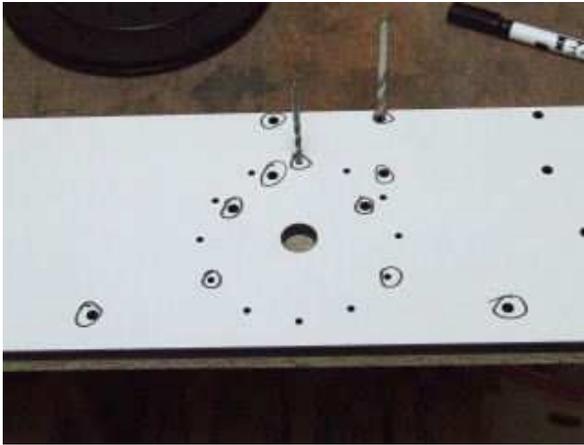
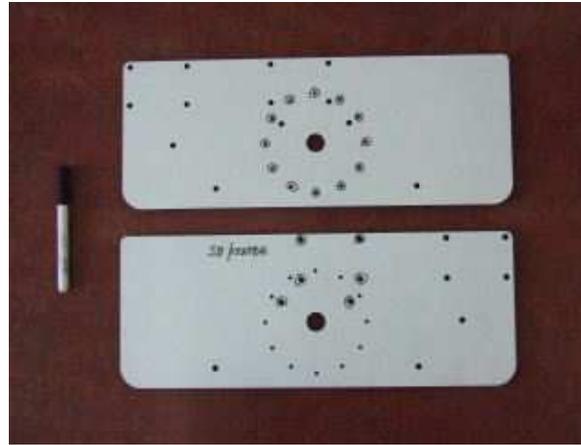


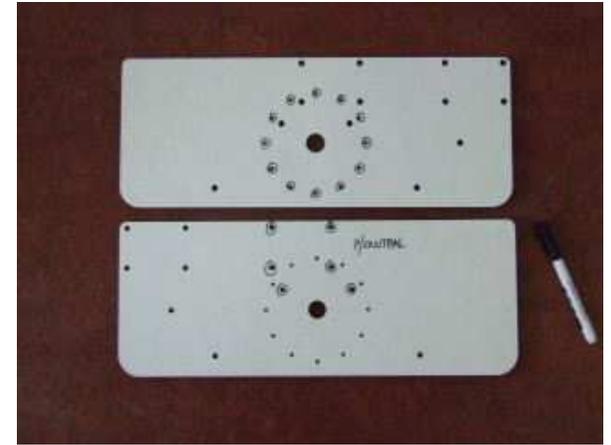
# Assembly manual



096.1 Make a copy of the vanebase using 10 mm particle board or plywood (450x174 mm) Drill the holes with 4 and 6 mm drill that are marked in the picture (with off centre mast drill the 4 holes for the mast bracket in the off centre position)

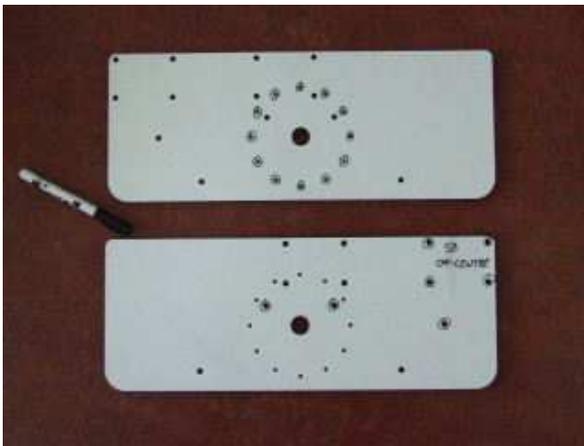


096.2 The vane mast is mounted about 20 mm off centre. This is referred to as the central position. Choose the position you want to mount the vane mast. The pictures in this manual show a starboard mounting.



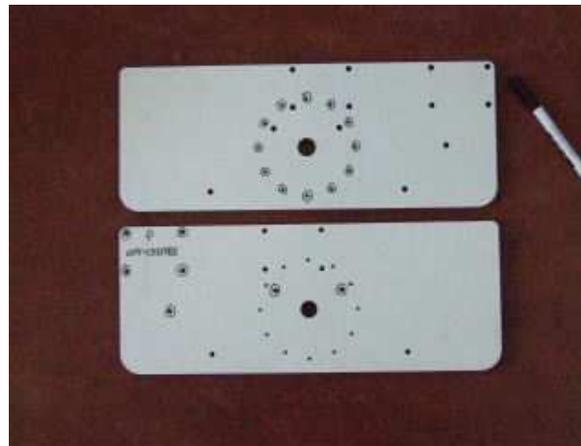
096.3 Central mast, port side: Mark both sides of your vanebase like this using a whiteboard marker

Central mast, starbord side: Mark both sides of your vanebase like this using a whiteboard marker



096.4 Off centre mast (THIS REQUIRES THE OPTIONAL OFF CENTRE KIT), starbord side: Mark both sides of your vanebase like this using a whiteboard marker.

If you have no technical reason to decide which side to mount the vane mast, choose like this: If you often have to sail south and the prevailing winds are south west then mount the vane mast to starbord...



096.5 ...This way the wind vane has the least interference from the mainsail.

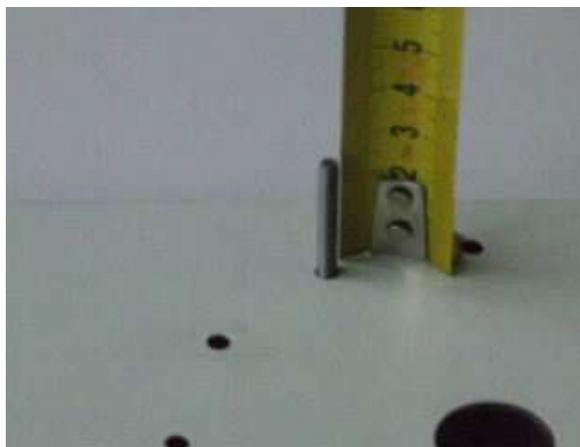
Off centre mast, port side: Mark both sides of your vanebase like this using a whiteboard marker



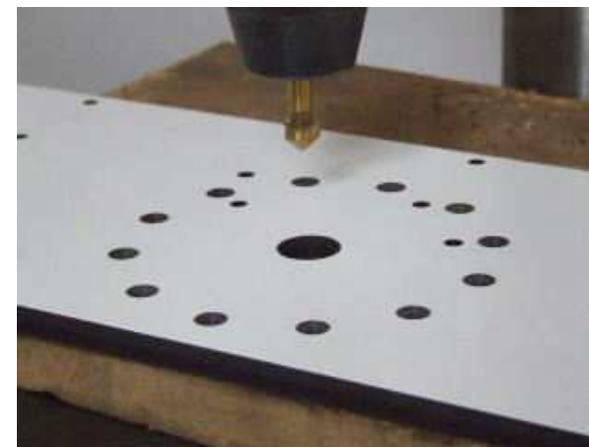
096.6 Counter sink the first hole (any one) of the circle of 12...



096.7 ... carefully checking that the head of the m4 screw becomes flush with the surface of the vane base



096.8 Measure the length of the screw on the other side of the vane base and counter sink as often as necessary to achieve a length of 25 mm- 25.5 mm, no more, no less



096.9 Set the depth gauge of the bench drill or drill stand and repeat with the remaining 11 holes

Note: often the counter sinking is less deep after setting the depth gauge. Check if this is the case!



096.11 Turn over the vane base and repeat the process for the 6 mm holes you also marked previously.

Here the heads only need to be flush with the surface of the vanebase. The depth gauge needs to be reset to achieve this

096.10 Also counter sink the 4 mm holes in the copy of the vane base

096.12 Also counter sink the 6 mm holes in the copy of the vane base



096.13 Clamp the rope washer in a vise and with a hammer...



096.14 ...bend it like this



096.15 The rope washer keeps the steering lines in the groove.

To insert the m6x20 flathead screw...

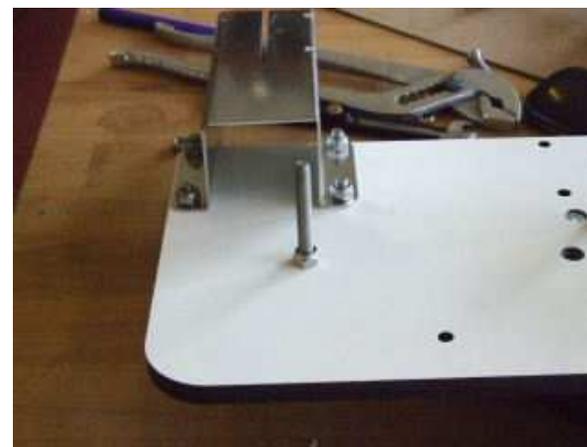


096.16 ...the hole needs to be counter sunk first



096.17 Connect the mast bracket with the vanebase using m6x20 mm flat head screws

(off centre if you use the off centre kit)



096.18 With the off centre kit, also mount a m6x55 mm screw in the hole underneath the mast bracket, using a self locking nut

**Assembly: 096**  
**Vanebase Mr. Vane**

English  
8-4-2011

# Assembly manual



096.19 mount 2 m6x55 mm flat head screw in the hole underneath the mast bracket, using a self locking nut. Tighten well.

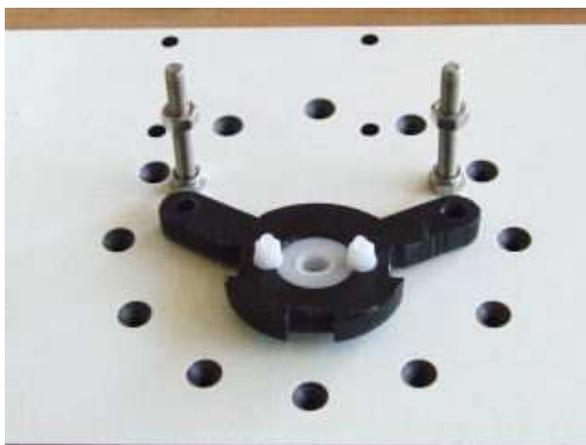
Note: If you use a cordless drill to fix the bolts, do this at a very low speed: the heat generated when using high speed may melt the self locking liner of the nut



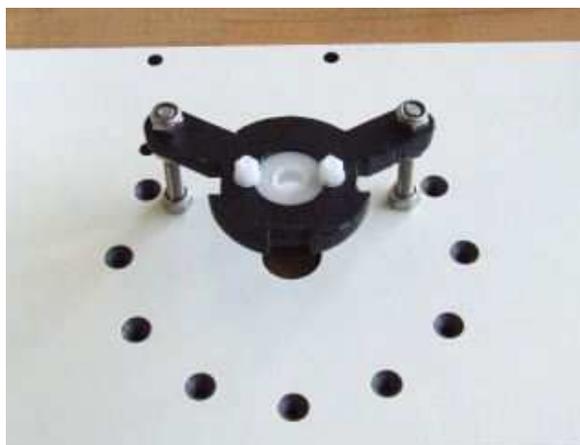
096.20 Gently de-burr all black plastic parts with a sharp utility knife if required.



096.21 Insert ballbearing in bearing carrier, CAREFULLY secure with m4 plastic nut and self locking bolt, BOLT MAY SNAP if over tightened!



096.22 Put 2 normal stainless m6 nuts on thread



096.23 Slide bearing carrier on the end of bolts, connect stainless self locking nuts to the ends and secure by turning the normal nuts towards the bearing carrier

NOTE: Put the m4 plastic self locking nuts on the outside as shown in picture to create the maximum space between the bearing carrier and the vane base



096.24 Connect first inner bearing disk to vanebase using 3 m4x35 flathead screw and self locking nut

## Assembly manual



096.25 The remaining 9 will be connected AFTER the system has been fitted to your boat using the copy of the vanebase

NOTE  
If you are not using the copy of the vane base, cary on with all



096.26 Turn over the outerbearing disk and insert the kickup hinge in to outer bearing disk by gently tapping with a hammer



096.27 repeat with the kickup bracket



096.28 Flanges of kickup bracket may come in to contact with inner bearing disk. File away when necceserry



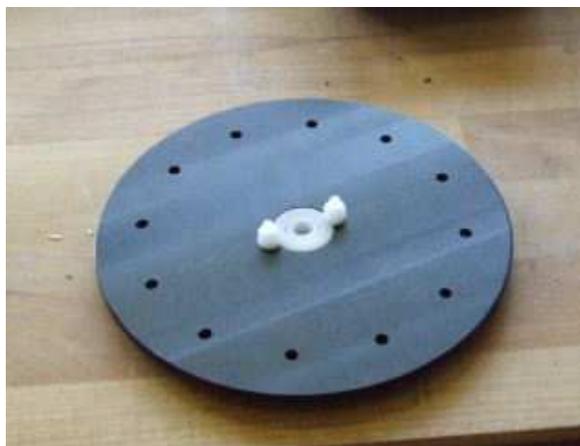
096.29 Secure with self tapping screws (5 in total)



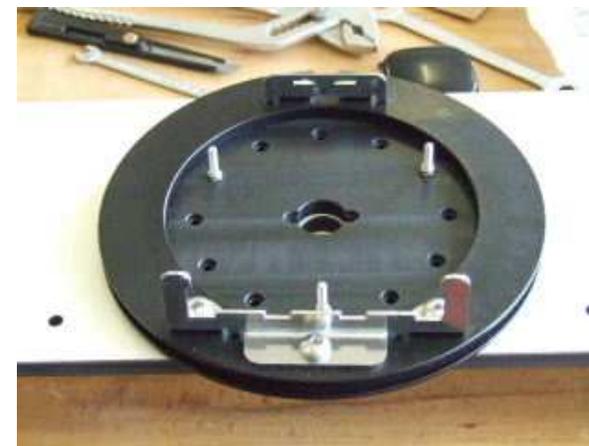
096.30 After the system is instaled to your boat the steering lines are connected like this



096.31 insert ball bearing in to remaining inner bearing disk, insert m4x16 plastic bolt from this side and...



096.32 ... secure with self locking plastic nut from other side



096.33 Put outer bearing disk on inner bearing disk on vanebase...

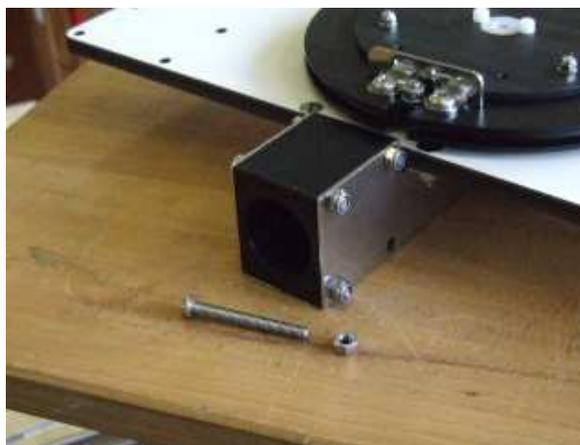


096.34 Then connect second inner bearing disk and secure with 3 stainless self locking nuts.

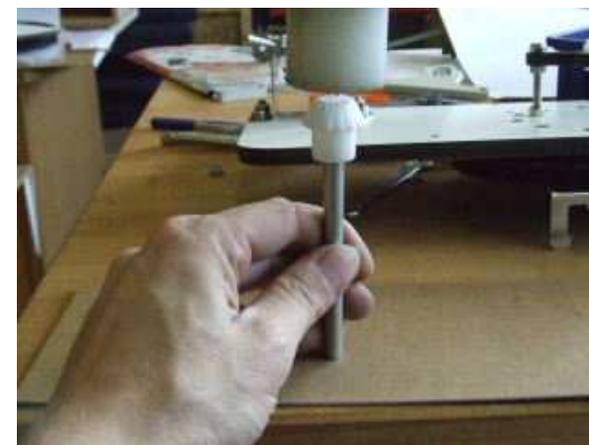
**IMPORTANT**

Do not overtighten the nuts. For the best operation the outer bearing disk should rotate as freely as possible but without any other movement.

To loose increases wear on the bearing disk  
To tight reduces light wind performance and increases wear  
A bit of resistance is acceptable



096.35 Connect mast clamp to mastbracket using 4 stainless m6x55 mm bolts and self locking nuts. Tighten only loosely



096.36 Tap small gear on to the gear axle (the long stainless steel 8 mm tube)...

## Assembly manual



096.37 ...untill it the long part sticks out by 78 mm...



096.38 Drill a 3 mm hole through the side of the small gear and the gear axle...



096.39 ...secure with the 3.5 mm self tapping screw



096.39 ...secure with the 3.5 mm self tapping screw



096.40 Add the plastic 6mm long spacer around the gear axle. (shorter and longer ones are provided just in case you might need them later on)



096.41 Carefully insert the gear axle in to the ball bearing in the inner bearing disk



096.42 Guide it through the bearing at the other side of the vanebase until it is at its deepest



096.43 Deburr the ends of the stainless 8x15mm m6 spacer with a file and/or sandpaper



096.44 Connect the 2 sheaves to the vanebase using a m6x40mm bolts, 2 m6x18mm washers, the previously finished spacers, and a self locking nut, in the sequence shown here



096.45 If you are using the mounting system, the mounting brackets connect to these bolts.

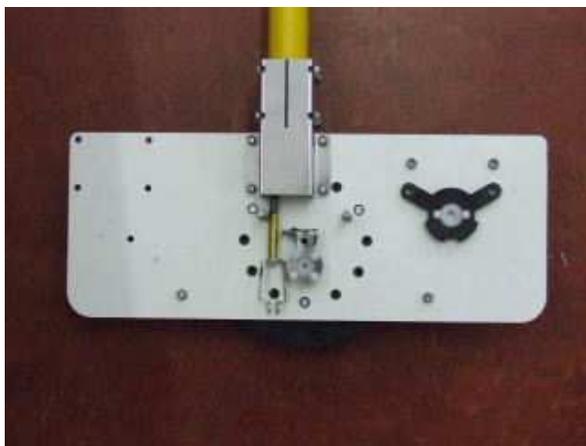


096.46 Slide the 37 mm tube of the mast in to the mast clamp and let it rest on the vanebase.

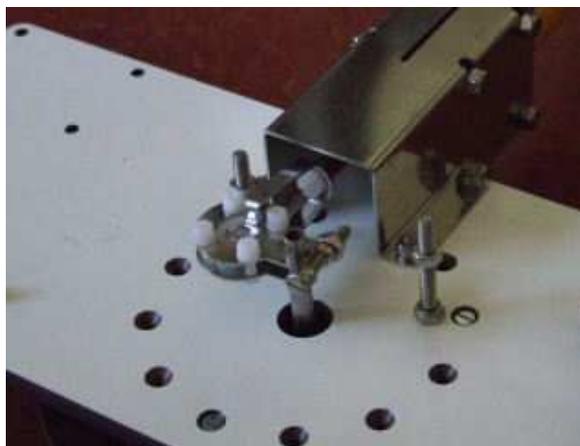
Tighten the nuts and bolts until you can no longer twist the mast inside the mast clamp. Do NOT tighten further.

096.47 insert the pusrod in to the vane mast from the bottom up...

## Assembly manual



096.48 Remove the bearing carrier and loosen the gear axle lever so it can slide on the gear axle...



096.49 Then connect the stainless fork to the bearing in the gear axle lever using a piece of the opaque plastic tube inserted in to the bearing, a plastic m6x16 mm bolt and a plastic self locking nut

(Picture shows starbord mounted vane mast)



096.50 Slide the gear axle lever towards the vane base until the nut/bolt almost touches it.

Tighten the gear axle lever to the gear axle



096.51 Connect the windvane to the top of the vane mast



096.52 Support the assembly like this so you can move the windvane freely



096.53 Insert clip in to plastic fork and bearing...



096.54 ...and click to fix



096.55 Reconnect the bearing carrier

The centre of the bearing in the gear axle lever should correspond with the gap in the bearing carrier (with the OFF CENTRE KIT the bottom gap is the reference point)

If this is not the case, adjust the length of the vane mast at the 30/37 mm mast connector



096.56 with the OFF CENTRE KIT the bottom gap is the reference point



096.57 You need to bend the Kick-up levers yourself



096.58 Clamp in vice and bend with help of a hammer.

**IMPORTANT:** Bend one to the right and one to the left!



096.59 Attach kick up lever (on the inside) and kick up lever guide (on the outside) to pendulum bracket using m6x16 mm screw and selflocking nut. The hinges (on the left in this picture) should have just a bit of friction so the levers stay in position.



096.60 Closing the lever should have a little resistance, but closing should be possible with one finger to start with.

If the pendulum rudder separates during sailing without apparent reason, adjust the friction with the nut and bolt next to the fingertip.



096.61 Maybe a bit of filing to the pendulum bracket...



096.62 ...or the kick up hinge...



096.63 ...or the kick up bracket is needed to...



096.64 ...get the pendulum bracket fit to the outer bearing disk.



096.65 Loosely connect the pendulum bearing tube to pendulum bracket using the big green tube clamps, 4 m6x75 mm bolts, 4 m6x18 mm washers, and 4 M6 nuts.

Leave room for the pendulum bearing tube to slide inside the green tube clamp, DO NOT FULLY TIGHTEN YET



096.66 CAREFULL:  
With the kick up levers open, the pendulum rudder assembly can now be connected to the outer bearing disk

Close the kick up levers to connect the pendulum rudder to the OB disk.

Check if the big and small gear meet correctly!  
DO NOT FORCE the connection if the gears meet to early! Slide the pendulum bearing tube down inside the big green tube clamps if needed



096.69 IMPORTANT:  
The pendulumrudder represents one third of the value of the total system and it is designed to separate from the system in the rare event of colliding with an object in the water.

KEEP IT TIED TO THE BOAT at all times!



096.67 This is the most important part in getting a sensitive system.

There should be a hint of movement between the two gears. If the gears are to tight together or to loose, move by 0.5 mm at a time.

If the gears are to tight the windvane can not provide accurate input to the pendulum rudder resulting in a zig-zag course, especially in light winds. If the gears are to loose the input from the windvane does not start the steering action immediately which may also lead to a (less severe)



096.68 Slide the pendulum bearing tube up or down inside the big green tube clamps untill the big and small gear meet WITHOUT PLAY AND WITHOUT FRICTION

Tighten the big green tube clamps THEN CHECK FOR FRICTION OR PLAY BETWEEN THE GEARS Adjust if needed

096.70 After the system has been fitted to your boat with the copy of the vane base, remove the copy. Drill the new holes for mounting the system in to the plastic vane base.

Reassemble the system, now using all 12 m4 stainless bolts to connect the bearing disks.

The system is now ready to be mounted to the boat!