



The SHOCK of the OLD

Part 22: On and Around the Block

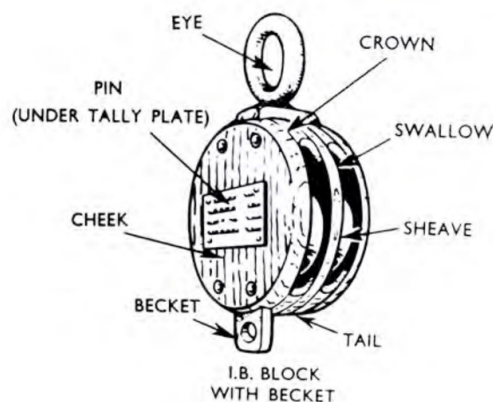
Just remember we never call them pulleys, writes Moray MacPhail

So far we've looked at rope types and usage in the past two articles, now for blocks and in the next article tackles.

It is mostly traditional stuff – at least as far as arrangements and configurations go. As well as the books I listed in W163, an interesting source of information is the *Admiralty Manual of Seamanship* – published by HMSO in various editions; mine is from 1964. Inevitably there is much stuff about the conduct of warships and the duties of the Officer of the Day but there is also a great deal on ropework and seamanship skills, culled from generations of experience.

I hope this doesn't all seem a bit basic but having been on

the receiving end of a telephone in a chandlery for about 30 years, I got the sense that many people become a tad confused when it comes to blocks, tackles and their arrangements. So I thought I'd take a step back and start at the beginning. I won't be offended if you skip a bit.



The naming of the parts.

The main element of the block is the **SHELL** or body, the length of which – excluding the binding – is traditionally used to specify the size of the block. Inside that is the **SHEAVE**, which is grooved to take the rope or wire. The sheave runs on a **PIN**, and sometimes also on a bush or bearing. Except on a strop block, of which more later, a metal **BINDING** holds the whole thing together. Sometimes this may be extended beyond the shell to form a **BECKET**. The top of the block – where the eye or hook is – is called the **CROWN**, the other end is the **TAIL**. The sides of the shell are the **CHEEKS**, and the opening through which the rope passes is the **SWALLOW**.

Materials used in blocks

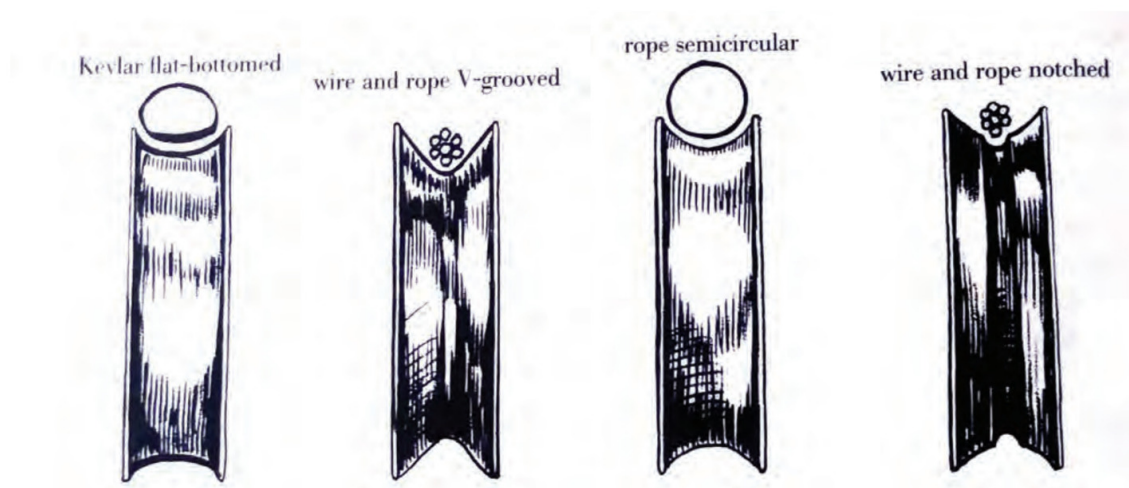
The shell may be made from wood – elm, teak and ash being common choices – but other common materials include plastics and various metals. Some very high tech stuff is also used but I'm going to concentrate here on blocks that might be used in traditional boats.

Which of course includes Tufnol. Invented back in the 1920s, Tufnol is a material made from layers of fabric or synthetic paper, hot pressed together using phenolic resin; in fact the trade name is a contraction of 'tough phenol'. It produces a block that is brown in colour, quite pleasingly traditional in appearance

and relatively maintenance free.

The binding, which is the load bearing part of the block, is commonly fashioned from metal; galvanised steel, stainless steel and one of the higher strength bronzes being the usual choice. There are many permutations in the end of the binding including oval eye inline, oval

Block Configurations			
<i>Confusion quite often reigns over possible block geometry, so a few words of explanation might help here.</i> <i>With blocks, the 'number' – single, double, treble and so on – refers to the number of sheaves – pulley wheels, if you really must!</i> <i>If the binding – in these cases the metal bit – extends past the shell of the block, it forms a 'becket' to which you can attach the end of the rope. That gives you the basic variations: double, single & becket.</i> <i>Exceptions? Of course, there are.! A fiddle or violin block – so named because of the shape – is a double with the sheaves in line as opposed to side by side. The rope tends to lay better but the blocks do take up more space.</i> <i>Strop blocks – of which the jibsheet block shell on the left is an example – have no metal binding, but use a rope grommet like the single strop – without becket – on the right.</i> <i>Block photographs courtesy Classic Marine.</i>		Plain	With becket
	Single		
	Double		
	Fiddle		
	Stropped		



eye across, swivel oval, swivel hook and bow end.

Generally speaking it is better to go for one of the non-swivelling versions if the arrangements permit, since it is difficult to engineer a swivel binding to full strength. In any event, there are occasions where a swivel end combined with the natural tendency of 3-strand rope to twist under load, can create an inconveniently remote snarl up.

Instead of bindings, strop blocks use a grommet of wire or rope incorporating a thimble at the crown, and if a becket is required, one at the tail. This makes for a light, quiet – the rope acts as a sort of fender – and elegant block. Both Brion Toss and Hervey Smith rate these highly.

Strop blocks do not have to be old fashioned; for some years Harken have produced a soft attach roller bearing block with a soft shackle binding. I have used an earlier version of these on my boat's mainsheet to good effect.

Sheaves

Sheaves are made from a variety of materials. In metals, aluminium, galvanised steel and bronze are often used and this is often thought to be the best way to do it. I'm not a fan of metal sheaves. Except for wire rope where the surface hardness is critical, plastic is preferable because of its

Sheave Bearing Selection			
Material	Load Amount	Continuous Load	Running Load
Acetal/Delrin	Light	OK as is	OK as is
	Heavy	Bronze bush*	Ball/Roller bearings
Tufnol	Light	OK as is	OK as is
	Heavy	Bronze Bush*	OK as is
Bronze	Light	OK as is	OK as is
	Heavy	OK as is**	OK as is**
Galvanised	All	Bronze bush***	Bush or Bearings
Aluminium	All	Bronze bush***	Bush or Bearings
Notes			
* bronze bushes are either plain bronze or oil-filled sintered bronze, Oilite is one trade name			
** depending on the alloy. Gunmetal and phosphor bronze are quite good at self-lubricating on a stainless pin.			
*** both alloy and galvanised sheaves can corrode onto a stainless pin, and a stainless bush can spall, so bronze is generally preferred			



lightness. Nylon is not a good choice because it can distort under load, wear quickly and also has a tendency to swell if damp, sometimes jamming the block. Better choices are Acetal, Delrin and our old friend Tufnol which also makes a comeback in Barton's 'Tufnol' range across the page.

An important aspect of sheaves is the shape of the score or groove which needs to be different for traditional rope, wire rope and modern composite ropes. The drawings across the page from the rigging manual show the differences. If you have a notched wire and rope sheave and then convert to an all rope halyard, it will chafe like mad on the edges of the notch.

Bearings are used between the sheave and the pin, either to overcome material deficiencies, like the softness of plastics or corrosion in metal, or to reduce rolling friction. There is no one size fits all answer, the solution varying with the amount

of load, the type of load and the material of the sheave. I've tried to summarise this on the table

Sizing

The old rule of thumb was 3" (75mm) of shell per 1" (25mm) of circumference of rope, which would give a ratio of about 5 or 6 of sheave diameter to rope diameter. However modern rope is much stronger than its traditional counterpart. So we either select blocks on the basis of strength to match the rope in which case the block is likely to be oversized, which is no bad thing. Or as discussed last time, we choose a rope which is comfortable to handle – or which fits the winches etc – and match the block to it as long as the strength of the block itself can cope with the envisaged loads.

In any event it is important to think about the size of the sheaves in relation to the size of the rope. You should use about 6 times the

diameter of the rope for polyester ropes, 10 times for high modulus ropes and at least 12 and ideally 20 times the diameter for wire. We'll look at this in more detail in the next article but before we do, let me introduce bullseyes.

Re-inventing the bullseye

A supplier once asked me why these round things are called bullseyes, because they look nothing like them. I had no answer then and have none now. But the traditional item once made from lignum vitae and often used as a lead, has been re-worked in hardened aluminium to create a very light and smooth fairlead which has been widely adopted as a kind of block, though Holt Marine calls them low friction thimbles – below.

As I mentioned in W156, they are lighter, cheaper and simpler than conventional blocks. But are they any good? We shall see next time.

www.moraymacphail.com

