

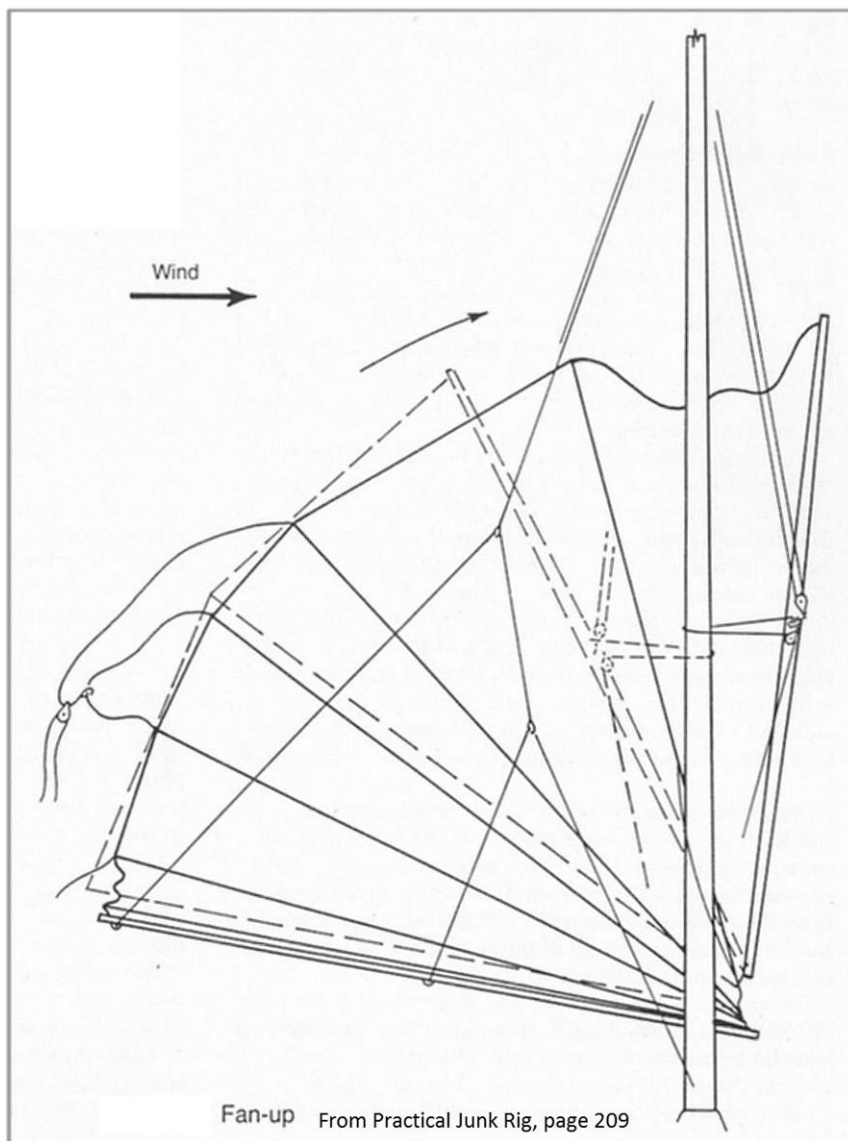
# A fan-up preventer (FUP) which can be operated from the cockpit

by Arne Kverneland

( The ambition with this little note is to explain some of the whys and hows around the problem of fan-up in junksails. It certainly is not meant to be the final word, but rather an invitation to everyone to contribute to find good and simple solutions .)

## What happens is...

From time to time junkrig sailors report that they have suffered a «fan-up» when gybing their sail(s). As far as I know, this only happens during long gybes, that is, when gybing the reefed, squared-out sail without sheeting it in first.



The drawing above (PJR, p. 209) shows what happens: The yard and some of the battens swing (i.e. fan up) forward, enough to get entangled in the lazyjacks, mast lift etc. The driving force behind a fan-up during a long gybe is one or both of these factors:

1. The strong wind (.. a fan-up is a strong wind phenomenon...) may be enough to grab the upper panels and force the top section and yard over, as shown in the diagram above.
2. The other factor may be that the boat is rolling badly in a seaway. This could simply fling the yard over, possibly encouraged by the wind.

During a long gybe, the normally down-pulling sheets will go slack and will not prevent the fan-up from happening.

The result can be very serious, in particular when sailing offshore in strong winds and heavy seas: The fanned-up and jammed sail may be terribly reluctant to come down without using destructive means (read: knife, taped to a boat hook). The poor sailor, being used to controlling the sail from the cockpit, or even the hatch, suddenly has to fight on deck under harsh conditions, to get the sail down. *This is a serious drawback of the junkrig (most of them), so reliable ways to avoid fan-ups **must** be found - and be used as well.*

There already are a couple of simple, but a bit awkward methods to avoid the fan-up:

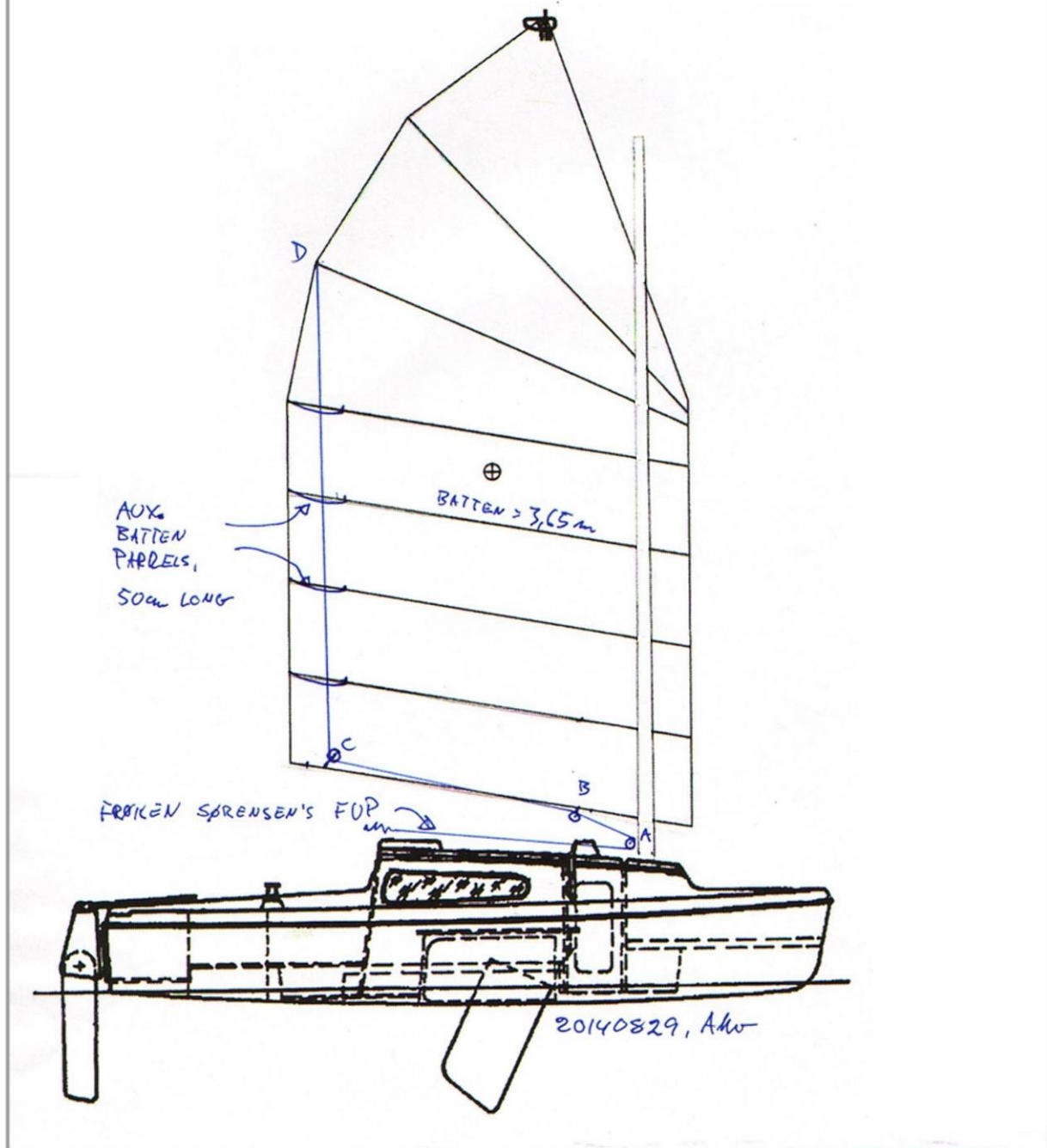
- *Only make short gybes.* This is well and fine with boats below one ton. I use short gybes regularly on my own boat, the 740kg *Frøken Sørensen* (FS). However, on bigger boats the short gybe would call for big muscles or an electric sheet winch to sheet in the sail first.
- *Never gybe!* A well-known JRA member rather tacks his X-99 around than gybing in anything but light winds. I too used to tack my 3 ton/48sqm Johanna around this way, in winds over F4. However, this is not for everyone and it is not always a realistic practice when sailing offshore in heavy seas.
- *Drop the sail and short-gybe the furled bundle.* If in need for gybing when offshore in F6 and above, the sail area is already down on four panels or less, so dropping that scrap of sail, sheeting in the bundle, and then re-hoisting the few panels after the gybe, is doable, in particular with the help of a windvane steering.
- Keep a piece of line ready and tie the lowest batten in use to the reefed-away bundle, just as with Bermudan or gaff rigs. This may work on some boats where you can reach the sail, but it means deck work, and is not that easy on a wet and windy night...
- The yard may be fitted with its own “batten parrel”. This could stop it from swinging forward of the mast, as it does on the diagram above, but it will not prevent the yard and upper battens from getting trapped forward of the topping lifts, which is bad enough.

Unfortunately, a long gybe may decide to happen accidentally, caused by sudden windshifts etc, so some sort of FUP-preventer will anyway be needed.

### **Possible ways...**

The summer in Stavanger has been exceptionally fine this year. Only now, after 30 outings in *Frøken Sørensen*, did I get around to think more of this. Earlier I had already thought of a possible solution, called the FUP Mark 1 here. This is the only one I have tried. I found it to be so good that I will not bother with trying Mk 2 or 3, but just let you see them in case you want to have a try:

## FUP Mk1, as tested on *Frøken Sørensen*

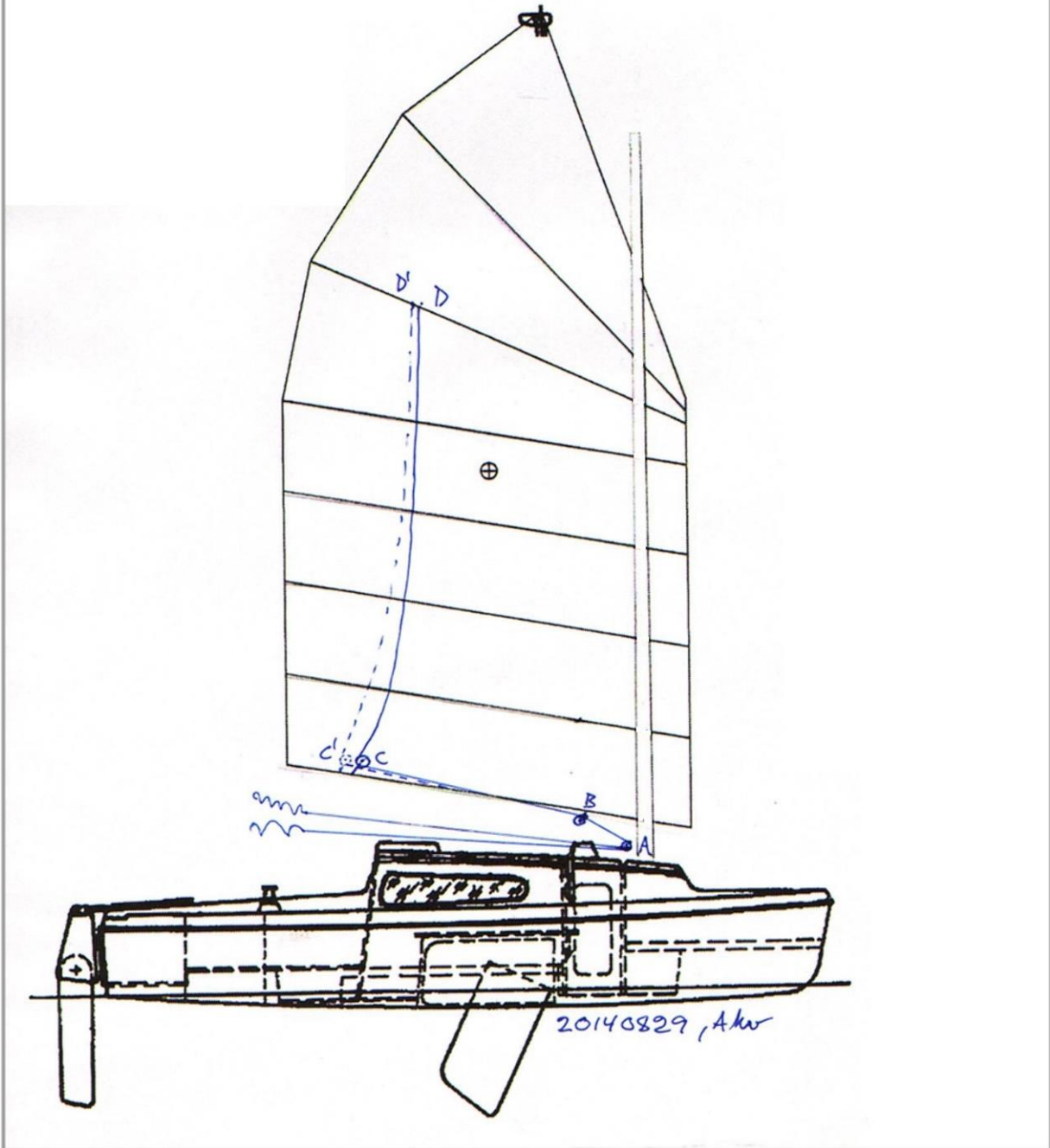


FUP Mark 1, as tried on my 6.5m/740kg/20sqm Greif 650, Frøken Sørensen.

**The FUP, Mk1** consists of a single running line (4mm braided dinghy sheet), running forward from the cockpit and over block A, B and C (C is just a thimble), and finally up to batten 2 at D. On beforehand I had fitted “aux. batten parrels” to batten 3 – 6, under which the FUP line was passed. This was in the hope that they would collect the line, so I would not have to look after it all the time.

Each time a panel is lowered, the FUP line will go slack. By taking in the slack (at your leisure), batten 2 will be held down and prevented from fanning up. In addition, any battens below batten 2 will be prevented from fanning past batten 2, thanks to the aux. batten parrels.

**FUP, Mk2, not tried.**

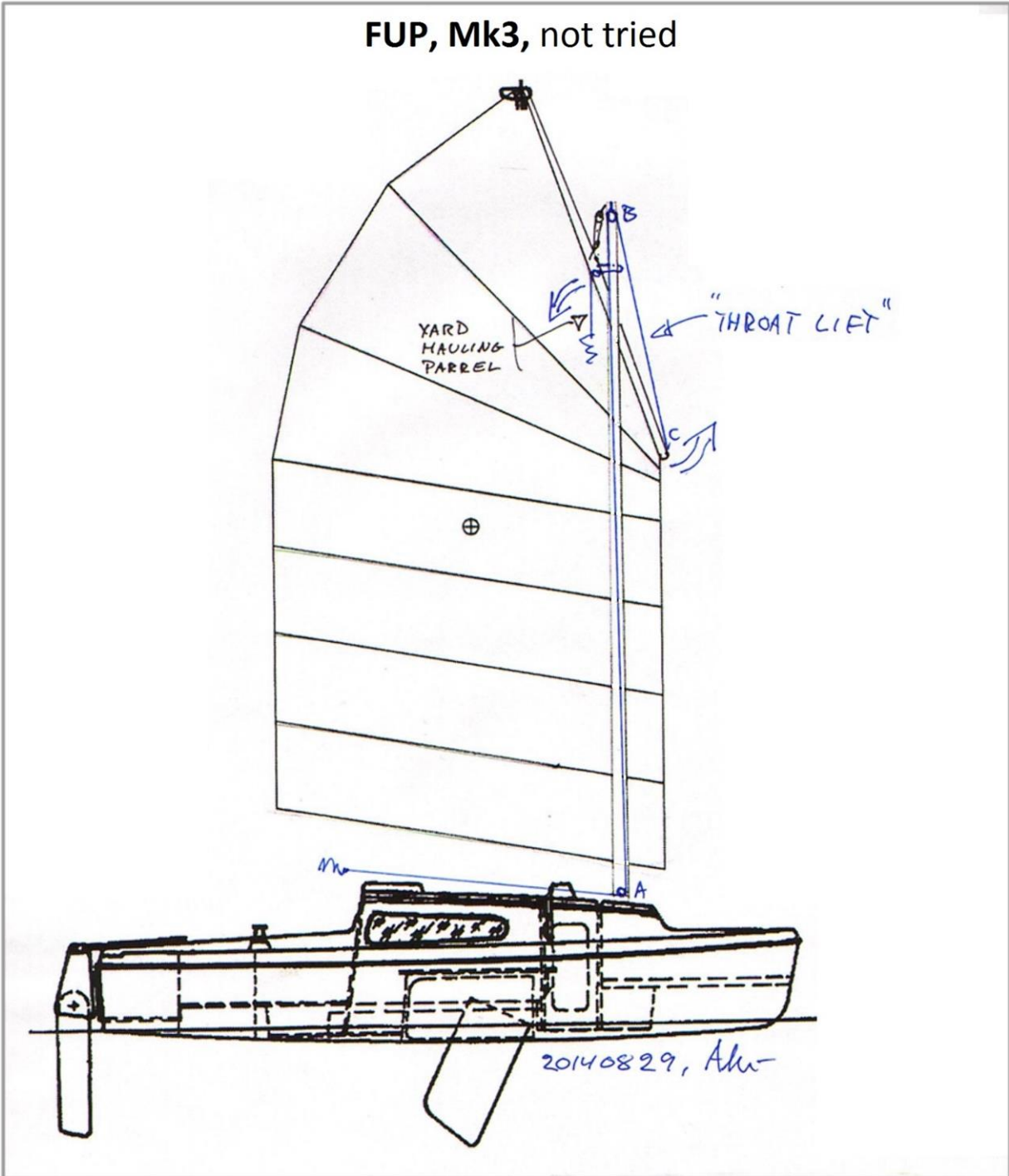


**FUP Mark 2, thought of as a plan B if Mark 1 failed. Not tried**

### **FUP Mk2**

In case Mk1 somehow should turn out to be awkward in use, with too much friction, for instance, I thought this version might be worth a try. The diagram should mainly explain itself: By fitting one FUP line on each side of the sail, they will again prevent the battens below batten 2 from fanning up past it. I fear that this version will need some more immediate attention, as the free lines between C and D will fly around each time the sail is being lowered. Before fitting this FUP, some half-strong loops would be needed at point D, on both sides of the sail.

### FUP, Mk3, not tried



FUP Mark 3, meant to make use of the spare halyard. Not tried

### FUP Mk3

Only after I had sailed with the Mk1, recently, did it strike me that one could effectively lock the yard from fanning up by using what I call a *Throat Lift* (A-B-C). In case one has already fitted a single part spare halyard, this could be given a second duty. With both this and the yard hauling parrel working, the yard will very effectively be prevented from fanning up, at least as long as the yard angle is not steeper than here (70°). However, this type alone will not keep the battens under full control.

### **Trying out FUP Mk1 on Frøken Sørensen...**

After having fitted the aux. batten parrels the day before, on 28<sup>th</sup> August I could tie on the blocks A and B and the thimble C, then reeve the FUP line, and go sailing. The wind was fine for a test, blowing F4 with some gusts in it. Being alone on board, I soon found I needed to drop two panels, which suited me fine. Here are some photos I took:



**The sail has just been set with only 5 panels up. The thin, red FUP-line can just be spotted.**



**The red 4mm FUP line passes through block A and B, and thus provides some kicking strap effect**



Here an *aux. batten parrel* can be seen, keeping the FUP line under some control, when slack...



..like here...



**..or here, where most of the sail has been lowered. Only a couple of short bights of the FUP line can be seen hanging below the boom, thanks again to the aux. batten parrels.**



**The FUP line only barely cuts into the sail from the leeward side, much less than the lazyjacks.**



The test was performed on the Åmøyfjord, just north of Lundsvågen harbour. My first impression was that the FUP was at least not causing any handling problems. The added friction when hoisting sail was only just noticeable. When pulling the line, it very positively tied batten 2 down without signs of the boom lifting. The way the FUP line is lead, over blocks A and B has a kicking strap effect. I then performed 4 -5 long gybes with 5 panels up. There was not the slightest problem. This is something I have never dared to do in FS before. Reefing and un-reefing went well. It was very easy to take in the slack of the FUP line after reefing or lowering the sail. When I forgot to cast off the FUP line before an un-reefing, the feedback was easy to detect - a tail-heavy sail. Then I just undid the line and continued raising the sail, no problem. It soon became second nature to adjust the FUP, just as with the throat and yard hauling parrels. The only difference is that the FUP line is quicker to adjust. When making the rig of Frøken Sørensen, I took care to get the batten ends flush with the leech and not using eye-bolts. This has paid off and there was no way the slack FUP line could catch anything there.

### **Conclusion.**

I like the FUP Mk1 a lot. Although this fair-weather test is no proof that it will work in a gale, I struggle with seeing why it should not. I most certainly will keep it on Frøken Sørensen, and I will also fit it to my next boat. For serious offshore use, it may be an idea to make the boom a little stronger than I have used to have (same as the lower battens). I guess the section used on batten 2 would be OK, as I don't reckon the fan-up forces to be very strong. The tack line should be moved aft to 45°. This adds to the kicking strap effect (in addition to keeping the boom from sliding aft). I have already moved the tack line on FS. The success of this preventer kept me from bothering with trying the Mk2, and since my little boat does not have a spare halyard, there was no way I could try the FUP Mk3. Still, I think this last version may makes sense on really large junks where the yard is big and heavy. Or what do you think?

Stavanger, 20140830,

*Arne Kverneland*

PS: So now the grand total of running lines of the rig has risen to five; the halyard, sheet, THP, YHP - and now the FUP. I can live with that.



**FS, a really handy little test bed for rig fiddlers...**

## Appendix, 20180905, summing up the experience with the FUP.

Since the text above was written, four years ago, I have been using the MkI-version of the FUP, first on *Frøken Sørensen* and since 2017 on my Marieholm IF, *Ingeborg*. I choose not to edit that text, but rather add this appendix, below:



20180904 Details around my FUP MkIb setup in Ingeborg (.. note - the sail has only 7 panels...)

During another trip on the fjord yesterday, which included a couple of long gybes with only four panels set, I, hoisted the sail fully and could take these two photos (p.10) while running before. See notes made right at the photos. As can be seen, the FUP line is passed over thimbles at C and B. If you still have too much friction, it may be an idea to replace these with good blocks.

**Does the FUP work? Does it prevent the yard from flying forward?**

Yes, I have found that the FUP definitely holds the yard from fanning forward. On my present boat, I have found that I can easily test its function in harbour: With two, three or four panels up, it is possible to make a 'slow fan-up' by simply hauling in on the yard hauling parrel, YHP. This way, the peak of the yard can be brought to move forward of the toppinglift and thus cause that troublesome situation when the sail refuses to come down. If I on the other hand set up the FUP line before this exercise, there is no way the yard can be peaked up and cause a fan-up.

This helps me during practical sailing as well: Since sailing with two or three panels is something I do frequently when entering my harbour under sail, I soon learned that overdoing the peaking up with the YHP could get me into trouble. However, if I take in the slack of the FUP line as the sail is being reduced, I am safe. This is the same as preventing a fan-up during a long gybe.

The firm conclusion is that the FUP MkI does what it was meant to do.



**20180904 Please disregard the main motif and focus at the braced flagstaff...**

*(Actually, a bigger everyday challenge when making long gybes is to keep Ingeborg's sheet from catching everything: If the wind is weak, the sheet sweeps slowly over me, over the tiller and over any hardware on the aft deck. Luckily, I rig my sails with a vertical leech, so it never catches (or gets caught by) the battens or boom. In more*

*wind, say over about 8kts, the sheet will be flung in an arc behind the boat. Then it tries to catch the flagstaff and the outboard. The remedy on this boat has been to use this braced flagstaff. In light winds, the shrouds cover the mooring bits, and in strong winds, they hinder the flying sheet from grabbing the top of the flagstaff, as well as covering the outboard. It works.)*

### **Friction problems and how to deal with them.**

When sailing around with Frøken Sørensen, there were little problems with friction, as the sail was so light (20sqm). However, the 35sqm sail of Ingeborg added more friction. In addition, other JRA-members could tell me that the friction in their FUP systems was so bad that the system became useless.

The key to make the FUP work, is to reduce the number of friction points. In the original FUP Mk1 the FUP line was passed under a number of 'aux-batten parrels', and was then passed over several thimbles and blocks (see p.3 and 10). However, the worst hi-friction blunder I made was to pass the FUP line inside the toppinglift and lazyjacks. In my present configuration (MkIb) I have done away with most of those aux. batten parrels, and just kept the two upper ones. These have been made much longer and slacker than the originals. Their job is mainly to keep the FUP line from flying about when not in use. In addition, the FUP line is now lead forward under the boom, outside the toppinglift and lazyjacks. The result is a compromise between the need for reducing friction and the wish to keep the FUP line tidy and out of trouble.

When I drop the sail from full, one slack loop of FUP line will appear under the boom, so the first thing I do is to take in the slack of it. This is easy to do, as there is no longer any friction to speak of. Remember; this low friction when taking in the slack also means low friction next time the sail is being hoisted.

### **Final conclusion.**

I think this MkIb version of the FUP is a good compromise. It saves me from the dreaded fan-ups without adding much fuss with respect to handling the rig.

Stavanger, 5<sup>th</sup> Sep. 2018

*Arne K.*