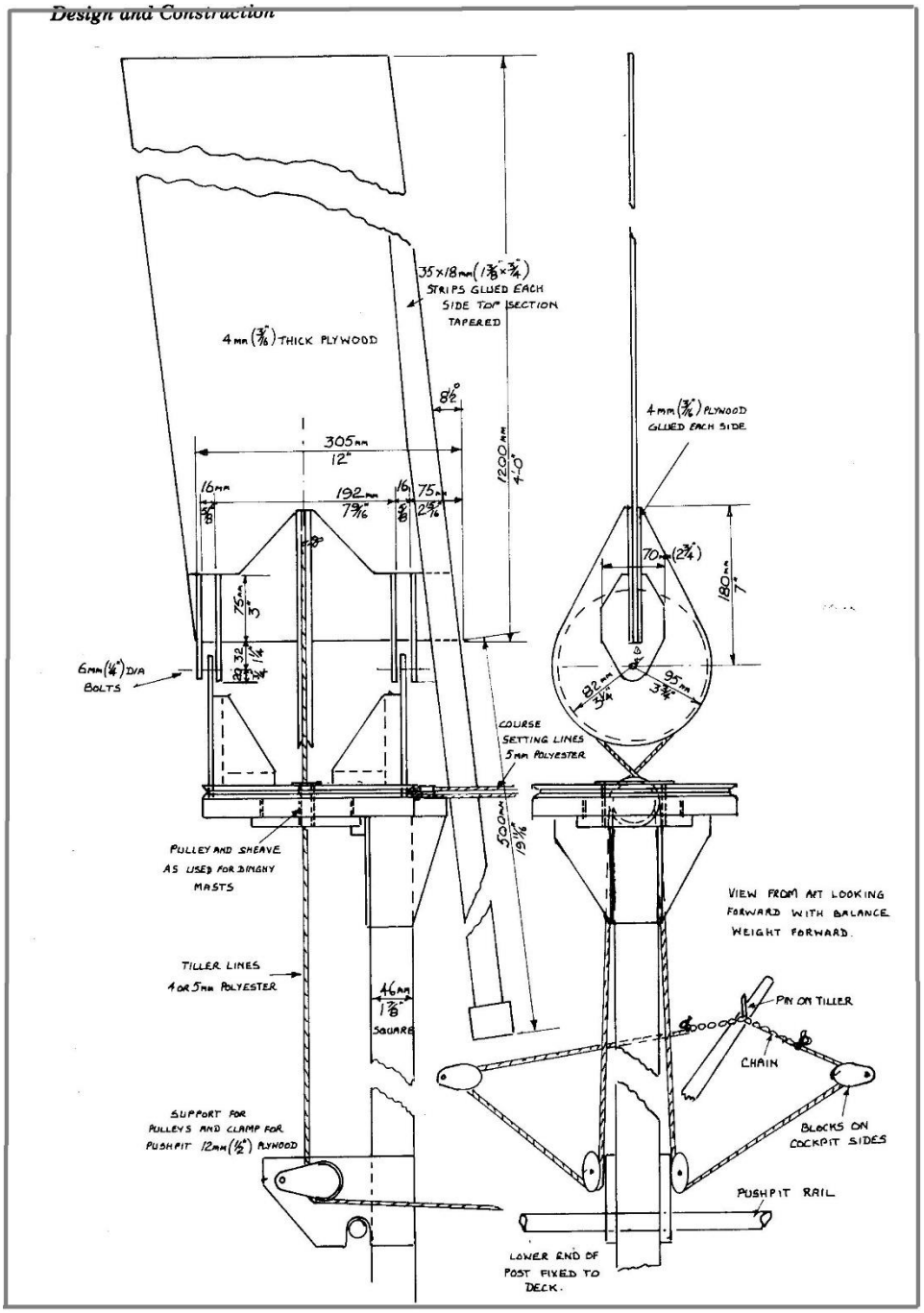
Otto,

Malena's wind-vane steering

Back in 1988 I got the idea that I wanted to sail my 7.1m/1400kg, Albin Viggen, Malena (still with Bermuda rig), over to Shetland during my summer holidays. To make the journey easier, I found I needed a wind-vane steering of some sort. Without global ambitions, I decided that buying one of those factory-made gears would be an overkill. Instead, I bought the book, "Yacht wind-vane steering", written by Bill Belcher. I chose his OGT Mk II design with direct connection to Malena's tiller. This is mainly a wood and plywood design, which would require moderate skills and simple tools to build. I soon named the gear *Otto*.



Belcher's OGT Mk II design, basis for my 'Otto'

The construction work turned out to be fairly simple, much thanks to epoxy glue which let me edge-glue and then 'weld' bits in place. Otto did a fine job in steering us over to Shetland and back in 1989. It really impressed us how it could keep Malena on an arrow-straight course while running before, with mainsail and jib to each side (no poling out of the jib necessary!).

19890512 leaving Norway, bound for Lerwick, Shetland.

Apart from the use of epoxy, Otto was built very closely to the original design. Only 2-3 details were added:

- The 'steering wheel'. This can be spotted just aft of the cockpit coaming. It made setting the course easier.
- 'The needle shaft'. I made the vane's horizontal shaft from a long brass pin. This was also useful when gluing on the shaft bearing bits onto the vane: It ensured perfect alignment during the gluing process (photos overleaf).
- Special quick-release hooks made of aluminium let me quickly connect and disconnect the steering lines to the vane's big pulley (page 4)

Together, the aluminium hooks and the brass needle shaft let me quickly install and remove the big windvane.

Since 1991, Otto has been collecting dust in my attic. I found that the weather helm produced when running before with a JR, combined with the un-balanced rudder, was too much for Otto to cope with. On the photos overleaf I have brought Otto downstairs for taking a few photos (excuse the dust).

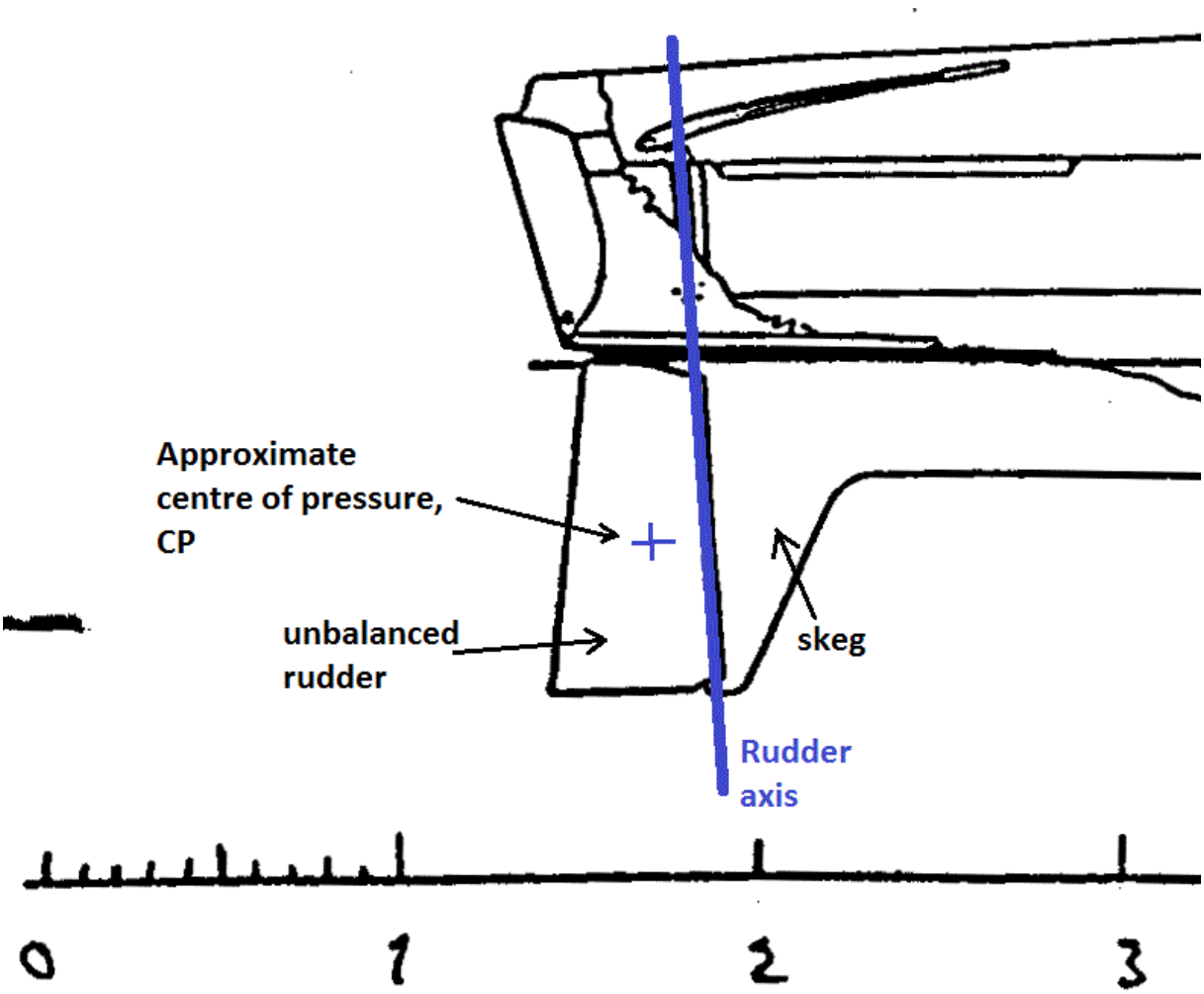
Here the needle-type horizontal shaft can be seen. It was just held in place with a line.

‘Dusty details’ showing how epoxy ensured easy and strong fittings

One of the two aluminium hooks which made clipping the steering lines on easy.

The course-settingwheel. Ordinary 1-pot varnish was used over all. I should have used 2-pot...

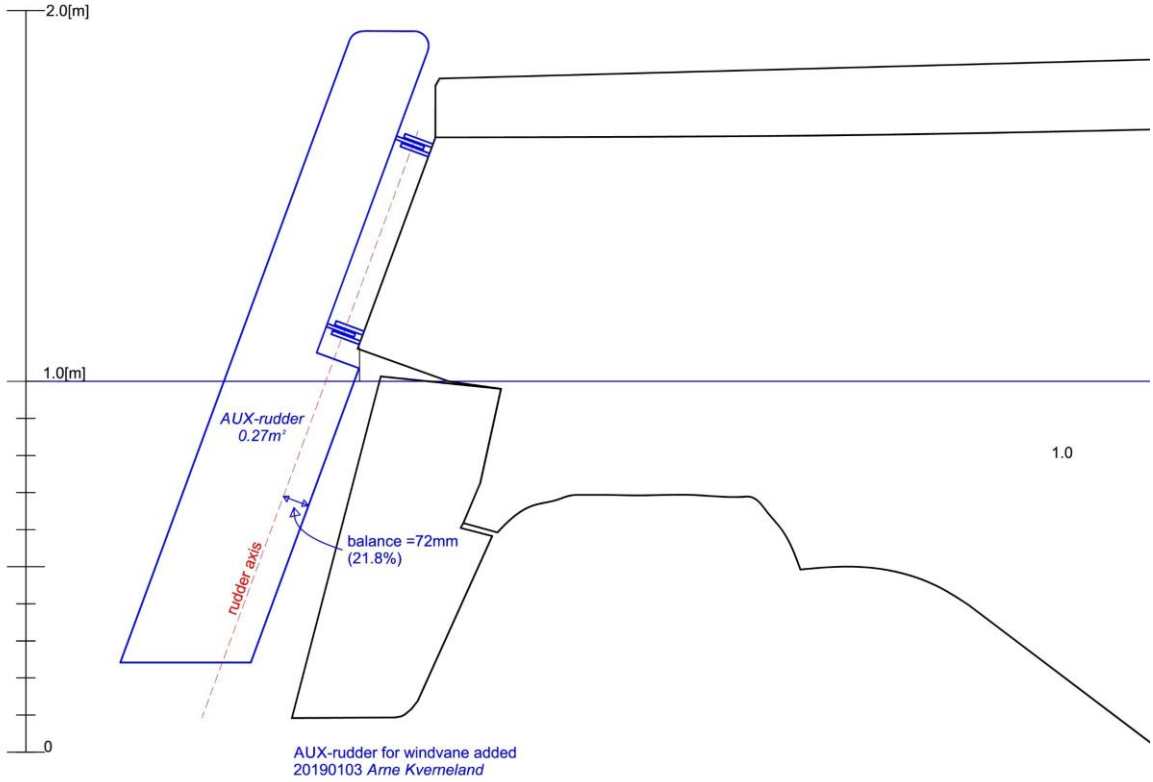
Feedback:
Bill Belcher worked much as a delivery skipper, and quite often he built and fitted one of his wind-vanes just for the trip. He thus gained a lot of experience with how different boats would need different steering gears.
He was very aware of that some sort of negative feedback was needed to avoid over-steering the boat. However, he also showed that some boats with good directional stability could be made to work without any negative feedback. My Malena was such a boat. Otto's steering line was connected to her tiller with no sort of negative feedback (for instance tilted horizontal vane axis).



The rudder and skeg of the Albin Viggen.

I would not suggest the same setup on a boat which is directionally unstable (or only just stable). I guess a tilted or inclined vane axis would then be better. Best of all would be a vane gear with *adjustable* tilting angle.

Overleaf is a diagram of the after end of a *Galion 22*. This design is said to be directionally unstable. To (hopefully) make it work with an OGT MkII wind-vane, I have here suggested adding an AUX- rudder on the transom, meant for being driven just as Malena's rudder was. The original rudder could be locked to make the boat want to steer straight, just as the skeg of Malena's hull did.



A suggested AUX rudder for a Galion 22.

When not connected to the wind-vane, it could be linked to the main rudder and thus greatly improve control with reduced rudder angles.

Stavanger, 4th Jan. 2019
in haste,
Arne Kverneland.