The SHOCK of the OLD

Part 11: THE EYES HAVE IT

But not all the time. Having discussed wire types and their uses in W152, Moray MacPhail offers ways to bring them to a useful conclusion.

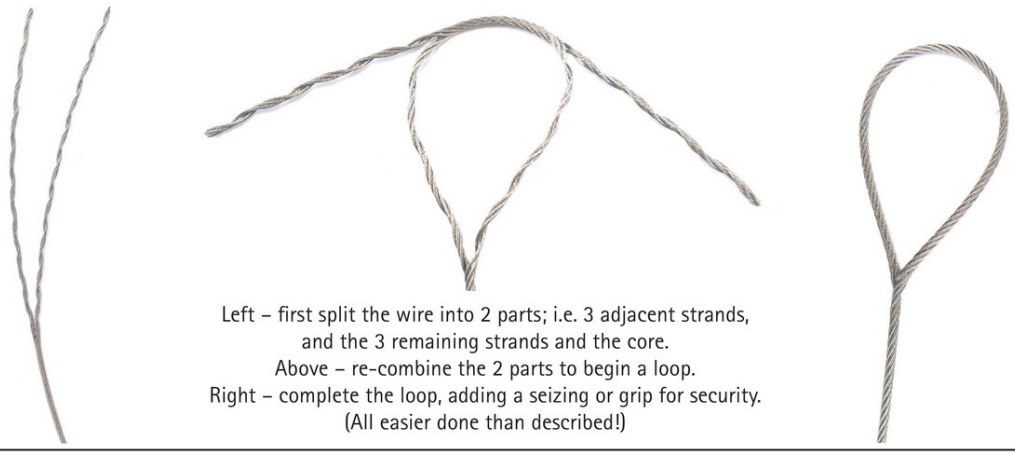
Having chosen our wire type and size, we need to transfer loads onto it. Various types of end have evolved, which can be grouped into 'made-up' and 'add-on' terminals. The made-up ones involve forming an eye in the wire, and so include hand splices, wire rope grip splices, and ferrule splices.

Spliced Terminals

It is outside the scope of this article to give a full description of hand splicing wire and anyway, Brian Toss in The Rigger's Handbook has described it much better than I ever could. But for bodgers like me the Farmer's splice – also I think called a Molly Hogan splice? – deserves a wider airing since it can be done quickly without tools or fittings, and could be a good get-you-home technique.

What happens is that you split 7×7 wire along its length into 2 parts, one has the core and 3 adjacent strands; the other the remaining 3 strands. You then fold these back on themselves and combine the 2 parts to remake the wire into a loop which we boaty types like to call an eye. You have the option of making the eye the exact length of the parts you have split and then seizing or binding that bit, or leaving a long tail which can then be seized or bound to the standing part. The seizings can be made from twine or wire or wire rope grips; they simply help prevent the splice wriggling apart, which left to its own devices it could do. Figure 1 shows the process.

Figure 1 Farmer's (or Molly Hogan) splice in 7×7 wire



Left – first split the wire into 2 parts; i.e. 3 adjacent strands, and the 3 remaining strands and the core.
Above – re-combine the 2 parts to begin a loop.
Right – complete the loop, adding a seizing or grip for security.
(All easier done than described!)

Figure 2 HMPE eye splice when you have access to both ends of the line

1. Pass the short end through the standing part

2. Pass the standing part through the tail

3. It forms a figure of eight

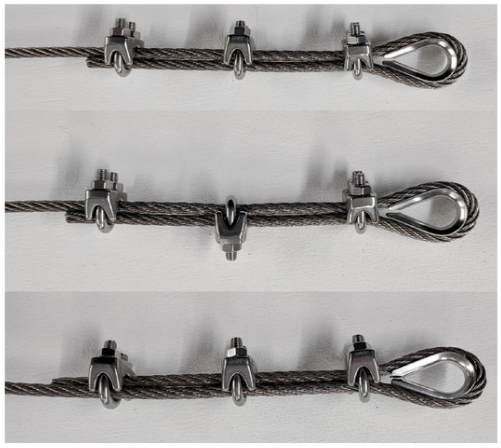
4. Draw the parts together to lock the loop

While we are on the subject of quick rigging, I mentioned last time that carrying a length of HMPE – High Modulus Polyethylene – as emergency rigging could be a good plan. You can see from Figure 2 that making a loop in HMPE is straightforward if you have a hollow fid or a redundant gouge on which to grind a point.

Bulldog Grip Terminals

Moving on to the use of wire rope grips, they may not give the tidiest splice but make one which is quite satisfactory so long as you put three grips on the right way round. Figure 3 shows the right and wrong way to do it. This method has the advantage that you can make up a splice in situ with simple tools, and if you don't have grips it may be possible to use wire seizings to the same effect.

Figure 3 Making an eye using Bulldog grips (wire rope grips)



Correct - nuts on standing part

Wrong - clips staggered

Wrong - clip inverted

Ferrule Terminals

Instead of using grips, eyes can be made by compressing tubes called ferrules onto the wire to form an eye. Talurit and Nicopress are two trade names. This is a very effective way of terminating wire, so long as the splice is correctly made. Nicopress terminals can be made by a hand tool which looks a bit like a large set of bolt croppers, as in Figure 4. This system tends to be used for wire rope up to 6mm (¼"); the hand tools being usually limited to 4mm (3/16").

The Talurit system uses hydraulic presses, the smallest of which generates up to 20 tonnes and can cope with wire of up to 8mm (5/16")diameter, but the

Figure 4 Nicopress terminal system

Left - the tool for compressing the ferrules

Below - a spliced eye

range goes up to more than 100mm (4"). diameter capacity.

You see tools offered occasionally which purport to let you do your own crimp splices by bringing two bits of steel together using wing nuts to compress the ferrule. I wouldn't if I were you.

With a Talurit splice, you should check that the choice of materials is correct – for stainless wire, use copper ferrules and stainless thimbles; for galvanised, aluminium ferrules and ideally galvanised thimbles. The snag is that most thimbles offered as galvanised are actually electroplated zinc which tends to have a short life in a marine environment, so you may have to use stainless thimbles on galvanised wire. If that is the case, do check for signs of rust around the thimble which indicate that the galvanised wire is corroding. I once had the embarrassing task of returning a borrowed Wayfarer dinghy with a very bent mast after failing to check this.

In a good splice the ferrule should not be jammed up against the thimble; a millimetre or two clearance is better. As well as that, the free end of the wire should be just visible in the ferrule once the splice is made up. Any longer and the press can't close fully and you get nasty straggly ends which need binding. Any shorter and the splice is not as strong as it could be.

Finally, don't attempt to use this system on old or dirty wire, because the strength of the splice depends on the material of the ferrule being squeezed into the gaps between the strands of the wire. If those spaces are full of crud, varnish or corrosion then the ferrule won't get such a good grip.

Add-On Terminals

These avoid the need to bend the wire. The options include poured sockets, swaged or swageless terminals. I have to confess that I have not seen a poured socket used on a boat's rigging for at least 40 years, though they are still used industrially. So I'm going to move on.

Swaged terminals – with fork, eye or stud endings – are effectively a tube which fits over the wire and is then squeezed on by a rolling press. This is probably the most widely used method on modern boats. It has two main

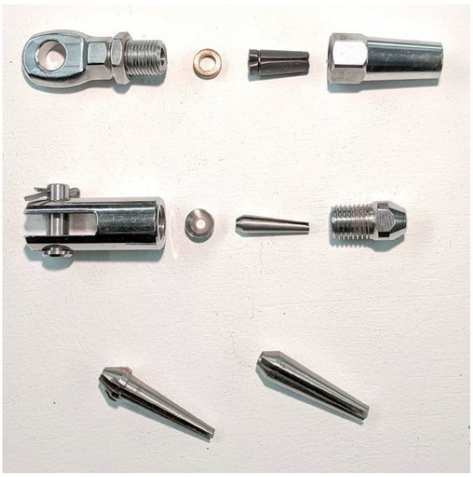
Figure 5 Talurit splicing system

Left - spliced eyes in:

- galvanised wire using aluminium ferrule
- stainless wire using copper ferrule

Below -Talurit machines, ancient (mine) and modern

Figure 6 Some Swageless Systems



From the top:

- Blue Wave Eye terminal. Here the cone is in 3 parts which grip the outside of the wire, a bit like the jaws of a drill chuck. The system works for all wire types.
- Sta-Lok Fork Terminal. In this case the cone used varies with the type of wire, because it goes inside the outer strands of the wire.
- The castellated cone on the left is for 7-strand constructions, the smooth cone on the right for 1×19 wire.

drawbacks. Firstly, though not often done, an inexperienced operator may over-compress the terminal which will lead to cracking of the sleeve.

Secondly, an unprotected terminal of this type at the lower end of a stay can create a perfect starting point for corrosion if sea-water enters and stagnates. At the upper end of the stay where the environment is less hostile such endings are fine. I know that there must be a great many swaged terminals sailing around at the lower end of stays, but they have the potential to be unreliable which is probably why insurance companies insist on renewal every 10 years or so.

If you don't want, or can't have, a splice, then swageless terminals can provide a solution as shown in Figure 6. These are the cone type fittings - Sta-lok, Blue Wave and Norseman are some trade names – and they have the advantage that although expensive, they do not require special tools for fitting. A couple of spanners, sealant and thread locking fluid will suffice. You can also re-use them on new wires and because the terminals are filled with insulating sealant, rather than nasty electrolytic sea-water, corrosion problems are minimised.

I have summarised all the various options in the table below.

Having put ends on to the wire, next time we'll connect it to the hull or spars.

Table 1 Summary of various methods of termination

	Type of end	Stainless 1×19	Stainless 7×7 or 7×19	Galvanised Usually 7×7	HMPE
Hand splice	Eye	Good luck	yes	yes	yes
Bull-Dog Grip	Eye	yes up to 6mm	yes	yes	na
Talurit Splice	Eye	yes up to 6mm	yes	yes	na
Poured Socket	Fork or eye	no	no	yes	na
Swageless	Fork, eye or stud	yes	yes	Some types	yes
Swaged	Fork, eye or stud	yes	yes	no	na

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