to ensure that the rig can weather-cock automatically at any time during the manoeuvre.

- a) Completely furl the jib.
- b) Ease the sheet so that there is little or no pressure on the sheet and the rig (under mainsail alone) is weather-cocked.
- c) Take in slab reef to the first reef point in the main in the normal way:
 - ease main halyard sufficiently so that the luff reef point can be attached to the snap shackle or horn;
 - re-tension main halyard;
 - pull in reef clew line using the winch watching to make sure sail does not get trapped in the line.
- d) Once the mainsail is reefed to the first point the jib can be unfurled and set to its full size.



Note the AeroRig® is designed so that the rig will weather-cock with full jib and the mainsail reefed to the first point. In this configuration the centre of effort is much closer to the point of rotation and the load in the mainsheet is greatly reduced. This means that in higher wind strengths, which could typically be Force 5, (but will vary depending on the yacht) the actual sailing load in the rig becomes less.

5.2.7. TAKING IN A REEF -Cont'd

Once the rig is reefed to this point it can be sailed and trimmed in exactly the same way as the unreefed rig described above and all the above manoeuvres both upwind and downwind can be performed in exactly the same way. It should be noted that because the balance is better, gybing in these heavy airs is in fact softer! Once again the AeroRig® yacht can be deadrun without worry of the unplanned effect of an all-standing gybe.

5.2.8. TAKING OUT A REEF

Similar rules apply to taking out a reef. This operation can be carried out on any point of sailing and again it is essential to consider the weather-cocking requirement at all times during the operation. The mainsheet should be eased to permit the rig to weather-cock and the following procedure should be adhered to.

- a) Completely furl the jib.
- b) Ease the sheet so that there is little or no pressure on the sheet and the rig (under mainsail alone) is weather-cocked.
- c) Take out slab reef in the normal way:
 - ease main halyard sufficiently so that the luff reef point can be detached from the snap shackle or horn;
 - let go reef clew line stopper, on a large yacht the winch should be used to ease out the line;
 - hoist main on halyard winch and recleat.
- d) Once the mainsail has been fully hoisted the jib can be unfurled and set to its full size.

Pull on the mainsheet and recommence sailing.

5.3. HEAVY AIRS

The same techniques are generally used in heavy airs. The unique ability of being able to feather or partially weather-cock the entire rig on any point of sailing gives the AeroRig® yachtsman the possibility of easing the power and heeling moment in heavy airs. This can be as a temporary means of riding out a short gust or a method of depowering if the wind is just slightly too much to be comfortable.

5.3.1. FURTHER REEFING

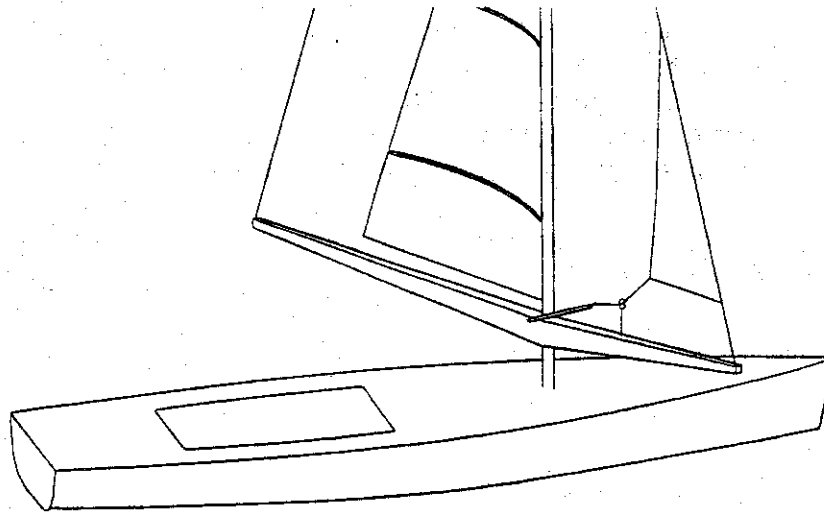
Following the first reef manoeuvre described above the next sail reduction could be either to furl the jib totally/partially or to take a second reef. Furling the jib may be useful for short periods but is inherently less desirable as it removes the balanced aspect of the rig handling. This means the mainsheet will be loaded more heavily. Therefore the more normal approach to heavy airs will be to slab reef the mainsail down to the second reef point, and the procedure is as follows:

5.3.1. FURTHER REEFING - Cont'd

- a) Completely furl the jib.
- b) Ease the sheet so that there is little or no pressure on the sheet and the rig (under single reef mainsail alone) is weather-cocked.
- c) Take in slab reef to the second reef point in the main in the normal way:
- d) Once the mainsail is reefed to the second point the jib can be partially unfurled. **It is important not to totally unfurl the jib otherwise the rig will become unbalanced.**

In practice it is very easy to progressively unfurl the jib to achieve good balance between the main and jib. Aim to thus reduce the sheet load to a reasonable working value.

On large yachts a jib restrictor line can be used to increase the leech tension.



Reefed jib trimmed with jib sheet barber hauler.

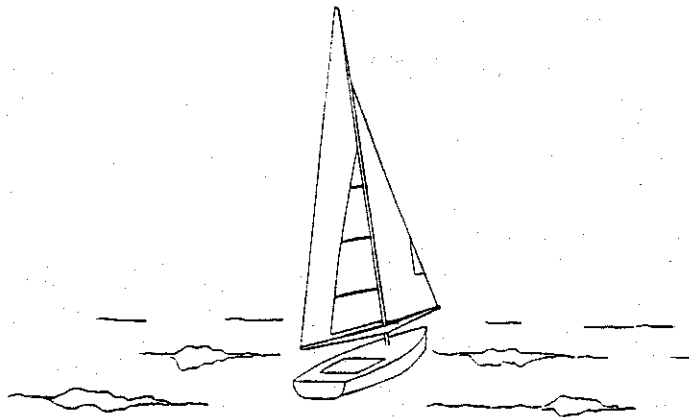
With a double reefed mainsail and the partially reefed/furled jib the AeroRig® is very manageable in high wind strengths. The fully battened main will not flog. The entire rig can be partially or completely feathered to reduce yacht speed and heeling. The lightly loaded mainsheet (due to the balanced nature of the rig) also contributes to safety.

Sailing upwind and downwind would be similar to that described above with the sail angle controlled by the mainsheet to the appropriate point of sailing.

5.3.2. HEAVY AIRS DOWNWIND

With the balanced but heavily reduced sailplan described above the yacht can be sailed downwind in the normal way. Should boat speed become too high for the prevailing sea conditions then the mainsheet can be eased to permit the rig to weather-cock and the boat speed will reduce.

By keeping the rig balanced the centre of pressure of the rig is close to the centreline of the yacht and consequently the yacht is more likely to track straight, hence steering is easier. As in the full rig case the yacht can comfortably run dead-before the wind knowing that a gybe will not occur until this boat is some 30°-40° by the lee. Should a gybe inadvertently result then it will be a soft gybe even in heavy airs.



Hove to with fully reefed main and furled jib.

5.3.3. HEAVY AIRS UPWIND

With the yard pulled in to the quarter and the balanced rig of double reefed main and part furled jib, the yacht can be sailed upwind.

As the AeroRig® centre of effort is always just behind the mast the balance and feel of the rudder in heavy airs will be the same as in full sail conditions, ie. the sailplan balance point stays in the same place with the AeroRig® in all reef conditions. See diagram above.

The jib can be fully furled and the yacht sailed upwind under two reef main.

Tacking is as per full sail configuration.

Sailing upwind in heavy seas will induce some fore and aft movement in the mast due to the pitching moment of the yacht. The lower weight and substantially C of G of the AeroRig® will however reduce the pitching compared to a standard rigged yacht. Although the movement of the rig can be seen from the deck of the yacht in real space its movement will be less than the conventionally rigged yacht.

5.3.4. STORM

All sails can be lowered and furled in the normal manner. The clean nature of the rig (no rigging) will reduce the windage and be of assistance in storm conditions although the higher yard will create some windage in the sea conditions of a storm this extra windage will be less significant than the saving in windage higher up in the spar.

5.4. MOTORSAILING

When passage making and cruising very often judicious use of the engine will be of great assistance to keeping up average speeds, comfort on board and maintaining the desired direction of travel. The AeroRig® lends itself ideally to motorsailing. The fully battened mainsail does not flog, neither will be the sheeted jib. As the sails are off the deck and there are no sheets to flog around there are less hazards than in a normally rigged yacht.

Substantial speed increases or alternatively fuel saving can be made by motorsailing in light airs or very heavy airs.