

Hall of Fame - Arne Kverneland

by Graham Cox

Arne Kverneland 1954 -

The use of junk rig on western yachts has frequently been associated with ocean voyaging, starting with *Jester*. Others soon followed, such as *Illala*, *Galway Blazer*, *Badger*, *Zebedee*, *Tystie*, etc. The rig is particularly well-suited to this type of sailing. Fabled for its ease of handling, it was inevitable that other sailors would become interested in the rig. Soon it began to appear on yachts that sailed closer to home.

Although ease of handling was still an attractive feature for these vessels, especially if they engaged in coastal cruising, it quickly became apparent that junk rig was at a bit of a disadvantage when sailing to windward in confined waters, especially in light airs, at least compared to other rigs. Many junk sailors were philosophical about this, content to put in a few extra tacks, or to motor-sail occasionally, and to celebrate the rig's many good features. Others, though, who liked to sail smartly against the wind, began to experiment with ways of improving the windward performance of their junk rigs.

One of these people was Arne Kverneland. A cruising sailor, who sailed to Iceland in 1986 on a yacht delivery, and later to Denmark and the Shetland Islands on his own vessel, *Malena*, Arne eventually settled down to a pleasant life of daysailing and making short coastal passages out of his home port, Stavanger, in Norway. He lives just a ten minute drive from the harbour, which allows him to make regular sorties whenever the mood strikes. It has also provided an ideal base from which to engage in numerous boat projects over the years.

Despite a reputation for designing and building boats with large, efficient rigs that sail extremely well, he emphasises that he is not a racing sailor, stating: *I am perfectly happy with not having made the fastest rig, as long as my rig is cheap and easy enough to make, is simple enough to operate, will last for a good while, will perform generally well, and make me feel safe in a variety of conditions. I know that wringing out another 2-4% speed to windward will cost a lot and I am quite simply not willing to pay the price.*

Perhaps Arne's greatest achievement is that he has developed a sail plan that is undoubtedly fast and efficient, without giving up the famed qualities of junk rig; simple, reliable, easy to handle, low-tech



Arne relaxing in the cuddy cabin of Frøken Sørensen

and low budget. This has been reinforced by his highly original sail-making methods, which have made it possible for amateurs to make strong, seaworthy sails quickly and cheaply.

A lifelong sailor, Arne always had an interest in rigs. He built his first spritsail as a teenager in 1970 and later tried gaff rig, first on *Maggi*, a 26ft double-ended sloop, and then on *Malena*, his 23ft Albin Viggen sloop. He bought *Malena* in 1981 and sailed her for some years with the original Bermudan rig before testing her with a gaff mainsail, cruising to Denmark, and later to the Shetland Islands, before deciding to convert the boat to junk rig.

In 1989, he bought a copy of *Practical Junk Rig* at Lerwick, in the Shetland Islands. Returning to *Malena*, book in hand, he was delighted to recognise, across the harbour, the very boat on the cover of PJR, Jock McLeod's *Ron Glas*. Going over to introduce himself, he not only got the book autographed, but Jock later cast his eye over Arne's drawings for converting *Malena* to junk rig and gave his approval.

Malena was given a 32 sq metre, flat-cut, Hasler/McLeod junk sail in 1990. The mast was solid spruce, as was the yard. The battens and boom were heavy-walled 25mm alloy tube. Arne wanted 30mm but it wasn't available immediately and he was keen to get sailing. The sail was tanbark and looked very smart, but Arne was a bit disappointed in the performance to windward. Once, while struggling to make headway in light winds and

choppy waves, his old boat, *Maggi*, overtook *Malena* like she was standing still.

Arne was so dismayed that he briefly contemplated restoring *Malena's* gaff rig, but by then he had joined the Junk Rig Association and discovered that there were a number of people who were experimenting with the rig, with the aim of improving windward performance. The person who influenced Arne the most was Paul McKay, with an article about wishbone junk rig in *Practical Boat Owner*, and a sketch of a simple hinged batten in *JRA Newsletter # 17*. Arne decided to try fitting hinged battens.

In 1991, he cut his battens up and sleeved the joints with 40mm tube, using it as a collar to limit the amount of overlap at each joint. Together, these hinges gave *Malena's* sail about 10% camber. Arne was delighted with the result, though he later realised he should have made the leech flatter, as there was a touch too much weather helm. However, the boat sailed smartly to windward, tacked quickly, and accelerated well onto the new board. Unlike with the flat sail, he found it easy to keep *Malena* in the groove and footing well. He was unsure how strong the hinges might prove for offshore sailing but they stood up well for the season, with no signs of wear and tear on either sail or battens.

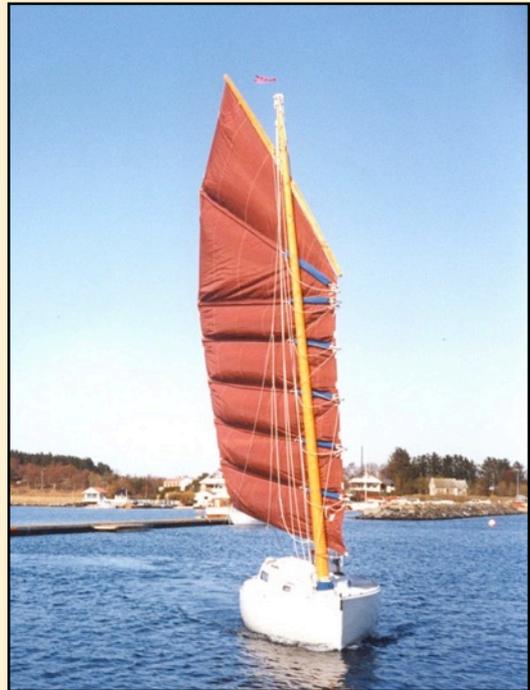


Malena with hinged battens

The rig was also a lot more powerful than the flat sail and required earlier reefing. Arne was happy to have an over-canvassed ship once more, a real wind wagon, but realised that *Malena* was a bit too tender. He considered building a hollow mast, but in the end decided to cut one metre off the existing spar and sail with one panel reefed, which he did in 1992.

This worked, but never one to rest for long, Arne then built a Reddish style sail. This sail was not a success, partially due to the battens being weak and bending too much, but mostly due to Arne's

homemade sail not setting well. There was too much slack in both luff and leech, causing excessive fluttering. However, as is often the case, this setback led to Arne's great breakthrough. To stop the fluttering, he sewed pleats in the luff and leech and discovered that this gave the sail panels a useful camber.



Malena with tucks in her original flat sail

Although the sail was now functional, Arne decided he'd like to try this method of inducing camber with his Hasler/McLeod sail. This was done by making two 10cm pleats at the luff and leech of each parallel panel, about 15cm from the batten positions. The top two, fanned, panels were only crimped at the leech. The battens were straight.

The first trial with this new sail took place on 26 December 1992, with *Malena* strapped into her berth, and Arne was delighted with the look of the sail. The luff and leech remained taut, the sail was docile, and it handled as normal, though he had to fit Hong Kong parrels to remove the diagonal creases. Unlike the hinged-batten rig, he was free to vary the balance as much as he wished. After sailing with the rig the next spring, he concluded that he'd be happy to go offshore with it.

It wasn't long before he began thinking about building a new, straight-battened sail that incorporated camber in the panels from the start. In the autumn of 1993 he built a test panel. Each of the 4.6 metre horizontal sides was given 20cm of rounding, with the maximum point of camber

being 35% abaft the luff and the panel was attached to a frame in Arne's back yard. He was delighted to observe that this test panel took up a beautiful, aerodynamically efficient-looking shape.

In May 1994 he built a new Hasler/McLeod sail out of coated nylon canvas, utilising this barrel-cut shape for each panel. He developed his own method of constructing the sail, making each panel out of one piece of material, stapling the panels together, then sewing the stapled seams. This creates a ridge-like seam, to which the batten pockets are then sewn directly. One of the best features of this method is that one does not have to feed the whole sail through the sewing machine, just offering up each seam in turn. Arne can build a complete sail in less than 50 hours.

As a result of Arne cutting the batten panels with rounding, these will bulge to present the desired camber. Unlike a flat sail, the loads are not spread over the whole sail any more, but is now concentrated at luff and leech. Like the Chinese before him, Arne relies on a substantial bolt-rope to take up these loads. It was these bolt-ropes, Arne points out, that allowed the Chinese to make their sails from fairly weak bamboo matting. Originally, Arne used traditional bolt-ropes, but later switched to using webbing, which is neater and quicker to fit.

The initial process was called *Method A*, later refined in *Method B*. Arne cheerfully admits that the method is a bit primitive and would make a professional sailmaker scream, (he advises one to avoid sailmakers if possible!) but it is easy, economical and quick to build a sail following his method. It has proved itself over time, both on Arne's boats and others, including Alan Martienssen's *Zebedee*, over thousands of miles of ocean voyaging.

Arne catalogued and recorded the process of design and construction carefully, producing a comprehensive article for *JRA Newsletter # 30* (now known as the *JRA Magazine*). It is the perfect method for building a sail on the kitchen table. At least one sail has been sewn together in a yacht's saloon, after laying out and stapling the sail together ashore.

The new sail was a great success. *Malena* was much easier on the helm than previously, because Arne placed the maximum camber at 35% of the chord, instead of midway, which moved the Centre of Pressure forward. Once he'd set up the Hong Kong parrels, and adjusted the length of the sheetlets, which took some time, he was pleased with the set of the sail, even when deeply reefed, and delighted with the performance.

In the January 2000 edition of the newsletter, Arne introduced his chain calculator, an ingenious way of calculating the amount of rounding to put in the sail's panels to get the desired camber, without complicated mathematics. In the meantime, he had bought a new yacht, a 29ft Alo 28, which he renamed *Johanna*. This boat displaced 3000kg, with 1400kg on the fin keel, and promised even greater sailing performance.

After sailing *Johanna* with her original Bermudan rig for two and a half summers, Arne converted her to junk rig. He rigged *Johanna* with a 48 sq metre cambered sail, another Hasler/McLeod type, with his latest innovation, an extra fanned panel which he calls a transitional panel, to reduce twist in the sail. He said at the time that he might have built another Reddish sail, after reading the Vincent Reddish article in *Newsletter # 40*, which explained clearly how to add camber to it, but he'd already rigged *Johanna's* new sail.



Johanna on a beam reach

Because he was short of space at the time and wanted to get the sail made quickly, Arne commissioned a professional sailmaker to make it, just fitting the webbing bolt-ropes and webbing loops himself. (Arne uses webbing loops instead of metal grommets in his sails.) Unfortunately the sailmaker made a lot of mistakes and it cost Arne *a year in delay, lots of money and buckets of trouble*. The sail had so many problems he had to ask the sailmaker to make *Johanna* another, with the original eventually being fixed up and used on *Edmond Dantes* and later on *Marie G*. Arne vowed that from then on he'd do it all himself, and he has.

The cover of *JRA Magazine # 42*, in January 2004, shows *Johanna* under sail. Once Arne had sorted out the problems, the new rig was an outstanding success. He has since made all his sails to this design. The only difference in handling was that the battens did not have positive batten stagger.

The first batten moved forward when lowered by 25cm, and then the other battens came down on top of it, being restrained from moving further forward by *Johanna's* short batten parrels. Arne solved this issue by fitting rubber hose extensions to the battens at the leech, to hold the sheetlets out, and by cutting 25cm off the after end of the boom and recutting the lower panel to suit. After this, he had no further problems with the sheets tangling.

With later sails, he has concentrated on making the after end of the battens finish flush with the leech, which has allowed him to do away with the rubber hoses. Shortening the foot of the sail at the clew has become a standard design feature, as have the short batten parrels that restrain the battens from moving forward. Others have reported similar issues with a lack of positive batten stagger in their Hasler/McLeod cambered sails, but this is easily remedied, either by Arne's method, or by fixed luff parrels like those fitted by Paul Fay.

A significant development in 2000 was the launch of another junk-rigged yacht in Stavanger, the ferro-cement schooner, *Samson*, with Arne-style cambered sails, 8% in the mainsail and 10% in the foresail. Victor Winterthun had earlier fitted a Reddish junk sail to his Albin Viggen, *Iris*, in the nearby island of Stord, and at last Arne was not the only junk sailor in Stavanger. This was the beginning of a trend. There were soon several boats in the area with Arne's version of the junk rig, including Ketil Greve's *Edmond Dantes*, and

later his blisteringly fast *Marie G*. It wasn't long before they began having regular rallies.

Johanna has alloy battens and an alloy yard, to reduce weight aloft. Arne fitted a winch for the halyard and a three part sheet to reduce the friction, allowing the sail to swing out freely when hoisting, discouraging it from drawing before he wished it to. He added an extra, low aspect-ratio keel in front of the fin keel, and brought the sail's centre of effort further aft, to reduce lee helm in light winds. This was partially caused by the mast being too short, which forced Arne to cant the fully-hoisted sail well forward. When the sail was reefed, he was able to cant it aft again, restoring balance. In later rig designs, he allowed more mast height.

After sailing the boat for a while, he decided he'd like more camber, so eased the lashings of each batten at the luff by 10cm. This added a few wrinkles to the sail but noticeably increased performance. A final touch was the purchase of a Winchrite electric winch handle, to assist in hoisting *Johanna's* 48sq metre sail.

In 2013, Arne decided he needed a smaller yacht, and converted the 6.5 metre Greif 650, *Frøken Sørensen*, to junk rig, increasing the sail area from 15 to 20 sq metres. The boat has no fixed ballast, having a centreboard for lateral resistance and a capsize angle of 83°. He'd already converted an open boat, the 18ft Oslo dinghy, *Broremann*, to junk rig, and realised he was having more fun sailing it than the large and powerful *Johanna*, being more inclined to go out at short notice for quick sails.



Samson - 2000



Broremann - 2011

The mast, on *Frøken Sørensen*, 7.6 metres long, is a hybrid, a 6 metre, 100 X 4mm aluminium tube with a timber extension at the top made from two spruce planks glued together. Despite the increased sail area, the new mast is considerably shorter than the old one, which improves stability.



Frøken Sørensen doing 6 knots - reefed

Yard and battens are also aluminium. The sail is made from Odyssey III and has 8% camber. Set up with Arne's usual throat-hauling parrel and Hong Kong parrels, the sail sets beautifully and performs well.

There is very little hardware in this rig; most things, including the halyard attachment point on the yard and the turning blocks at the base of the mast, are just lashed on. Bearing in mind the lack of ballast, Arne was pleased to discover that *Frøken Sørensen* stands up to her increased sail area and has a very satisfying performance. In light winds, the vessel is faster to windward than any boat Arne has yet met of similar size.

It has also proved to be an ideal daysailer, with a wide, comfortable cockpit, a cosy cuddy cabin and extremely light loads on all running gear. The sail is so easy to hoist that Arne is happy to pull it up and down several times a day. The deep rudder gives superb control at all times, even at low speeds, but with both rudder and centreboard up, the boat can go right into the shallows. This makes for relaxed, fun-filled daysails and picnics, and Arne has no trouble finding willing crew, many of whom are eager to return for another sail.

One innovation Arne has fitted is something he calls a Fan Up Preventer (FUP), a light line that goes from the leech of the top sheeted batten down to the clew, then forward to become something of a vang, before being brought aft again to the cockpit. Set up firmly, it inhibits the battens from fanning up, unless the boom also lifts, which the vanging effect of the system should discourage. A system like this may have prevented the loss of Bob Groves's *Easy Go* a couple of years ago, an event that inspired Arne to look for a solution to this issue.

It would be easy to assume Arne has found his ultimate boat in *Frøken Sørensen*. He was even

heard to declare that he didn't need another, before sheepishly admitting he'd bought one, a fibreglass Marieholm International Folkboat named *Ingeborg*. He wanted another keelboat, albeit smaller and



Ingeborg

lighter than *Johanna*.

He has designed a 35 sq metre sail for the boat, which he built during the winter months of 2014/15, recording the process in a 44-piece photo essay for aspiring amateur sailmakers, which can be found in his *JRA Member photo albums*, a very useful update on his earlier sailmaking essays.

In the summer of 2015, he made the mast partners and step for *Ingeborg*, but progress was slow because he was still having too much fun with *Frøken Sørensen*, in which he made 37 outings during the season, half of them alone.

The summer of 2016 should see *Ingeborg* sailing the waters around Stavanger, undoubtedly showing a clean pair of heels to a lot of other boats, while Arne effortlessly holds the tiller in one hand and a cup of coffee in the other, the quintessential cruiser,



Arne Contentedly helming - 2011

albeit one who likes to get there efficiently. With his enthusiasm and practical example, he has inspired a great many people to adopt the junk rig, or at least to treat it with respect, as he blithely sails past them.

Over the last 25 years or so, Arne has brought an independent and highly original mind to the design and construction of modern junk rigs. His willingness to contribute to the JRA knowledge base, and to share his triumphs and setbacks in a series of lucid articles, has been invaluable to other members of the Association.

This was later enhanced by the development of the JRA Website. Today, *Arne's Pages*, in the Technical Forum of the website, offer a wealth of information to anyone interested in developing and building a performance-oriented junk rig, with articles on rig types, designing the sail, sailmaking, building the mast and other topics. He has also been generous with personal assistance to others, including drawing detailed sailplans for other vessels, all freely given. His dedication and willingness to share his knowledge has made Arne one of the most influential and highly respected members of the junk rig community today.



Samson and Malena



Frøken Sørensen tacking against F4-5 with 3 panels up.



Johanna, YHP above sling point



Johanna sailing out of her berth with two panels in a F4



Arne type cambered junk sail - unknown vessel