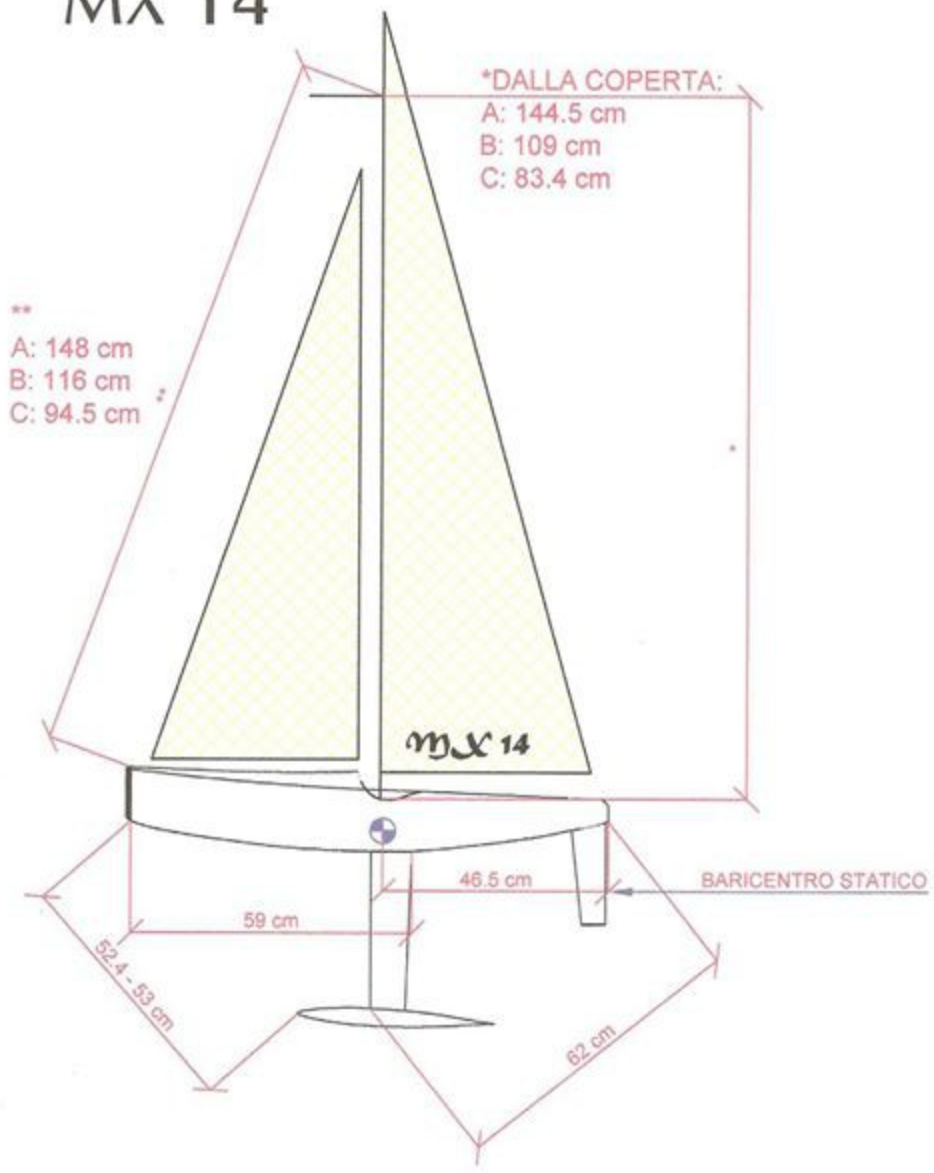
MX 14



TUTTE LE MISURE SONO SENZA GOMMINO

MX COMPONENTS

Basic measurements:

I build my masts starting at the top so all measurements are taken from the inside of the top mast band:

Pre bend 11mm 7075 T-9

A: 10-12mm
B: 5-6mm
C: 0mm

Pre bend is measured in this case by laying the back of the straight lower mast against the straight edge of a bench or rule and measuring the amount the top curved part of the mast is forward at the top band.

Mast pre bend starts about 600mm from the top band. The mast above jib point is also straight.

Mast Bands:

Middle band:	Bottom band:
A: 221 mm	1599 mm
B: 161 mm	1179 mm
C: 121 mm	879 mm

Jib stay attachment point 6mm below bottom of middle band

Side stays attachment point:

A: 450mm
B: 340mm
C: 345mm

Measured down from the bottom of the top band. Stays can be attached to the side of the mast but best practice now is to fit small SS needle syringe tube to the end of the mono wire and make hooks. These are hooked into a hole in the front of the mast with a circle of sail tape over. They can then be removed or easily replaced if broken.

Spreaders:

Below top band:	Spreader Length:
A: 1025mm	52 mm
B: 760 mm	48 mm
C: None	

Spreaders are approx 50% of the distance between the side stay attachment point and the top of the bottom band. I use clip on spreaders so I can easily move them and swap them for longer or shorter spreaders.

Top of Lower band to deck mark on all rigs: 70mm (for 50mm body Bantock G/N)

Tuning Notes: .

Basic concept is to separate the fore and aft and the sideways tuning. On big boats you are on the boat and can see any effect of spreader angle and stay tensions on mast bend. Trying to do this on an RC yacht leads to madness.

Sideways tuning:

Adjust the side stays so they are the same length. Then adjust tension until they are firm and the mast is straight sideways on either tack with no load.

Stay tension can reduced in light air to soften up the rig. With adjustable spreaders you can try different lengths easily and decide the correct length to de power the rigs.

Fore and aft tuning:

This is basically about sail shape and fore stay tension.

Jib shape:

You have little control over jib shape other than foot curve (which effects the bottom third of the sail only) and jib twist (leach line). However the fore stay and leach line tension are provided by the back stay and ram. You need a tight fore stay most of the time but you can reduce tension in light air to add some fore stay sag and add some shape.

Mainsail shape

The most important adjustments on mainsail shape are mast ram, back stay and vang. These three need to be adjusted together to provide the range of sails shapes needed and also to provide the right amount of fore stay tension. Foot curve effects only the bottom third of the sail.

If your main is back winding, you are either sheeting too close, have insufficient twist in the jib or you main is too full down low. Use more back stay and less mast ram to flatten the main and have a straighter entry.

In medium A rig conditions 5-8 knots settings set the rig up close hauled with main and ram tension sufficient to produce an even curve in the mast and medium sail shape. You need to balance the back stay and ram to do this. The main shape should be a dish with the maximum draught slight fore ward of middle . Check fore stay tension it should not feel loose. Apply enough vang to have a nice twist a nice open leach. View the boat from behind the leach of the main should be slightly open at the top. I hold the boat on its side standing and view the rig from the direction of the wind. So I can see the shape of both main and jib twist. I swap the boat from tack to tack to make sure that the sail set is the same on both tacks. Set the jib twist with the lower 2/3 of the leech at least parallel with the mast and slightly open at the top.

In light air use less back stay and less vang to fill the shape in the mainsail. The mast will then usually be straight. The fore stay tension will come off too making the sail sag more and slightly fuller. The tension will come off the jib swivel so the sail goes out easier. You can also take a little off the side stay tension. Unwind each side a half a turn or so. The side stays should still be firm but not slack. The jib sheet can be eased 5mm in drift conditions to open the slot and maintain balance.

In stronger winds. Pull on more back stay until the top of the main collapses. Add more mast ram and luff tension and repeat, until you can go no further. The mainsail then should be a flat curved smooth shape. Adjust vang for slightly more twist. Adjust jib twist to match. Fore stay will be tight.

Balance and mast rake:

Balance is everything on an IOM. The boat must be set up so there so no weather helm at all. The boat when correctly set up will sail it self on all points of sailing it will only gain some weather helm when it heels enough for the rig to leverage the boat to windward.

Vary mast rake to find the correct balance.

The B needs more rake than the A and the B sails need a little more twist in main and jib. The C rig needs more rake than the B and the main needs to have less twist in order to maintain balance.

Foot Curves:

These don't vary much from boat to boat. Measure by pushing the rule into the foot until the rule stops.

A Rig: Main 25mm light air or waves 30 mm	Jib +5mm
B Rig: Main 25mm Waves 30mm	Jib +5mm
C Rig Main 20mm	Jib + 5mm

Sheeting Angles:

Mainsail 10mm off the centreline. Aim the jib boom about 10mm inside the side stay. This is your starting position. The best way to set the main jib angle is to sail the boat to windward and to luff. Both sails should break at the same time.

In drift conditions open the jib sheet slightly say 5mm to open the slot.

If you main is back winding, you are either sheeting too close, have insufficient twist in the jib or you main is too full down low.

Main luff wire or tape?

I prefer to use luff tape. The only advantage in a wire is you can get away with less luff ties as the luff is a bit firmer. **The luff wire should never be tight.** The idea of using luff ties or rings is to allow the mainsail to rotate around the mast. It is in effect a rotating mast where the sail rotates but the mast doesn't rotate. Rotating masts are very hard to control in any case and are not allowed on the IOM. The luff wire should be set when the sails are all the way out and set to limit the luff sag.

Luff tension should be set up so that it automatically eases when the mainsail goes out. This allows the main to rotate around the mast on a reach or run. The reduced luff tension increases fullness and power.

Luff Tension:

Always only use enough to remove wrinkles in the luff. A slight sag in the bottom of the main luff is okay as the luff tension increases as you go up the mast. You need the middle part of the sail to be right. This sometimes means the bottom of the main luff is a bit low in tension. Jib luff tension the same, just enough to remove wrinkles. Most sailors use far too much luff tension.

Jib Balance weight:

Balance the jib with the CG of the jib and boom on the swivel. You do not want to be steering the boat around trying to get the jib out. The jib should go out on it's own. If the jib won't go out on a run you either need to come up a few degrees to a reach or you need to gybe. Always keep the jib full and drawing.

FRD April 2015