

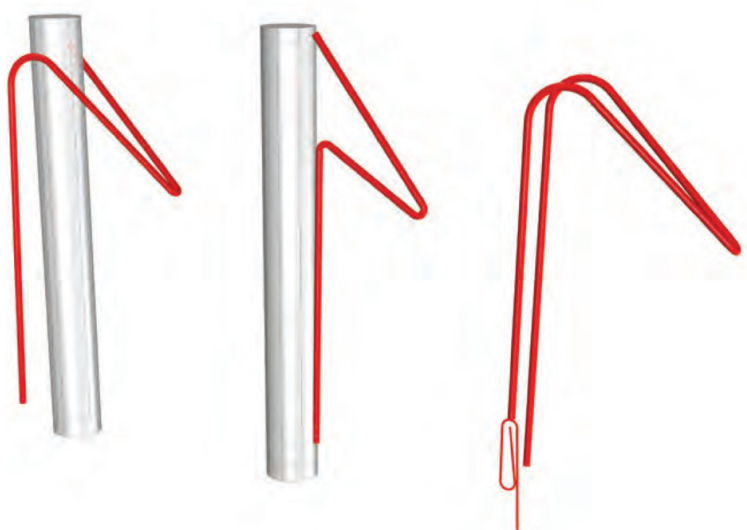


Part 34: Looking Forwards

Moray MacPhail's series on refining traditional rigs reaches hoisting and sheeting the headsails.

Sails in front of the mast this time. I'm not sure it matters how you hoist them as long as you get the luff tight and I can't think of a boat small enough – or slow enough – where a single part halyard would be sufficient. Winches work but there's no reason why tackles can't have the same effect.

My diagram right shows two ways of getting a 2:1 purchase, with a twist. Or rather without a twist, because if you use a single-with-becket block on the mast and a single on the sail, then the halyard tends to twist together, sometimes preventing the lowering of the sail. This is especially the case with 3-strand rope and it's not a problem you can fix from the deck. However if you keep the parts of the halyard separate, horizontally or vertically – or both – then as the sail reaches



Ways to prevent twist in the jib halyard: Left – Attach one part to one side of the mast with the other on the other. Middle: Separate the parts vertically. Right: More purchase without needing miles of rope with a double ended halyard; plain on one end, with a tackle on the other. Here a 2:1 but 4:1 or 6:1 is possible.

its full height and tension comes on, the increasing angle of the V formed by the separation of the parts of the halyard helps prevent them twisting together. This is particularly important if you are also using furling gear.

One way around that is to have a single part halyard, with a hardener – typically 2:1 or 4:1 – at the lower end. On the right is an old-school take on the modern style of coarse/fine controls – one end of the halyard is 2:1; the other with a hardener added is 4:1. This gets you plenty of power without needing miles of rope. Another way is using a Highfield type tensioner, as shown right.

Sheeting

How much load is there going to be on the sheet? For ease of reference I have repeated below the formula offered last time.

Assuming a 'normal' windspeed of 15 knots, the maximum sheet load works out as roughly 11lb per square foot (5kg per m²) of foresail area. From that we can deduce that if we want to keep the sheet to hand, we are limited to a sail of about 35 sq.ft (3.25 m²) before cleats or other friction adding devices like snubbing winches or ratchet blocks come into play. A sail of 70 sq.ft (6.5m²) or more will need assistance by tackles or winches to trim when under load.

As far as jibsheet sizing goes, the loads we are talking about are trivial in terms of the strength of rope – see W164 – so we can choose on the basis of comfort rather than strength on all but the raciest of craft. For me, I reckon 5/16" (8mm) diameter rope is the minimum, with 3/8" (10mm) preferred. Sore hands do not make for happy family sailing, so anything you can do here will pay dividends. If you need a winch, self-tailing winches only really like braided rope and will only accept a limited range of diameters.

In smaller craft, should the jibsheet cleats be to windward or leeward? The



The Highfield Tensioner, much used in dinghies is an over-centre device, shown here tight (above) and loose (below). It works well on a wire halyard incorporating an eye.

windward side has the advantage that when crewed, they are easy to use, and don't disappear into the leeward bilge at every opportunity. The snag is when you are sailing on your own you may need to lean awkwardly outboard to cleat the sheet. After being a windward cleat devotee for many years, I fitted leeward jibsheet cleats on the Orwell. I reckoned I'd be short handed sometimes and as it's a keelboat I can do a quick dive to leeward without too much drama. It also simplified the deck layout. Nonetheless, when I'm single handed I either use a Velcro patch on my knees to hold the tail end of the jibsheet or I will tie the two sheets together to form a loop.

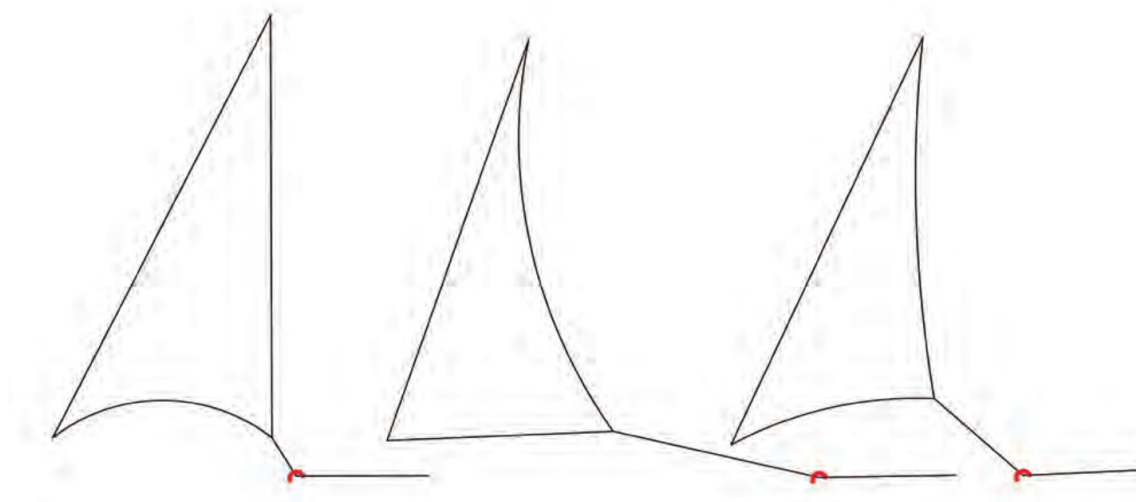
More difficult is where the fairlead should go. A rule of thumb is that

the fairlead-to-foresail tack line should be 12°-15° off the centreline. Practical constraints tend to influence the choice, however. For genoa-type sails or tow staysails with a long foot, there may simply not be enough boat behind them to provide that angle. Even if there is, other items such as guardrails and shrouds may get in the way. Some craft have the shroud plates inboard to provide a wider sheeting base for the foresail, which is fine so long as it is properly engineered.

For most cruising craft however, we are stuck with threading the foresail sheets through the various obstacles on deck to wherever we can put them. On smaller – and usually broader beamed – craft like dinghies and dayboats, wider sheeting bases

HEADSAIL SHEET FORMULA: $SL = SA \times V^2 \times F$

Item	Description	Units (English)	Units (Metric)
SL	Sheet Load	Pound	kg
SA	Sail Area	Square Feet	Square Metres
V	Wind Speed	Knots	Knots
F	Factor	0.00431	0.02104



Jib fairlead positions – Left: *The fairlead is far too forward; the sail foot is slack. Middle: Fairlead to far aft; the leech is slack. Right: Correct; tensions on foot and leech equal. Below: The fairlead's position sideways adjusted using an aluminium bullseye.*

are often available and you will see angles at the higher end of the range. In the '30s it was fashionable to fit outriggers to extend the foresail base beyond the beam of the boat but this is not seen these days because boats are beamier – and they must have been a real pain in practice!

Where should the leads be fore and aft? If you can, don't fit the fairleads until you can set up the rig and see where they should go by observing the foot and leech tension.

Of course, this all becomes irrelevant if you have adjustable

tracks, though I think these a waste of space – and money! – unless you have a low cut foresail fitted with roller reefing. Then the fairlead position moves as the sail is furled or you set a variety of sails on the same stay, each of which has its own fairlead position.

This applies to close-winded work. The further off the wind you go, the wider the sheeting angle should be, probably up to about 20°. The easy fix here is with barber haulers or 'lizards' – bullseyes or thimbles spliced into the end of a line – arranged to haul the jibsheet outboard.

Those aluminium bullseyes which I described in W165 and shown below will serve well.

Reefing v Furling Gears

It may be worth considering the two generic approaches open to you for reducing headsail area. The first and more common on modern rigs, is to use reefing gear, which allows you to vary the amount of sail set from the full sail to nothing depending on conditions.

Almost all of these systems use an aluminium extrusion through which the forestay passes and into which the headsail boltrope is fed. The sail is reefed by turning the extrusion using a drum at its lower end, so even if it jams or snarls up, there is still a stay supporting the mast. The rigidity of the reefing gear's extrusion means if you set a headsail on a traveller or to the end of a reefing bowsprit, your best choice is furling gear. These work on the basis of a top and bottom swivel attached directly to the head and tack respectively of the sail. Two examples are shown across the page.

The luff wire transmits the torque from the lower swivel to the upper, so if you are fitting a furling gear to





Furling gears: A century apart, both the Harken gear – left – and the Wykeham-Martin Gear – right – work on the same principle. Below: Nigel Irens' modern lugger *Roxane*; Andrew Wolstenholme's trailer sailer for today *Kite*; Sam Doman's *Raedwald* fast dinghy.

a sail for the first time, it is not just a question of removing the hanks. Check with a sailmaker that the luff wire is going to be stiff enough to work. If not the lower part of the sail will furl leaving a baggy mess higher up. In 'demanding' conditions, this upper part will shred, so wrecking the sail. You don't get a consistent sail shape in a part-furled condition; with furling gears, it's all the sail or none of it. I also hear of cunning schemes to make furling gears work as reefing gears with a double luff wire or an extrusion. I am not persuaded.

Boomed foresails

Why not just have a foresail set on a boom, which is both self-tacking and leaves a relatively lightly loaded sheet to control? It can be attached to the forestay. We sometimes made an extension to the rigging screw or a collar around it for the end of the boom. It works fine but can foul the pulpit.. Alternatively – and I think preferably – a pivot some way aft of the forestay, perhaps on its own pedestal or bitts if fitted, naturally gives the sail a bit more shape as the sheet is eased. That said, I still dislike

the boom's impact on the foredeck arrangements.

Valediction

I think we have finally arrived at the end of this series. In it, I have examined ways to keep traditional rigs relevant by understanding how they worked and can work better using modern materials – including my own boats *First of April* and *May* which have very different purposes and approaches. It's not just me, though; as these pictures show. Tradition is not static – it evolves.

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Photo: Kathy Mansfield



Photo: Peter Chesworth



Photo: Modern Classic Boats