Tuning Your Sloop Sails
by Graham McAllister

This article is an introduction to tuning a sloop rig and was originally written for the rig as fitted to the Kittiwake kits. The method is equally applicable to any sloop rig. These are my personal thoughts on the subject based on my experience with footys and larger R/C yachts. They work for me and I hope they will work for you.

Initial set up
When you first complete your yacht there are some base adjustments you should make in preparation for your first outing to the pond. The kit instructions will have dealt with the setup of the servo arm. The servo arm should be able to pull the main boom from 90 degrees to the centre line of the deck (fully out) into a position at 10-15 degrees from the centre line (close hauled). That is usually just inboard of the rear corner of the deck. Remember you only have to be concerned with controlling the boom over one side of the boat because the wind will switch the booms and sails from one side to the other. The jib boom should be set about 3-5 degrees further out than the main boom when the booms (and sails) are pulled in (close hauled).

On the Jib
The forestay, the line running through the pocket in the front of the jib sail, should be set quite tight but not so tight as to bend the mast forward (larger yachts have a backstay to counteract this). The line attached to the top corner of the jib sail should be just tight enough to hold the front sail edge straight. The line at the back edge of the jib sail that goes from the mast top to the rear edge of the jib boom (topping lift) should be just taut. The bottom (foot) of the jib sail should have the adjustable line to the boom at the rear corner (outhaul) positioned on the boom so that there is a curve in the sail foot. This curve should be about 1/2" at the middle (Footy-sized yacht).

On the mainsail
The tie at the top front edge of the sail should be just taut to keep the front edge of the sail straight. The bottom (foot) of the main sail should have the adjustable line to the boom at the rear corner (outhaul) positioned on the boom so that there is a curve in the sail foot. This curve should be about 3/4" at the middle (Footy-sized yacht).

The kicking strap or vang
This is the adjuster between the main boom and the bottom of the mast. Initially set this so that the boom can lift a little from its natural position. This allows the main sail to twist a little towards the top. You will be able to see this if you hold the boat in your hand in a wind or blow against the sail. Ideally the twist in the main sail should be echoed by the twist in the jib sail.

These positions will give you a good basic trim on the sloop rig ready for your first outing. Choose a day with a steady light wind of 5-8mph. I don't expect you to be able to tell what that feels like. I still can't! So just pick a light wind day and preferably a pond where the wind is not too disturbed by trees, etc., because a confused wind will confuse us, and the yacht.

Static jib balance
When on the run downwind with a sloop rig, we want the jib to swing to the opposite side of the boat to the mainsail. To help ensure that this happens I will add a little weight to the front of the jib boom. My personal preference is to add enough weight to slightly over-balance the jib. In other words, if you hold the boat in a heeling position the jib will swing 'up hill' as it were. The weighted nose of the jib boom will swing downwards.

On the water, turning downwind, the boat will tend to heel down at the side to which the mainsail swings. Having the jib a little over-balanced will cause it to pop out the other way. This assumes that the jib can swing freely; not too much tension on the jib pivot.

Your first adventure
At the pond, turn the radio control transmitter on first and then the receiver. Pull the sail control stick back (down) which will pull the sails all the way in. Stand at the pond side with the breeze in your face and hold your yacht by the keel straight out in front of you. You will see that the sails are both just flapping gently, shaking.

Start to turn the bow of the boat towards the right and notice that the wind starts to fill the sails, pulling the booms against the control lines. You will start to feel the force of the sails trying to roll the boat over in your hand. Now let the sails out further with the left hand transmitter stick. The sails will go slack again, but if you turn the bow more to the right, away from the wind, you will feel the sails start to work again. Now try the other side until you have the sails all the way out (transmitter stick away from you or up). With the sails all the way out, you need to turn the yacht to have the bow pointing towards you before the sails are working again.

This will give you an idea of how the sail position (in or out) needs to be changed to sail the yacht in different directions as compared to the wind. You will discover that when actually on the water the yacht will not have sail drive for about 45 degrees either side of dead into the wind. This is normal.

Now place your yacht on the water with the sails close hauled (in). Point it at about 45 degrees to one side of the wind and give it a push. Your yacht should sail away from you quite nicely. As you turn the rudder try to discover how to adjust the sails to maintain drive. The rudder is typically used to initiate a turn then released. Sail position has a lot to do with the direction in which you are sailing and you will discover that sail position has a steering effect, too. Next I will discuss what you see the boat doing on the water and how to affect it by tuning the sails.

Reading the signs

Your first visits to the pond with the sails set as above will teach you a lot about how much fun a radio control yacht is and the basics of keeping your sloop rigged yacht moving with best sail position. Now it is time to take a look at what your boat is telling you and how to interpret that and develop better sail trim.

Position yourself facing into a steady breeze again (not strong) and set your yacht sailing on a port tack (that is at 45 degrees or so to the right side of the wind) with the sails hauled in and the rudder set straight. Watch your boat carefully.

If it sails along steadily with the bow occasionally turning a little into the wind (luffing) then falling off and continuing on its way then that is exactly what you are looking for. Turn the boat through the wind on to the opposite tack, that is with the bow at about 45 degrees to the left of the wind (starboard tack). Does your boat behave the same? If the answer is yes then we can consider that your boat is well balanced with a small degree of ‘weather helm’. Weather helm means that the boat turns into the wind in response to a slight increase in wind speed like a gust. This is good.

Problem solving

If your yacht behaves differently and assuming you are sailing in a steady wind which is not too strong for the size of the sails, here are some descriptions of behaviour and how you can try to correct it.

Your yacht sails properly (as described above) on one tack but not the other.
Check that the rudder is central and is centering correctly after each turn command. Check that the sail control lines (sheets) allow the sails to move an equal angle each side of the centre line of the hull. Check that the keel fin is straight!

Your yacht turns hard into the wind (luffs), sails shaking and stops or loses speed on both tacks.
Loosen the kicking strap a little on the main boom to allow the boom to lift a little more and the top of the mainsail to twist away from the wind. Look from the rear edge of the sail to see this. If you have a bowsprit fitted, move the jib pivot point forward a little to move the jib forward. Move the main sail outhaul out a little on the boom to flatten and de-power the main sail. Try one thing at a time.

Your yacht turns away from the wind (lee helm) and needs rudder input to hold the course.
Tighten the kicking strap on the main boom to reduce twist in the main sail. Move the jib back to just clear the mast as it swings through. Tighten the line at the rear edge of the jib (topping lift) to put some twist in the jib and de-power it. Move the jib sail outhaul out a little on the boom to flatten and de-power the jib. Try one thing at a time. If you are experimenting with different sails on your yacht then your jib may be too large in area compared to the main sail.

Some thoughts about wind strength
As wind strength varies, even a well-trimmed yacht will start to behave differently. Strong gusts will cause the boat to luff harder and might drive an otherwise well-trimmed boat too far into the wind (into irons) with the sails shaking. This is where a quick and firm application of rudder will keep you out of trouble and keep the yacht moving on the tack. In these conditions it is wise to ease the sails out a little and sail a wider tack a little further off the wind. Racing skippers will tell you that it is better to sail a little longer distance at speed than to try to sail the shortest distance to the buoy slowly. If you are just sailing for fun or between heats in a race you should bring the boat ashore and make trim changes to suit the stronger or lighter wind. Light winds will often have the effect of making your yacht show lee helm. Use the ideas above to correct this effect.

Fair winds,
Graham