

Voyager modifications:

By the numbers...

1) Boat stand: replace the straps with something more substantial, mine came apart after a few weeks...

I used straps, left over from an old rucksack, sewed the loops as the stock ones and assembled the stand, adding a drop of glue (white woodglue) for more rigidity.

2) Rudder and keel assembly: if the lead bulb came out of the same form as mine, it's only remotely "torpedo" shaped.

As this was first ever sailboat, I had no idea and glued it onto the fin, as per instructions.

After meeting other boaters (with their boats), I realised the shape was creating more drag than was necessary and I hammered it into shape, severely hindered by the fact, that the fin had already been glued on.

I suggest you shape your bulb prior to gluing it onto the fin.

As lead is very soft (and toxic! wear gloves!), you can hammer it into the shape you want, I sat in the sun, with a cloth on my knees and rested the bulb on my lap, mildly tapping it into a more streamlined shape.

Make sure not to bang the slit for the fin out of shape, concentrate on rounding the sharp edges on the front and the rear.

I'll provide pics with every step, if needed.

Only use 5 min. epoxy if you're in a hurry, or experienced in working fast. I did, and nearly couldn't get the pin in place, as the epoxy started to cure, before I was done... The 30 minutes epoxy works much more relaxed.

Make sure the pin fits, before mixing the glue.

I wanted to keep the keel fin removable, so I did not glue it into the hull, it makes transport a lot easier.

Make sure that the setscrew is in place on the rudder control-arm and make sure the arm fits on the shaft, before putting the rudder in its place.

I made a black spot (mark pen) on the rudder shaft, put it in place, wriggled the arm in position and marked the spot by gently turning the set screw on the shaft.

Remove the screw and shaft and file a flat spot on it where the set screw will come, you'll never have issues with a rudder shaft getting loose, lost, or out of sync with the servo...

3) Servo installation: I have no idea what kind of servo's the MRP people had in mind, designing the servo trays, but fact is, no standard servo that I could find, fits.

I made new fitting plates out of ABS sheet and glued them over the existing tray for the rudder servo. Drill a few holes in the bottom corners of the tray, so water will run into the bilge, instead of corroding your servo electronics.

As a sail servo I initially used a GWS SO6/2BBMG, because it was the strongest (7 Kg) metal geared servo in standard size I could find, but after a sail change (larger) I took a GWS IQ-900BB (13Kg) quarter scale servo which required some surgery and yet another servo-plate.

I cut out the rear and sides of the existing tray, to make the larger servo fit.

DO NOT cut out the front of the tray, it's the rear of the keel slot and you might spring a leak (don't ask...).

The stock sail-arm looks rather flimsy, but does the job.

I broke mine when I slipped, and the boat flew out of my hand and landed on it's nose in the mud (as did I, but on my back...).

I replaced it with one made out of 1mm carbon-fibre sheet.

I have the rudder rod in the middle hole on the servo and in the outside hole on the rudder shaft, giving me 30-35 degrees of rudder throw to both sides, more would act like a brake, as the current would brake off the rudder.

4) Receiver and Battery installation: I never used the balloons; they are never 100% watertight and I'd most likely forget to take the receiver out one time too many and end up with a receiver with moisture damage.

Instead I mounted the receiver with Velcro on a pedestal, which sits in the receiver tray (holes drilled in the corners) keeping the receiver high and dry, even when there's water in the bilge.

I use soldered five cell receiver-packs, which I 'Velcro' next to the sail servo. The tray I only use for my spare 4 cell receiver-pack, in the rare cases I sail for more than five hours at a time.

For smooth operation I've bolted a small block on the main sheet side of the sail-arm.

I didn't fancy the idea of the main and jib sheets running through simple holes in the ABS deck, so I made two fairleads; one for the main, a brass M4 bolt with a 2 mm hole drilled through it, with rounded and polished edges and a curved one (pointing towards the rear under deck, made out of brass washers and tubing. The jib fairlead sticks out some 12mm preventing water from the deck running in.

I glued all ABS fittings with Ethyl-Acetate (chemist) it's a solvent that welds the ABS parts together solid. (Methyl Ethyl Keton; MEK will do the job too)

I lift the boat in and out of the water by the mast, held in place by shrouds on only four small ABS parts, welded onto the deck, so yes, that's strong enough.

Only for the fittings on the carbon mast and beams I used CA.

Well, after three years of 'abuse' I finally managed to rip the chainplate, holding the jib-swivel point cleanly off the deck during an afternoon sailing in very gusty weather.

The plastic nudge, positioning it in the deck was sheared off and it had take some of the white ABS from the deck with it, so the welding with Ethyl-Acetate certainly works.

I made a new chainplate out of an inverted T-shaped plastic profile whith a 'welding' surface roughly ten times the old one and welded it in place, using Ethyl-Acetate, I taped it in position and put some weight on it over night.

That should hold for the rest of the boat's working life...

5) Hull assembly: I omitted the winch directly behind the mast, as it would be in the way of the modified pivot-point, I shut the hole with a goo, made out of scrap ABS, solved in Ethyl-Acetate (or MEK).

I use a 35mm plastic film container to mix the goo, as the solvent evaporates rather quickly and the film container is airtight (up to a point).

As mentioned above, I "welded" the other fittings in place with Ethyl-Acetate.

Hatch: I used all six hatch covering retainers and fixed them in place with M3 bolts and (self-locking) nuts and washers, the self-tapping screws have a tendency to disappear after being turned a couple of times...

The foam supplied with the kit is not sufficient to prevent the hatch from leaking (badly, as it turned out).

I glued the foam strips on top of the ridge, instead of in the 'gutter' around the opening.

On the inside of the hatch, I glued a 10mm wide closed cell foam strip to make sure the 'foam on foam' provided a watertight seal.

The only points where water can enter the hull are the fairlead for the jib sheet, the hole for the mast and the hole for the flagpole, which I also omitted, to avoid losing it to a fellow boater cutting across my stern in a regatta.

I only have a few drops in the boat after hours of sailing, only conditions in which a normal person would stay indoors (6-7 Bft), will

force a bit of water through the holes I mentioned, when Voyager dips her nose in the water and lifts her stern when running downwind, almost on the plane so fast, that walking very quickly is the only way to keep up.

If the wind gets too strong, and I'm too slow to react, she broaches and buries the hull in the water beyond the mast at full speed, very spectacular and very frightening if you see it happen for the first few times.

6) Boom and mast assembly.

I still use the stock main boom and the mast, but have replaced the jib boom for a longer one out of 6mm carbon fibre tubing when I replaced the jib with a slightly larger one, resulting in a no longer fitting stock jib boom.

(I also have a new 6mm carbon main boom ready, but wait till I'm in the mood to make a new set of sails)

As I had planned to divert from the manual in how to attach the main sail, I also did not use the retaining ring (# 22), but soldered a first attempt for a pivot point/boomvang, looked good, but was too weak and broke in high winds.

I kept the 4mm socket and ball concept for a simpler and stronger version that lasted for 6-7 months, before it was replaced by the massive brass version I showed on the forum (and in the pictures).

Mast: as the carbon parts are rather flexible, it's crucial to glue both parts together (preferably with epoxy) and apply extra lines in the rigging to keep it as rigid as possible, as far as bending sideways is concerned.

This is why I used the diamond rigging, shown in the picture (ignore the grumpy looking man...)

As I had heard horror stories about the stays being worn by the movements of the mast and spreaders (resulting in the mast snapping like a carrot...), I tensioned the rigging rather high (pling!), and

Thursday, November 8, 2007

fixated the wires on the spreaders with yarn and a drop of CA. Nothing slides, so no wear.

I use the flexibility of the mast forward and backward, to change the mast-bend and rake, to affect sail-shape and wind conditions.

In stock form, the mast top bends backward under the pressure of the jib-stay, causing the main to sag a bit.

I added a mast top stay to compensate.

In order to attach this stay on the bow, I modified a spare winch (the one I did not use at the mast), so it's an eyelet and attached a loop of string, to attach the clip from the stay.

The slider is on the mast top end (for easy adjustment when the boat is in the water)

Spreader: the Chinese craftsmen have a peculiar idea about alignment, the holes for my spreaders were not very aligned at all. I had to do a bit of careful bending, to make the spreaders align before I glued them in position on the mast.

Main boom/ boom-vang.

De-burr all parts and pre-fit prior to CA-ing them in place, use small amounts of CA, once in place, let a little CA run into the seams.

Take care not to glue your fingers onto the boom (mine has a partly fingerprint on it, as the glue did set quicker on my skin as on the ABS...)

I had already glued all chain plates on the boom, when I discovered, the boom-vang was too close to the mast to be effective.

Fortunately there's a spare in the kit, I drilled a fitting hole in the boom and glued the single hole chain-plate on the boom, about 185 mm from the mast (measured with the modified pivot point in position).

Thursday, November 8, 2007

I got a clevis from the LHS, and a M2 threaded rod, used as a steering rod on servo's.

The clevis was a bit too big, so I sanded it smaller until it would fit in the chain-plate hole and the rod could point towards the lower ball and socket pivot point on the mast.

I hope the pictures make it clear, if not, let me know.

7) Mainsail:

As I didn't want to pull the main sail over the mast I did it this way:

I pulled a line through the sleeve, that was supposed to go over the mast, burned a number of equally divided holes, close to the front edge, in the sail (6 to be exact), with a pointy hot object (I used my small electronics soldering iron, but a hot needle will work as well). With six loops of wire I tied the main to the mast, make the loops loosely, so the sail can move easily round the mast. The loops run around the mast and around the line in the sleeve.

Use the eyelets to tie the main to the mast top and main boom with a piece of string.

The line was stretched from the mastcrane down to the main boom and tightened just enough to stretch the sail along the mast, do not overtighten it.

I made the outhaul adjustable with a slider, made out of the plastic, where the parts are attached to in their bags.

This lets you adjust the curve in the main to the windconditions.

Jib pivot point:

When I replaced the stock jib boom with a piece of 6mm carbon tube (346mm long), to suit my bigger jib, I also glued the spare chain-plate (or one from the old jib boom) on the fore deck, drilling a second hole 20 mm behind the stock one, towards the mast.

Thursday, November 8, 2007

This enables me to slide the pivot point on the job boom further back, allowing for more set-up liberties.

Using the stock sails other than as a template for new ones is not a good idea.

The material stretches like mad, under the influence cold ambient temperatures as well as under the stress of the wind, they bag and sag completely out of shape and cannot be set properly.

When it gets warmer, the heat makes the sails shrink up to the point where you can see the rig starting to try and pull the chainplates out of the deck, bending the booms and mast like mad.

Please visit a kite-shop and get a piece of non stretching material for a new suit of sails.

As if I haven't numbed you with enough information; go to www.sailsetc.com , the site of Graham Bantock, one of the 'semi gods' of model sailing and download the Sail-making Notes (Technical information TI20).

I found these notes very helpful, making my first sails, when I was drowning in the flood of sail-making information, that's available on the internet.

These notes give you the right amount of information to enable you to fabricate your own sails.

Even in this compressed form you're most likely to be swamped, don't panic and ignore everything that doesn't directly relate to the making of non-panelled sails.

Read the rest and let it sink in.

When you start making your first set, information from these notes will seep through, and you'll get the hang of it.

If you don't want to use kite material, see if you can get your hands on Mylar drafting film, this is widely used for making sails, panelled as well as non-panelled.

Thursday, November 8, 2007

The company I work, uses this kind of film in a thicker version, I used that to make my first set, very heavy, compared to what I should have used, but they worked, unbelievably better than the stock sails!

Later I got a sample from our supplier which was much thinner, this worked like a charm.

Only the fact that this film is transparent, kept me from using it today. Sails from this material, left untreated in some way, are 'invisible' within ten meters and you can't tell how the sails are set and how the boat behaves...

My current sailset is made out of Spinnaker and has three panels each.

Jan Spoelstra

13-07-2007.

P.S. The photos referred to are available. Just send me a pm or an e-mail. My user name is pompebled