

Handling Notes

Leaving the Beach

The 49er is different from most other boats because of the effect of the fully battened main and the light hull weight. It has often been said that leaving the beach is the hardest part. Here are a few tips to make leaving the beach easier.

Holding the Boat in the Water

A 49er with its sails up has to be thought of in terms of those sails and where the person holding the 49er is with respect to them and the boat. First, by holding onto the boat via the wing, this places the crewperson another 1m further outboard from the centreline of the boat, and in particular, another 1m from the center of effort of the sail (CofE), a technical term for the point around which the sail is operating. What this means is that in any gust the boat has relatively more arm to try and spin it around. Do this by heeling the boat to windward. The more the boat is pulled over to windward, the more the distance is reduced between the crewperson holding the boat and the sails' centre of effort. Don't go too far or it will spin around the other way. With practice one person holding the forward tip of the wing can easily control the boat and point it in any desired direction. Do not be concerned if the battens pop to windward; this in fact further reduces the turning tendency.

Leaving a Windward Shore

The forward hand is in the water holding the boat. The helm gets in and puts as much rudder down as possible; then also enters the centreboard but leaves it up 500 mm or so. The forward hand holds the boat heeled to windward and at the appropriate moment the jib is sheeted in, the main is left unsheeted and the crew heels the boat even further to windward so that the wing is in the water and slides over it into the boat. The skipper bears away hard and steers the boat away from the beach.

The reasons for these actions are as follows:

- The boat is heeled to windward so that it remains under control.
- The centreboard is left half up so that the boat can side slip while leaving the beach, allowing the boat to attain the correct courses and speed in the quickest time possible.
- Only the jib is sheeted in, again to blow the bow away from the shore.
- The boat is heeled to windward excessively so that the center of effort of the sails is to windward of the hull also helping the boat bear away.
- The crew slides onto the wing because as the boat does bear away and the boat starts to heel, that is where they will be needed if there is any wind.

Further, if the wind is fresh then getting a fair bit of downhaul on prior to leaving the beach, will help de-power the main and also allow it to twist off a lot more and make the manoeuvre easier.

Leaving a Leeward Shore

First establish the best angle for leaving the beach and set up for that tack. Again the forward hand should hold the forward wing tip while the skipper hops aboard and puts as much rudder and centreboard down as possible. About 400mm of each is required to be able to get underway, so this can all happen in quite shallow water. Again the crew heels the boat to windward for control. When everything is ready the skipper first trims the jib but not right in and then trims main sheet but again not right in. As the forward hand feels the wing start to lift he/she climbs aboard by sliding on or rolling in. The skipper should concern him/herself first with speed rather than height especially if there is a seaway running, so do not be concerned if not much distance is made on the shore - it is more important to accelerate freely. Unless it is a case of trapeze or capsize, it is important during the acceleration phase to curb the tendency to get out on the wire, because with only 400mm of centreboard down a high side load will only lead to a massive increase in drag. To maximise drag reduction, keep the weight forward. As the boat starts to move more freely more height can be obtained, also more side load can be applied and once adequate depth of water is achieved, increase the amount of foil down.

While there is little rudder down, it is particularly easy to over power the rudder with the sails, so it is necessary to help steer the boat with the sails, if the jib is trimmed on, the boat will tend to bear away, if the main is trimmed on then it will tend to round up. If a tack is made while there is only limited foils down then use the sails to help the tack by sheeting in the main prior to the tack and easing later and ensuring the jib is on once the boat is past head-to-wind to pull the boat away.

The heavily twisted sails in the first instance will lower the center of effort and therefore ensure that whatever centreboard is down is used to maximum effect to drive the boat forward rather than resisting crew induced side load.

Returning to a Windward Shore

Simply remember that the centreboard draws only 1200mm when fully down and the rudder around 800mm, if the centreboard is pulled up 300-400mm then the boat can be brought right in to the shore and the crew can jump out without getting too wet. If the wind is fresh the boat will be hard to control as it is manoeuvred onto its trolley. It is better to drop the jib while holding the boat in the water, and the main too if necessary. The boat can then be manoeuvred onto its trolley with ease.

Returning to a Leeward Shore

Plan your approach and come in with speed to within about 30m of the shore or in about 2m of water. Round the boat up head to wind. If conditions are difficult send the crew over the side to hang onto the bow (this can happen in the rounding up procedure) and simply drift backwards onto the shore. It is a good idea to get the rudder out first and then the centreboard so that if there is a side gust the boat cannot pivot around the rudder in an uncontrollable manner.

There are many variations on this theme especially if the conditions are mild, in that the boat can be steered backwards and positioned very accurately by using the mainsail as a wind rudder in reverse. This requires practice.

Returning to a Narrow Ramp

This is the same as for the leeward or windward shore but have the main and jib halyards prepared for a very rapid drop. Sometimes it is a good idea to have them off their hooks and tied with a slip knot to the travel saddles.

Tacking

Even though a 49er is about the same all up weight as a 470, tacking can be more tricky because the 49er will be travelling at a higher starting speed, during the tack the rig will develop more aerodynamic drag due to its size so the 49er will slow down at a greater rate and there is a greater distance to cover during the tack, as well as the added task of the skipper getting onto the trapeze.

Additional dynamic factors are that the 49er has quite big sails, as a % substantially bigger than the rudder, and although the rudder is more than big enough to do its job while under way, the situation when it is moving slowly through a tack is one area where some assistance is a good thing. So experiment with easing the jib sheet while going up wind and pulling the main sheet on. Try differing amounts of easing. By easing the jib sheet and pulling the main on this will move the Center of Effort (CofE) of the rig aft, well behind the Center of Lateral Resistance (CLR) of the centreboard and therefore make the boat want to round up, and if not countered by the rudder, the boat will go into a tack.

Also, the lines of a 49er are such that if the boat is allowed to heel to leeward, two things will happen:

- The first is the most obvious, the leeward chine will be driven deep into the water, which in turn will severely limit the rate of turn.
- The second is that by allowing the boat to heel the CofE (Note 1) will be moved to leeward of the CLR instead of being directly above which in turn will generate a yawing or turning action to leeward (due to the drag of the rig), counteracting the action of the tack. Conversely a heel to windward will have rig drag assisting the rotation of the tack.

(NB: The Center of Effort of a 49er is approximately 2.7m above the sheer line and in the normal operating windward setup is 350-450mm behind the mast.)

On a technical note, due to the rapidly slowing speed of the hull during the period of the tack, the rate of turn at the start of the tack should be substantially slower than at the end.

In a perfect tack with constant speed, the rate of turn will be accelerated into the tack, maximum at the middle and progressively decelerated towards the end, much like a sinusoidal curve. But due to the rapid deceleration during the tack, this sinusoidal curve will be skewed towards the final stages rather than the middle.

The universal rules for a good tack are:

- Keep the boat flat or heeled to windward, especially prior to the tack.
- Ease some jib sheet, about 100mm in normal conditions, 200mm in fresh to frightening, keep the main in as the tack is commenced and ease it as the tack is completed.
- Steer in slowly to a maximum rate of turn about 70% of the way through and pick a spot 90 degrees to the initial heading prior to the tack so the boat is on the correct heading with the jib pulling the 49er out and forward and everything in control.

Something that works on all boats is that as a boat is turned into a tack the boat pivots around the centreboard, which in turn means that the jib will be moving to windward and the main to leeward, which in turn means that the apparent wind with respect to the jib is lifting and with respect to the main, is knocking. This reinforces the need to ease the jib and keep the main on, so that the sails more closely reflect the changing apparent winds and so that they more easily allow the boat to turn.

It is a natural tendency to move aft in a tack; in hydrodynamic terms this is like applying a drag brake to the boat. Keep as far forward as practical especially in light airs.

There are two commonly used techniques which can easily be denoted as skipper first or crew first, choose which suits the best.

Tacking Technique - Skipper First

1. Skipper calls a tack, crew eases the jib.
2. Skipper has the main in his/her hand and moves off the wire and onto the wing, unhooks off the trapeze.
3. Skipper calls the final stage of the tack and pushes the helm down.
4. Boat starts to turn and crew (who has already unhooked and is hanging by the handle) watches the balance and starts to move inwards as the boat starts to heel to windward.
5. By this stage the skipper has moved onto the new wing, has turned and is facing forward.

6. Crew comes across and moves straight onto the wire.
7. Crew takes the main sheet and trims both it and the jib sheet as the boat comes up to speed.
8. Skipper hooks up and moves on to the wire.

Tacking Technique - Crew First

1. Skipper calls a tack, crew eases the jib sheet and unhooks.
2. Skipper starts to head up and crew moves inward across the boat. (Once experienced the crew grabs the main sheet close to the block as he/she goes past the center line.)
3. As the boat starts to roll to windward the skipper pulls him/herself up vertically on the trapeze wire (which unhooks the trapeze) and starts across the boat (running) which also takes the helm further down and accelerates the tack.
4. By this stage the crew has reached the other side and assumes the responsibility of balance as the skipper, looking forward, lets go of the old tiller extension and grabs the new one and the trapeze handle with the new respective hands and moves straight onto the wire (if needed), unhooked but hanging by his/her arm. The crew may be in exactly the same situation.

The manner in which they get hooked up and settled varies. Juliani's technique, when in form, is that he does not touch the handle at the end of a tack but hooks up on the fly and does a bit of a twist so as not to hit the wire with a thud. Good crews simply tack so that they complement the balance and timing of the helm and if the helm is slow then the forward hand will hook the helm up. If conditions are such that two crew on trapeze are not needed immediately then the helm may take the main back again or trim in the jib for the crew so they can concentrate on main trim.

The jib sheet should not be re-trimmed in until the boat is "almost up to speed". If the jib is re-trimmed too early the time will be dramatically prolonged for the boat to get up to speed. If a crew has crash tacked and did not get the jib sheet off or for whatever reason couldn't get it off, then sail for a few seconds with the main overly eased and a bit fat (low).

This works well but not as well as a pre-eased jib.

The "crew first" technique allows the fastest tack but it also requires a fair degree of practice and that practice normally results in many swimming lessons. The "skipper first" method is the survival technique and the normal technique initially adopted.

Gybing, with Spinnaker

The key points:

1. The skipper must always look forward.

2. Gybe just after having accelerated in a gust or running down the face of a wave, as at this point the apparent wind will be at its least but most importantly the boat will have the greatest speed and therefore the helm will have the greatest amount of control.
3. Keep the 49er flat.
4. Be positive.

Again there are two techniques and again they can be designated by Crew first and Skipper first. The "Skipper first" is quite common as the skipper will often be sitting on the wing downwind.

Gybing Technique - Skipper First

1. The skipper moves in first, onto the wing or into the cockpit, whichever is the most comfortable to steer the boat through the gybe from. He/she must be able to move easily across the boat while steering. It is more important that the boat is steered through the gybe flat, than try to get onto the wire fast.
2. Once the skipper is ready then he/she calls the gybe, the crew moves off the wire and into the boat and at the same time should trim the spinnaker in about 500 mm (sometimes the skipper may take the spinnaker sheet and do this procedure).
3. While this is happening the skipper is pulling the helm towards themself and initiating the gybe.
4. The crew goes straight across the boat and sits on the new wing, well out, watching the spinnaker and waiting for it to back and fall onto the jib/rig.
5. During this procedure the skipper has pivoted in the middle of the boat and is sitting also on the new wing well out.
6. Once the spinnaker has backed, the crew releases the old sheet and starts pulling on the new one, the spinnaker will blow past the luff of the jib and fill on the new side and adopt its new setting.
7. While this is happening the skipper is trimming the main and ensuring that the battens have popped across to the new gybe.

(NB*1: This whole manoeuvre requires timing. Don't spend too much time setting up, as speed will be lost, and this will result in the boat being too loaded up to gybe safely. With speed maintained it is a smooth, easy manoeuvre. Without speed it is usually rather "wet".)

(NB*2: As the boat comes out of the gybe it often pays to bear away quite sharply, so as to neutralise the turning and heeling moments generated by the gybe. If this can be delayed until the spinnaker has collapsed into the jib, this bearaway has the tendency to lift the spinnaker off the jib and rig - this in turn makes its slide through to leeward toward its new setting much easier and faster.)

Gybing Technique - Crew First

The same rules apply as above:

1. The crew passes the spinnaker sheet to the skipper and moves into the boat.
2. The crew adopts a bent-over position with the old sheet in one hand and the new sheet in the other.
3. Skipper calls the gybe, and as this is done drops the main, pulls themselves upwards on the trapeze and pulls the helm towards themselves initiating the gybe.
4. As the boat starts to turn the crew trims in the old sheet about 500 mm and rocks his/her body to the new windward side ending up sitting on the wing a fair way out. The skipper stands up and runs straight across the boat, dropping the old tiller extension on the way and not picking up the new one until he/she is on the new side and facing the right way. (If in form, the skipper will also grab the mainsheet on the way through.)
5. Skipper moves straight out onto the wire while the crew waits for the spinnaker to start to collapse and fall into the jib/rig.
6. The crew then pulls in the new sheet and trims it for maximum speed before moving out onto the wire, grabbing the main on the way if the skipper missed it.

The same tricks apply to both techniques. Again the second system is much faster and often the skipper will swap places with the crew in light airs so as to be better able to execute it.

The same rules apply as with tacking as far as keeping the boat flat, except that in the gybe the boat can be heeled a little to leeward at the start of the turn. Also the apparent winds on the spinnaker/main are reversed so it pays to trim the spinnaker in and ease the main at the start of the turn.

Two-Sail Gybe Technique

This is the same as a spinnaker gybe but there is greater emphasis on the need for speed and it must be done flat, or not at all. Hitting the new wing without delay is essential. Once again, the skipper must gybe the boat under the crew, and fast.

In a good gybe the main will come over by itself, sometimes though even in a good gybe it needs some help and a friendly hand from the crew will ensure success.

Steer the boat quite square out of the gybe until crew has control of balance.

Again, as the boat comes out of the gybe, it often pays to "bear away" quite sharply so as to neutralise the turning and heeling moments generated by the gybe. This is even more important with a two-sail gybe!

Bearing Away at the Top Mark

A 49er has a large amount of sail and the technique of bearing away at the top mark is often referred to in skiff circles as the "twilight zone" - that is there

is a great deal of uncertainty as to the success of the manoeuvre and sure and certain skills are required.

First the reasons why it is a "twilight zone" (let us assume 20 knots plus).

- The boat speed coming into a top mark is probably 9-11 knots. The process of a well executed bear away will take 5-7 seconds at the end of which the 49er will be moving at double the entry speed, so the first problem is the rate of acceleration. It takes a bit of getting used to.
- The boat's ability to keep its bow up is proportional to hull speed so for a great proportion of the manoeuvre, the still slowly-moving hull will be resisting a larger force from the rig than is usual at that lower speed.
- Also the variation in apparent wind is working against the boat. As the skipper bears away, the apparent wind on the main will be moving aft faster than the boat will be turning. Also while the boat goes through the bear away manoeuvre the skipper will be moving from the upwind technique of feathering to the downwind technique of steering for balance.
- This swap over period (especially when two sail reaching) also has some skiffie speak and is termed the "mystery zone".

Firstly, on the beach, if the forecast is for fresh winds then tighten the cap shrouds another hole, one to two holes below standard is not a problem.

Secondly, boat speed makes life easier, so when coming in to the mark, crack off a couple of degrees and lift the hull's speed. Even an extra two knots will make a big difference.

Thirdly, dump the vang. Let it up a few inches in moderate conditions and flat water or dump it completely in fresh, lumpy seas so that the leech of the main opens as much as possible.

Do not ease the cunningham. Do that after you are away. Easing the cunningham prior to the bear away will only fatten up the main and make matters worse. As a side note dumping the vang will result in the head of the main twisting right off, and that can cause you to nose-dive or roll in to windward after the manoeuvre, so if the vang is too loose, bring it back on quickly once the new course has stabilised.

And of course, get right down to the back of the boat and make sure the boat is flat when you start the bear away, because if it is flat to start with there is a much better chance of it being flat (and upright) when you end it the turn. The crew should shuffle back on the wing to help keep the nose up prior to commencing the turn.

Provided there is sufficient speed up, don't slowly ease the boat away. It is best be very positive with the turn. The apparent wind speed will be dramatically altered and centrifugal force will be used during the bearaway to help overcome the additional heeling force.

In reality it is a very controlled, deliberate and coordinated but very fast manoeuvre.

While this manoeuvre is being executed, ease the main in a controlled manner which is coordinated exactly with the turn. Even with a sheet hand available on an Eighteen, most skippers tend to handle the sheet themselves as well as steering so that they can better coordinate the two controls during the turn. The jib must be released, and the crew needs to move both into the boat and aft and also control balance as the skipper will not be able to do so.

All the sails should be under-trimmed in a bear-away, and if the boat is initially slightly rolled to windward, this makes the turn easier. It is almost impossible to do it too fast. Do not overdo the manoeuvre as it is possible to crash into a gybe unless the steering is very positively controlled.

(NB: If, in powered up conditions, the boat is brought away in a slow arc, this will result in a massive and uncontrollable increase of force, which will more than likely result in heavy bow-down trim / nose diving, loss of control (steering) and will probably end up in a capsized.)

Once the boat is away, the crew can go into the boat, if it is for a spinnaker set, go straight into that procedure and the skipper will remain on wire and balance the boat.

Setting the Spinnaker

There are two types of set - windward and leeward. Most people try and rig the spinnaker for leeward sets because they tend to be simpler and smoother but there are benefits in windward sets and at some stage a windward set will need to be performed. A windward set is when the spinnaker will come out of the chute on the windward side of the forestay and leeward is the converse.

Windward Sets

The crew moves into the boat and starts the initial hoist by simply pulling on the halyard, the skipper stays out on the wing or on the wire and sails the boat flat bearing away all the time. He/she also calls the hoist, i.e. '1st spreader', '2nd spreader', '1 meter', '? meter', 'You're there!'. It does not matter what is called but it is a big help and a good discipline.

1. About the time the skipper calls '1st spreader', the boat should be squared away and running dead down wind and shortly thereafter the skipper will also be in the middle of the boat, it even helps to run by the lee at this stage.

What this does is help the spinnaker to blow away from the mast and especially the forestay area. If this can be done in one smooth arc, then as the turn slows, the spinnaker will, in effect be thrown away from the mast exactly as the head of the kite passes the hounds.

2. The skipper maintains this running dead square/by the lee attitude until the head of the spinnaker is about a meter from the tip.

At this point the skipper starts to round the boat back up to its "proper course". This will help to blow the spinnaker through to leeward. It will also require the skipper to move back out onto the wing and possibly the wire.

Once this process is mastered the skipper may even take the new sheet out with them as the boat rounds up and he/she moves out, and this will aid in the setting of the spinnaker and also aid the crew in getting the new sheet on faster, the rounding up process also exaggerates the apparent air flow across the newly setting spinnaker, again aiding in the setting/filling process.

3. As soon as the skipper calls, 'You're there!', or the crew knows the kite is at the top he/she moves to grab the new sheet and trims it in while moving out onto the wing.

(NB: It is far more important to get the spinnaker trimmed in than to jump on the wire as jumping onto the wire in most cases will only result in an aggravated round up and slowing of the skiff. If the crew moves onto the wing to balance, trims the kite on and gets it working, then moves out onto the trapeze, the boat will accelerate the fastest and achieve VMGs sooner.

It also happens to be the least strenuous and the more predictable option.

Leeward Sets

Very similar to the above.

1. The crew moves into the boat and starts the initial hoist by simply pulling on the halyard, the skipper stays out on the wing or on the wire and sails the boat flat bearing away all the time. He/she also calls the hoist - '1st spreader', '2nd spreader', '1 meter', '? meter', 'You're there!'.
2. The skipper stays out and maintains boat speed, this also helps maintain cross flow which keeps the spinnaker away from the mast. As the spinnaker continues up it will be necessary to continue to bearaway, but not to the same extent as with a windward set as the skipper (in 12 knots) would not come off the wire.
3. As the spinnaker reaches the tip, the crew rapidly moves out onto the wing with the new sheet and the spinnaker should pop!

This can happen much faster than in a windward set because the skipper tends not to come off the wire, therefore the boat tends to be moving faster and the crew are able to control the boat better due to the speed and weight.

4. As soon as the skipper calls, 'You're there!', or the crew knows the kite is at the top he/she moves to grab the new sheet and trims it in while moving out onto the wing.

Same rule applies, set the spinnaker first then get the crew out, with the skipper still on the wire the boat will move very quickly to high VMGs.

A Gybe Set

Gybe sets allow the two functions to be combined and are a very potent tactical manoeuvre.

The start is the same as the windward set but the bearaway process is continued into a gybe, and with the right timing the crew gets the spinnaker to the top of the mast as the boom comes across and takes the new sheet (leeward after the gybe) out with them as he/she moves out onto the wing and wire. This is one case where it pays for the crew to move straight onto the wire as they will be able to do it much faster than the skipper.

The combination of the spinnaker being blown well away from the mast and the high cross wind component of the apparent wind mean the hoists are very fast and the filling of the kite is almost immediate. The unexpected nature of the manoeuvre also can leave your competitor in a mess!

Dropping the Spinnaker

Again there are windward, leeward and gybe drop options, with the gybe drop always the fastest, the windward drop the safest but the leeward drop the cleanest.

The technique for a windward drop is:

1. Skipper is on the wire or moves out onto the wire and once settled takes the spinnaker sheet from the crew.
2. The crew moves off the wire, into the boat and takes the slack out of the retrieving line.
3. Then the crew reaches in and releases the halyard. This is the signal for the skipper to let go of the spin. sheet and the crew then rapidly pulls in the retrieving line.
4. The crew should pull very quickly and the skipper should momentarily (1-3 secs) bearaway, quite sharply but possibly not even come off the wire. If this manoeuvre is done correctly the core of the spinnaker will pop on the windward side of the forestay, if it does not then the process is slower.
(NB: Once the pull patches are together even on the leeward side of the forestay (but against it) the kite will not "prawn", i.e. fill with water, and other adjustments can be made, such as, get the centreboard down or move out on to the wing, provided the tension is not released on the retrieving line.)
5. Then simply pull the kite into the sock.

In the case of a leeward drop, it is exactly the same operation except that the spinnaker is safe once the 3 patches are hard against the spinnaker throat.

The bearaway manoeuvre outlined in 4. will dramatically reduce the effort required to start the patches into the throat and once they have entered the chute it becomes exponentially easier with every cm away. This can also be enhanced by running square but tends not to be necessary.

Gybe Drops

Gybe drops come from the Eighteen days with hand drops rather than spinnaker chutes but an adaptation of those processes can again be used tactically and to help with a difficult mark rounding. There are two types of gybing: a windward drop and a leeward drop. Gybing to a leeward drop is a bit pointless as you will in fact gybe the spinnaker to drop at some stage so there is little or no benefit, but gybing to a windward drop is very safe and very fast and you have the added advantage of gybing with speed which as stated before is the key.

So the Gybe (to windward) drop is as follows:

1. The crew passes the spinnaker sheet to the skipper and moves into the boat.
2. The crew adopts a bent-over position with the old sheet in one hand and the new sheet in the other.
3. Skipper calls the gybe, and as this is done drops the main, pulls themselves upwards on the trapeze and pulls the helm towards themselves, initiating the gybe.
4. Pull on the old sheet until it is very tight.
5. Once the boat has gybed and the spinnaker has blown onto the rig, while still hanging onto the old spin sheet with one hand release the halyard. This will allow the top of the spinnaker to blow around to leeward of the jib and simply hang.
6. Quickly grab the retrieving line and pull very fast, and then the spinnaker will fall in a bunch on the windward side of the jib, as a mass and then be very easily and quickly sucked down the chute.

The big thing about this style is that the gybe is controlled with plenty of speed and there is no need to pull the spinnaker around to the weather side of the forestay. Also the spinnaker falls right on top of the throat making it very available and easy to be sucked away.

Rounding onto the Wind

Ensure the crew weight is properly balanced. The skipper should already be on the wire, the crew poised to get move. (If there is sufficient breeze or pressure, the crew would also already be on wire.)

As the mark rounding approaches, if possible, come away slightly to bring the boat over to windward, then steer it up onto the breeze. This will enable the main to be brought on early. Keep the boat flat in the turn.

If the approach is too shy for this, try and ease the boat over to windward, by easing the sheet.

Keep the jib well eased in the turn, then sheet on hard once the boat is on the breeze. With the boat spinning around the centreboard there will be a high cross wind component of the jib and the main will be backed.

If the boat is not flat before the turn, the heel will become exaggerated as the rig throws its centrifugal force out into the turn, and will not allow the main to be sheeted on until the boat is on the breeze. By that stage the crew will be very wet as the boat will have rolled in to windward. Communication from the skipper and crew is paramount.

Again the skipper needs to keep the windward chine in and steer around gusts and lulls.

Troubleshooting

Spinnaker Hard to Pull Up

The first area to look at is the top block and the run of the wire main halyard, the wire should run along side the spin. halyard block and not over the top of it. This can easily be done by taking the cap shroud T balls out and looking through the opening to see where it is. If it is over the spin. halyard block then you need to slacken the main halyard and persuade it over to one side or the other. This may take some fiddling and bending of the wire to get it past the rivets but the up side is once it is there it won't come back. Then put the T balls back in.

With respect to the run of the wires, it is possible to get them twisted. The easiest way to fix that is to:

- Pull the spin halyard right out of the mast;
- Pull all the other lines very tight;
- Elevate the tip of the mast 4-5 m (stand on a roof or balcony), with it laid on its side;
- Use a hose and allow the water to run down inside the mast at the fastest rate you can (you may need to take off the base plug); and then
- Feed the halyard in from the top. The water will pull the rope down and it will also ensure that the rope does not twist around anything else due to gravity.

With respect to the exit hole for the halyard at the bottom, while doing the above file it clear if there is any friction at all to the run of the rope.

With respect to the bend of the mast and friction inside, once the halyard is

clear then there should not be very much. To minimise it further then use a 16 (or 24 is better) braid line, such as Vectran, for very low friction. Keep the size under 5mm dia.

If the block at the top of the mast is worn then use an RF 1985 HL or Harken 302 and it can also help to use a guide saddle right below the block to ensure that the rope always runs straight onto the sheave.

Also while the base plug is off, look at the block in the bottom and ensure it is up to speed, if it is damaged then try replacing it with a block of a bigger diameter sheave and high load bearings, such as an RF 1017HL or Harken 306 or 106 (the 306 is better). Just for comparison Eighteens use a 302 at the top and a 310 at the bottom.

Spinnaker is hard to set and drop

Buy a can of McLube or another good silicon spray and be very liberal around the throat, sock and the spinnaker itself. Thread a small, 20mm dia. ball onto the spinnaker retrieval line between the first and second retrieval patches on the spinnaker so that the last/top pull point is separated from the middle one by 200-300 mm, by tying a second knot. Use a reverse 1:2 purchase on the spinnaker pole extension system, if it is not already being used as this has become very common and almost standard. That is, where the rope comes around the front deck block just in front of the throat, run it through the strap on the back of a block and secure it to the throat by drilling a hole or using the one that is there. This block should also be a high load block, with some 49er owners using wire sheaved blocks. The friction around the strap on the back of the block is needed to make the whole thing work.

What this will do is to slow the launch of the spinnaker foot and allow the head to move further up the mast before the rest of the kite comes out and causes a problem. The plastic balls and separating the pull points further enhances this by keeping the two bodies of the spinnaker apart in the chute.