A rig for comparing wind drag of different objects

This started with a wish to reduce the drag of *Johanna*'s mast. I have always felt that she is not as good upwind on "the good tack" as on "the bad" (port) one. After my friend Ketil Greve fitted instruments to his *Edmond Dantes* (sailing under a copy of *Johanna*'s rig), he found that his boat went about 5° closer on port tack than on starboard at the same speed.


.. *Johanna*'s mast, LAP~9.6m, diameter at deck level=25cm. and at mast top 10cm
The "sail area" of the mast is thus close to 1.7m² - quite a drag factor on the sb. tack...

This, plus stuff I've read about drag-reduction on golf balls with dimples compared to balls with smooth surfaces, has got my brain in gear. The predicted 40 – 50% reduction in drag is the carrot...

What to find out
Since fitting a slimmer hi-tech mast is out of the question, I want to find out if the golf-ball idea can be used on *Johanna*'s mast; in short, will the drag be reduced by adding some sort of roughness on its surface?

How to measure drag
I've tried to read myself up on this on the web. It soon dawned to me that in any sort of scale (wind tunnel) test, one needed to work in nearly the same Reynolds number to get useful results. This plus the problems of building a wind tunnel ruled out scale tests. On the other hand, trying it in full scale on *Johanna*'s mast would also mean a lot of work, possibly without any success.
Today I got the idea that I don't need to measure absolute values of drag. I only need to compare a test object (piece of mast with rough surface) with a reference object (piece of smooth mast).
On next page I've just made a sketch for a rig to compare drag of different objects. It is meant to be taken outside in undisturbed wind. The beam from which the objects are hung, is free to rotate around the pivot point P. The length of PA and PB can be adjusted until the rig is in balance without rotating. The found relative lengths of PA and PB can then be used to find the relative wind forces (drag) on the test object. Easy peasy (..in theory...)!
On the sketch below the test objects are 1.5m x 0.175m tubes. Those 17,5cm happen to be the average diameter of *Johanna*'s mast so we should be working with about the same Reynolds number as on the real mast.

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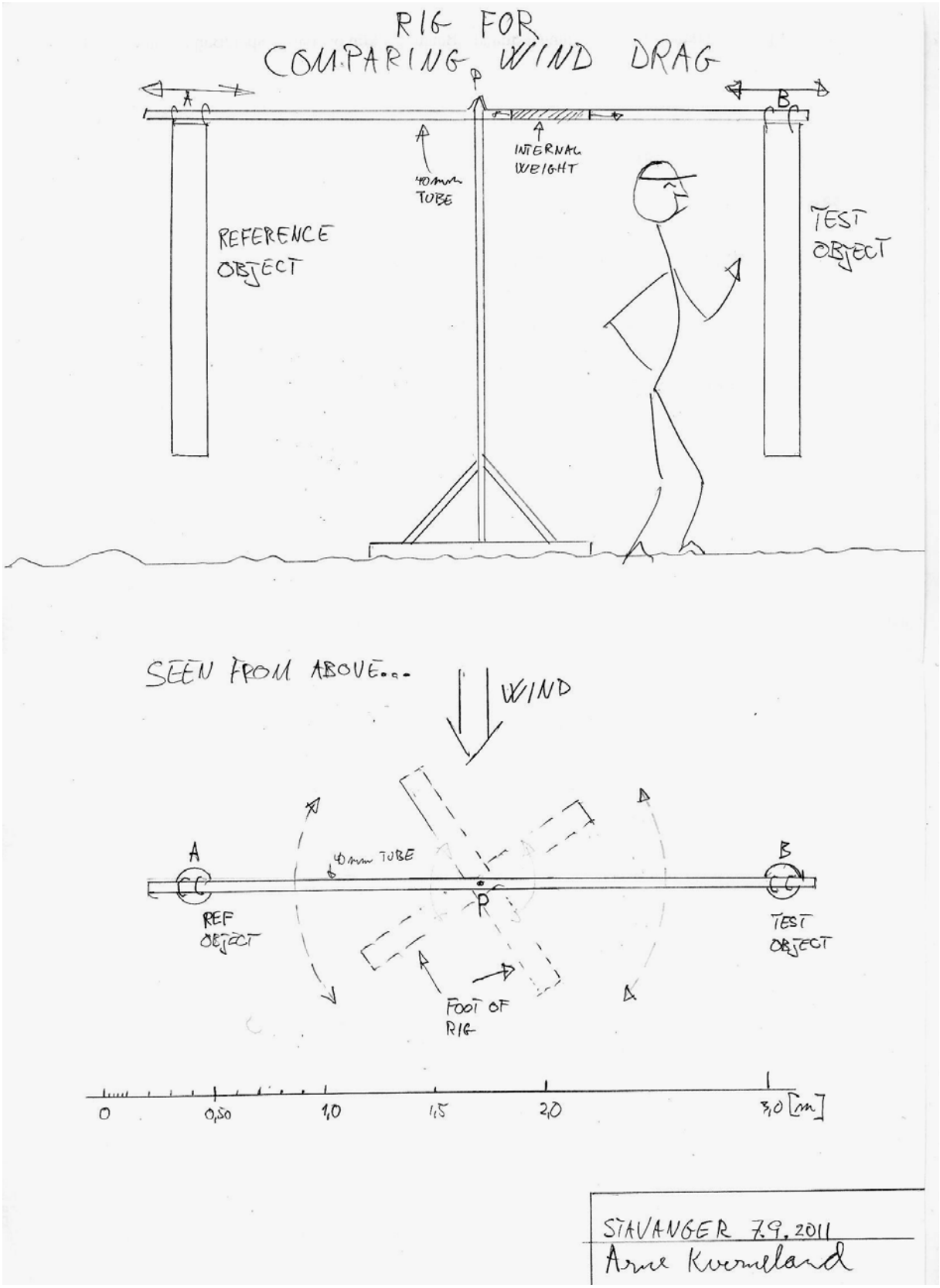

PS:
The rig could of course be used to compare drag of many other sorts of object. Only the fantasy (and need) is the limit...