

# A New Autopilot for my Cornish Shrimper

By Richard Shaw, Shrimper 218 (*Gamba*), (March 2012)

When I bought GAMBAs (218) in 2003 the vendor included in the sale his Autohelm tiller pilot which he had purchased with the boat when she was brand new in 1986 (photo A). I have not used it a lot, but since I usually sail single handed, it has proved particularly useful when putting up the sails in restricted waters such as the Lymington River.



**Photo A: Old Autohelm in Place**

However, over the years its behaviour has occasionally become eccentric, which has shaken my confidence in its reliability. The local marine electronics workshop, to which I took it for servicing, pronounced that it had reached the end of its useful life and was not worth repairing. He would say that, wouldn't he?

Enquiries from other Shrimper owners and the local chandler revealed that the Raymarine ST1000 Tiller Pilot is the modern replacement, and Father Christmas (on good advice) delivered one to me last December. During a pause in the festivities I slipped out to *GAMBAs*, then sitting on her trailer in my garden, and optimistically fitted the new autopilot to the old fittings, which comprised a vertical mounting on the small (starboard) hatch cover and a Z shaped metal bracket on the tiller (see photo A). It would be more accurate to say that I tried to fit it, since it became immediately apparent that the dimensions of the ST1000, though similar to those of the old Autohelm, were different.

Careful study of the manual (pages 31 to 32 – see link on page 4 below) revealed that the critical dimensions were somewhat larger, and that I would have to purchase a new cantilever bracket (part no D031) to support the base pin about which the autopilot rotates. Locating this required a careful study in geometry with the rudder and tiller fitted together on a work bench.

The tiller bracket is secured by two bolts running vertically through the tiller and held in place by large wing nuts that enable it to be removed when not in use (see photos B and C). The good news was that the old bracket was suitable for the new autopilot, and it was only necessary to drill one new hole to relocate the bracket 9.5 cm towards the forward end of the tiller. The old forward hole then became the securing point for

the after bolt. I have fitted a new stainless steel bolt in the redundant hole, which will hopefully keep the water out. Whether the designers of the new Tiller Pilot chose the dimension deliberately to avoid the need for two new holes in the tiller I do not know. I rather doubt it. However, having checked the dimensions in the manual and on the boat with my son, who is a better mathematician than I am, we concluded that this arrangement works.



**Photo B: Tiller Bracket in Original Position**



**Photo C: Tiller Bracket in New Position**

The cantilever bracket (photo D) was obtainable from a Lymington chandler for £62, which seemed a lot for what it provides, but it certainly does the job. The principal items are a circular mounting ring with a threaded hole in the middle into which the cantilever rod screws. The rod can thus be removed when the autopilot is not in use. The third item is a cap which fits onto the end of the rod and has a hole running vertically through it to accept the mounting pin supporting on the autopilot.



**Photo D: Cantilever Mounting Kit**

Once again, careful measurement of the geometry is required to fix the correct position of the mounting pin, and thus the position of the mounting ring, on the inside face of the cockpit coaming, but the instructions in the manual are quite clear. I found that it was best to drill one hole into the coaming and locate the exact position of the mounting ring before drilling the other two holes. I don't like drilling holes in my Shrimper at any time, but having consulted the Internet about drilling into GRP, it proved surprisingly simple. The secret seems to be to use a sharp drill (6mm) and not to push too hard. This latter avoids the GRP splintering as the drill cuts in, and results in a neat clean hole.

With one bolt in place it is fairly easy to locate the backing plate then attach with a washer and nut. This required removal of the old fenders, oilskins, etc., stowed in the starboard after locker so that I could reach up behind the coaming, but the distance is not great. Clearing out that locker was, in any event, long overdue. Once the location of the mounting plate has been confirmed the holes for the two further bolts can be drilled in precisely the right place, the backing plate re-fitted, and the bolts tightened.

The last stage is probably the most tricky. The cantilever rod has to be cut to exactly the right length and the cap glued in place with the two-pot epoxy adhesive supplied in

the kit. The rod is made of solid aluminium, but is easily cut through in about 10 minutes with a sharp hacksaw blade. The critical part is locating the cap, which has to be positioned with the hole exactly vertical before the epoxy cures. The manual is particularly emphatic about this.

What the manual does not tell you is that if a generous quantity of epoxy is spread on the inside of the cap it creates an airtight seal, which prevents the cap from being pushed into place. I recommend leaving a small section free of epoxy initially, which allows the air to escape as the cap is pushed home. If you then rotate the cap, this will spread the epoxy over the whole of the contact surfaces, but you must then double check that the hole in the cap is exactly vertical when the rod is screwed firmly home into the mounting ring.

Once the adhesive has cured it is wise to slacken the three securing bolts on the mounting ring and lightly coat the surface between it and the coaming with clear sealant, not included in the kit, before re-tightening the bolts. This avoids any possible leakage through the bolt holes.

The final stage is to replace the 12 volt power supply socket (if necessary). My old Autopilot was fed by a two pin socket mounted on the starboard after cockpit bulkhead. The ST 1000 is supplied with a six pin connector which enables the Tiller Pilot to receive signals from a Raytheon GPS and other electronic navigation systems. These are unlikely to be installed in a Cornish Shrimper, but the substitution of the old two pin socket with the new six pin socket was straightforward, and the new one appears to be more waterproof and neater.

The result is an assembly which is simple and strong (see photo E), and allows the Shrimper sailor to make a cup of tea while his/her boat sails a steady course. It goes without saying that a good look out is indispensable before handing over the helm to the auto pilot, and while it is steering.



**Photo E: New Tiller Pilot in Place**

The Raymarine Tiller Pilot Manual can be found at:

<http://www.raymarine.com/ProductDetail.aspx?SITE=1&SECTION=2&PAGE=87&PRODUCT=193>