

More spars, more stays, more string... and more, sometimes much more, expense. We asked Nick Newland, long an aficionado of that extra stick:

## What's the Point of Two Masts?

With illustrations by the author.

This article was provoked by a tailpiece in *Professional Boatbuilder* on the 'de-ketchification' of America, bemoaning the lack of such rigs in modern practice. In the past I have been much in favour of two masts but being aware of how technology has transformed many aspects of sails and sail handling, I wondered if a case for two sticks could still be made.

I am not going into the 'yawls v ketch' argument. A mizzen is a mizzen and only its size dictates where it rests in the yawl (small sail) v ketch (large sail) spectrum..

### The way we were...

Historically more than one mast was a necessity for a variety of reasons:

- **The handling limits of the crew:** Commercial vessels with small crews, like the trading ketches of Wales and the west country, needed lots of small sails and therefore more masts. The American multi-masted trading schooners were the logical end point of this process.
- **Materials:** Sails are highly stressed and this limits their size for any given material, so again more sails but smaller.
- **Reefing:** Lots of sails gave more ability to set the right amount of canvas to suit the conditions.

- **Lower capsize moment:** Long slim hulls cannot support tall rigs so the rig must be spread out lengthwise along the hull – and beyond with bowsprits and bumkins.

There are many other reasons such as riding to nets when fishing and rules for ocean racing which did not count the mizzen – or the mizzen staysail – as part of the measured sail area, thus creating a fashion for yawls.

### The way we are...

Without a doubt one single mast is the most efficient. In its modern format most of the above reasons for multiple masts no longer apply. Modern materials, for example, have re-written the rules for sails and masts and new techniques such as slab reefing and roller furling have transformed the handling of sails and enable sail area adjustments to be done at the drop of a shackle pin. Beamy hulls give the power to carry sail and modern hull design combined with taller rigs gives yachts a speed and weatherliness our ancestors could only dream about.

There are many snags to multi masts, not the least being the extra cost. They also mean a smaller cockpit, and compromises over the tiller arrangements as mizzen and tiller fight for the same space. To cap all the negatives, mizzens are



**Facing page:** *Small schooners were rare in the UK: this is the distinctive Swansea pilot boat; painting by Ken Tucker.*  
**Above:** *Swallow Boats Storm 17 with sprit boom.*

frequently denigrated for having little or no drive.

This little drive argument needs countering. Sheeting the mizzen is a problem. It has to stand with no twist if it is not to be backwinded by the main, so kicking straps and sheeting angles come into play. Mizzen are frequently loose-footed, and even worse, sheeted to the centreline. A loose-footed sail sheeted to the centre will not go to windward – just imagine what would happen if you sheeted your jib to the centreline. Off the wind things are not so bad but the mizzen still cups too much to get the drive its area is can provide.

The answer to sheeting the mizzen is either all the paraphernalia of kicking straps – meaning more expense and

more highly stressed components – or using the sprit boom invented by the fishermen of the Chesapeake Bay in the 1800s. The foot of the sail becomes its own kicking strap and the sheeting position is no longer as critical because of the effectiveness of this built-in kicker.

So the mizzen will drive the boat if properly designed but that still does not create an argument for two sticks.

## Confidence, comfort, compromise

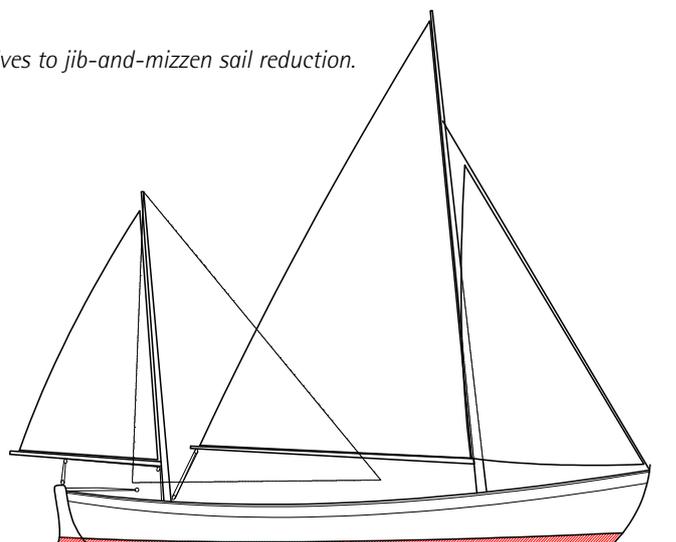
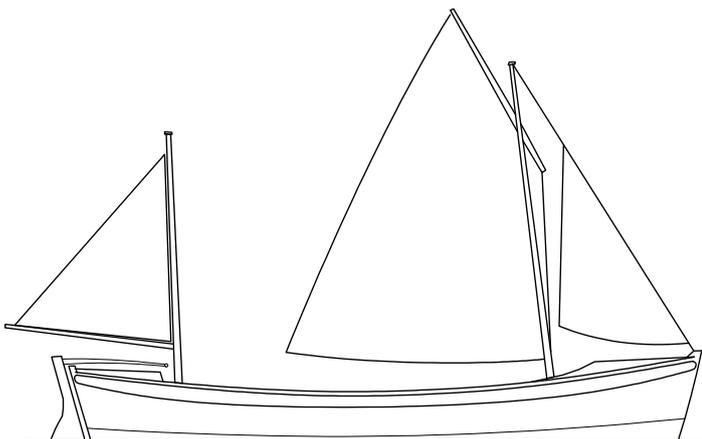
Before the days of powerful engines, craft built for extreme conditions had to be operated by the skills and sinews of men. Such boats were almost invariably rigged with a mizzen so that they could stand up to severe conditions under jib and mizzen alone if necessary. The RNLI lifeboat is typical, as is the Naval Whaler – both, by the way, had booms on the mizzen.

So if you need to feel confident under extreme conditions and do not want to rely on a powerful engine, there is something to be said for the jib-and-mizzen combination; both are efficient sails in their own right and in the two examples above, windage is also reduced by lowering the mainsail. So one argument for two masts might be: confidence in the face of bad weather.

Seakeeping and comfort at sea are qualities of a hull which are hard to define. The American naval architect Dave Gerr suggests one measure is the relationship between the weight of the vessel and the area of its waterplane. Large waterplane areas on beamy boats with light hulls result in rapid and uncomfortable motion. In his excellent reference book *The Nature of Boats*, he provides a curve of desirable Waterplane Area against Displacement. For a given weight the beamy hull has more power to carry sail but is uncomfortable at sea, while a narrower hull cannot support a lofty rig but gives a more comfortable motion at sea.

A good example of the compromise possible is the double ender *Juana Maria* designed by Manuel Campos, a naval architect who has produced some great world girdling yachts. Described by Juan Baader in *The Sailing Yacht*, this 4 ton yacht designed for the shallow waters of the River Plate between Argentina and Uruguay has a 31' waterline with an 8' beam and just 2' draft (9.4 x 2.4 x 0.6m) and comes inside the comfort zone defined by Gerr.

*The yawl rigs of the RNLI lifeboat, and Juana Maria lend themselves to jib-and-mizzen sail reduction.*





Above: A 'joyous and relaxed sail' on Swallow Boats' Bay Cruiser 23  
 Below: An effective mizzen sheet arrangement on a SeaRaider.

However, the rig is very low. By increasing the beam to 10' (3m) to give a typical modern length-to-beam ratio of 3.3 but keeping the weight the same, the hull righting moment – its power to carry sail – is approximately doubled but the hull response is now outside the comfort zone. Length to beam ratios of up to 4 or 5 are not uncommon nowadays, pushing the hull response even further away from the comfort zone. So two masts are helpful in achieving a balance between comfort and all out performance.

What else can an extra mast offer? An owner of one of our ketch-rigged Bay Cruiser 23s has this to say:

*Leaving a crowded mooring in gusting Force 6 on jib and mizzen alone, we quickly accelerated on a beam reach. Amazed at the instant reassuring and sedate control I had over Loulabelle, I pointed to windward and began to tack through the moorings, making up to 5 knots on each short tack. In what would have otherwise certainly been testing conditions, the rig allowed a joyous and relaxed sail.*

Sailing astern to clear a mud bank:

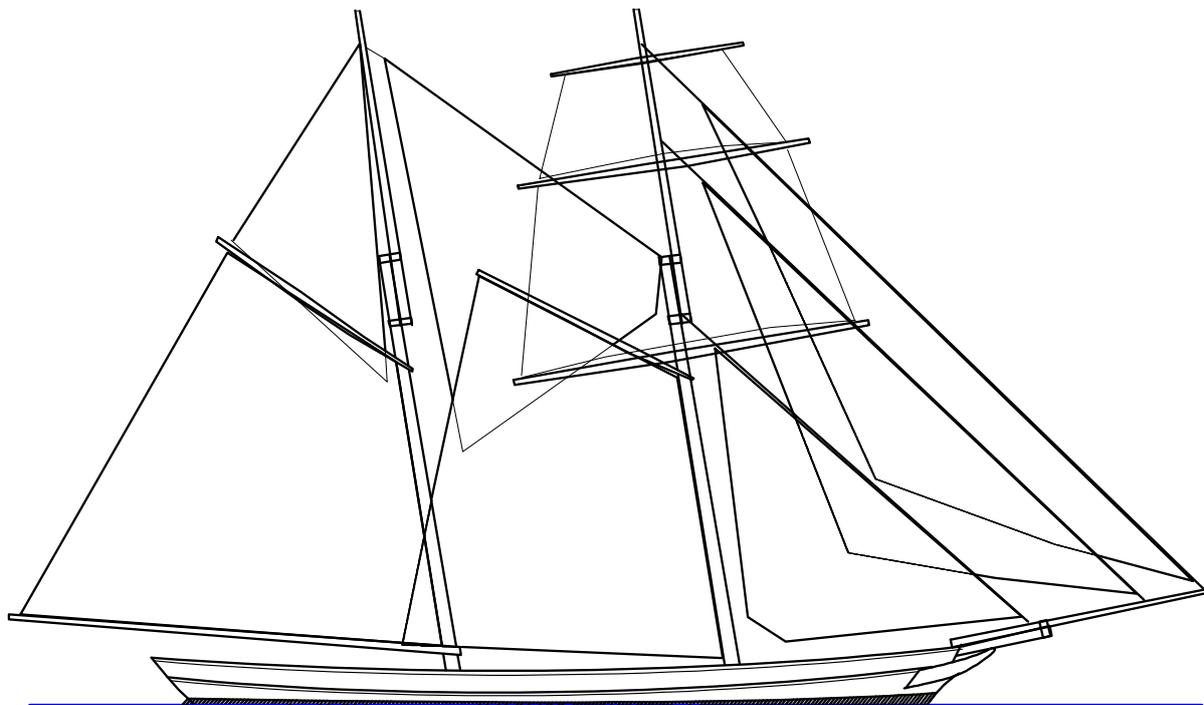
*We furled the headsail, pulled up the centreboard and grabbing the mizzen sheet on the outer side of the boom, put the boat into reverse using the mizzen to sail downwind off of the mud.*

And a few more tricks:

*Sailing on a beam reach with mizzen alone is useful for picking up moorings. At night, sailing downwind on mizzen alone in confined channels at low water gives clearer visibility with the headsail furled. At sea, heaving-to is straightforward.*

One might add a mizzen is also most helpful in stopping that maddening sailing round your mooring when the breeze pipes up and thus reduces the load on the anchor. So confidence in tricky situations is a feature of the rig.





I accept that there is a penalty to pay in cost and performance but I would argue that the ketch rig gives you a combination of hull and sail that is more comfortable at sea and at anchor and gives you confidence in facing the weather and those tricky conditions often encountered in today's crowded anchorages. So two sticks still get my vote.

### 'See how she schoons!'

Most of the advantages I've listed do not apply to schooners: there's no dropping the main to schmooze in on jib and mizzen, no mizzen to hold her head to the wind and with two large masts, even more cost. They are not as weatherly as a ketch for the simple reason that the sails being closer together interfere more with each other.

The excuse for schooners is romance. Many years ago we had just returned to HQ for a pint after a morning lifting crab pots when a little black-hulled schooner caught our eye storming through a 5 knot ebb at the narrow entrance to the estuary. As she drew level with the salt marsh opening, her helm went over and she shot into the salt marsh and anchored in what seemed like minutes. The rig held our attention; the seamanship our admiration.

Robert Louis Stevenson caught my feelings for a schooner perfectly: "The only noble thing a man can do

with money is to build a schooner.". Certainly if you want to get noticed, get a schooner. Who can resist the lines of the low hull of the revenue cutter *Joe Lane*, shown in Chapelle's *History of American Sailing Ships*? Though at 100' (30m) on the waterline she's not within most budgets, Bill Garden's *Toadstool* – see *Garden's Yacht Designs, Revised and Expanded* – with her long main boom, traditional loose-footed 'tow foresail' and large single headsail with club boom, still retains the romantic lines of a schooner at just 29' (8.8m) overall.

So what's the point of two masts? Simple: confidence to face bad weather; confidence in tight situations; comfort at sea and at anchor; and romance... if she's a schooner!

*The 100' (30m) schooner Joe Lane, above, would certainly get you noticed. As would Bill Garden's diminutive but still eye-catching Toadstool.*

