

What's In an 'A' Frame

As the first reference point for our members here in the Norfolk Broads area, by far and away our most common enquiry is 'A Frames', what are they? how do they work? and where can I get one?

I will try to answer the first two parts of this question with some simple explanations and some basic photographs, the third part is less easy to deal with as with the demise of so many working boatyards on the Broads it is getting increasingly difficult to get work done or to obtain the necessary parts for D.I.Y. At present we are considering trying to find a boatyard to undertake this work, in return we will make them our only recommended supplier, but this is still in the discussion stage.



Fig 1: Shows A frame tackle secured to an eye bolt in the anchor locker which was screwed into the stiffener piece which is moulded in the bow of the Leisure 20.

The sole purpose of an A frame is to assist in the raising and lowering of the mast which is something anyone who sails on inland waters has to do occasionally otherwise the bridges tend to get in the way! this same equipment is also useful for trailer sailors.

It is called an A frame because it resembles a capital letter A, the apex of the A is attached to the stem head fitting by either a clevis pin or a cross bolt and on its topside it carries the forestay fitting, lower down it requires an attachment for a

block and tackle to assist in the operation. The bottom of the A frame legs need to be attached to the deck with robust pivot points as they do take a considerable load, it is advantageous to have the pivots as near in line with the mast heel fitting as is possi-

ble so that when lowering it keeps the forestay at a more or less constant angle, anyone who has tried lowering masts on the forestay alone will know that as the angle between forestay and mast decreases, mechanical advantage goes out of the window with often disastrous results!

The other problem that has to be tackled is side ways swinging of the mast as it nears deck level, if this is not controlled the leverage it generates at the hinge point of the mast to deck heel fitting is enormous, I have never tried to calculate the leverage but it is capable of ripping the heel plate out of the deck. To overcome this it is advisable to keep some tension on the cap shrouds, but with a cabin top mast and chain plates on the coaming there is a problem so, to rectify this, a system of triangulated shroud bars has evolved which brings the bottom pivot of the cap shroud bottle screws in line with the mast pivot, this means shortening the cap shrouds but the strength is more than compensated for by the stainless steel shroud bars.



Fig 2: Moment of lowering the mast - you can see the tension retained on the cap shrouds.

I hope the photographs will help to explain how it all works.



Fig 4: Mast lowered and resting in mast crutch at the stern (this crutch is a permanent structure on our boat).



Fig 5: Shows triangulated shroud bars which bring the pivot point for the cap shroud in line with the pivot of the mast.



Fig 6: Shows the small self tailing winch on the cabin to, (already on the boat when purchased!) which we use to raise and lower and gives complete control during the operation - this is not compulsory as there is enough advantage in the lowering tackle but it does enable both of us to stand in the cockpit and allows us to stop and start the movement of the mast at any point - it also makes the whole business a one handed operation if need be!

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