

The Junk Rig

(the westernised version, as developed by Blondie Hasler in the UK, and by Tom Colvin in the US)

The two pioneers who did most to bring the junk rig to the attention of the sailing public. Blondie sailed "Jester" in the first single-handed transatlantic race, and Tom has designed a range of functional junk rigged yachts and cargo vessels.



One of the best known of junk rigged boats, thanks to Annie Hill's book "Voyaging on a small income"

She has sailed more than 100,000 miles in the North and South Atlantic, from Greenland to the South Orkney Islands. She is one of Jay Benford's sailing dory designs. Everything was home-made, on a very limited budget

"Badger", in Greenland

What is it?

- A rig derived from the rigs used in China, and adapted for use on modern yachts
- It may have a stayed or un-stayed mast(s), but an unstayed mast is usually preferred
- It always has stiff battens, most of which are controlled by a sheeting system which permits control over reefing and sail shape.
- Stresses are widely distributed, and are much lower than in the bermudan rig
- It usually has a yard at an angle of between 20 and 70 degrees to the horizontal

What does it do well?

• Reefing (on any point of sail) is a simple matter of easing the halyard and trimming the sheet and the other control lines

15 seconds for the first reef

• Furling (on any point of sail) is a simple matter of letting go the halyard, when the sail is gathered into the topping lifts

Failsafe

• Tacking is a simple matter of putting the helm over - no sheets to handle

No flogging

• Gybing is easy, quiet and safe

No dramas

• When the sheet is eased, the sail is quiet and docile

No flogging

• Speed can easily be controlled by easing sheets and/or reefing, when approaching harbour

No dramas, again

• Performance downwind is superior to bermudan rig

• Less heeling, easier motion

What does it do badly?

• A flat junk sail does not have the drive of a cambered sail, and performance to windward in light breezes is poor, when compared to that of a bermudan boat with a genoa

• Nothing else

So why doesn't the modern yachtsman use the junk rig, when he seems to prefer motoring to windward? Innate conservatism, and an unwillingness to stand out from the crowd, perhaps?

How can the windward performance be improved?

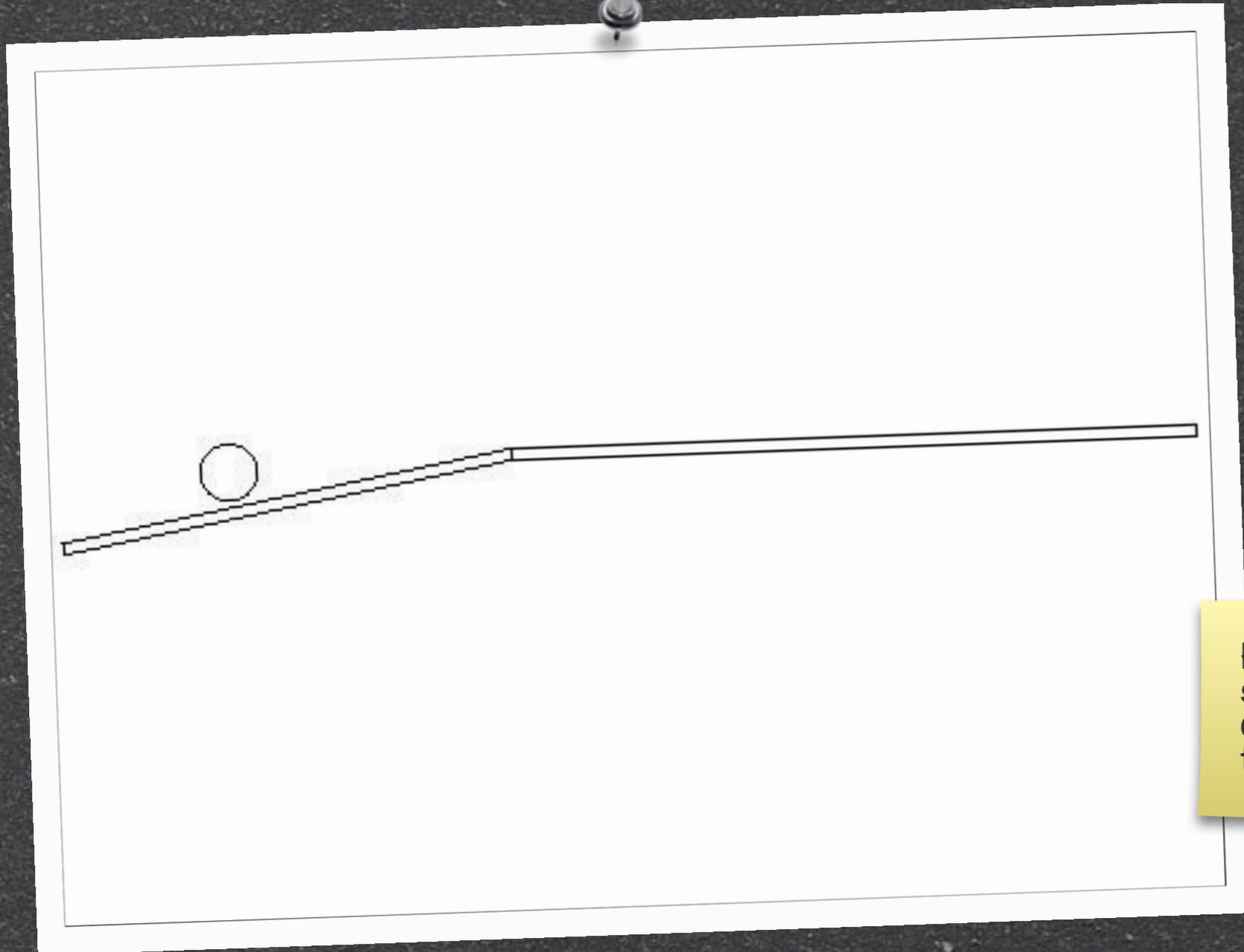
- By adding camber - obvious, really

In strong and variable winds, a junk rigged yacht can make safely and comfortably to windward when a bermudan rigged yacht is finding the going too difficult



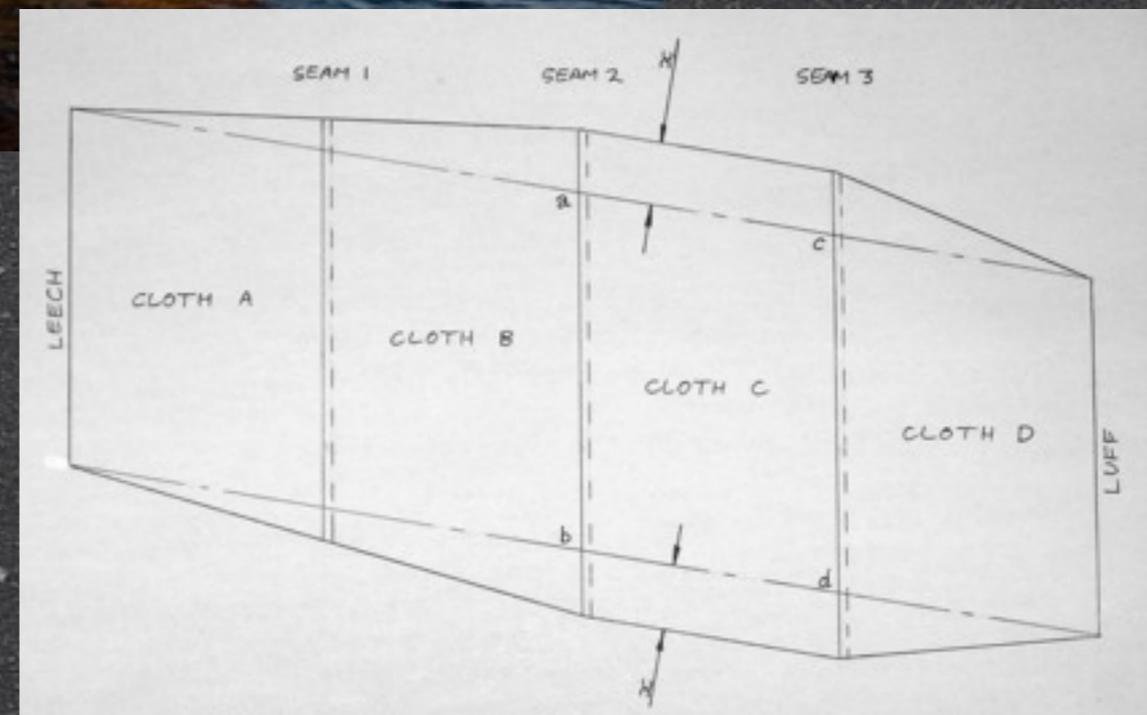
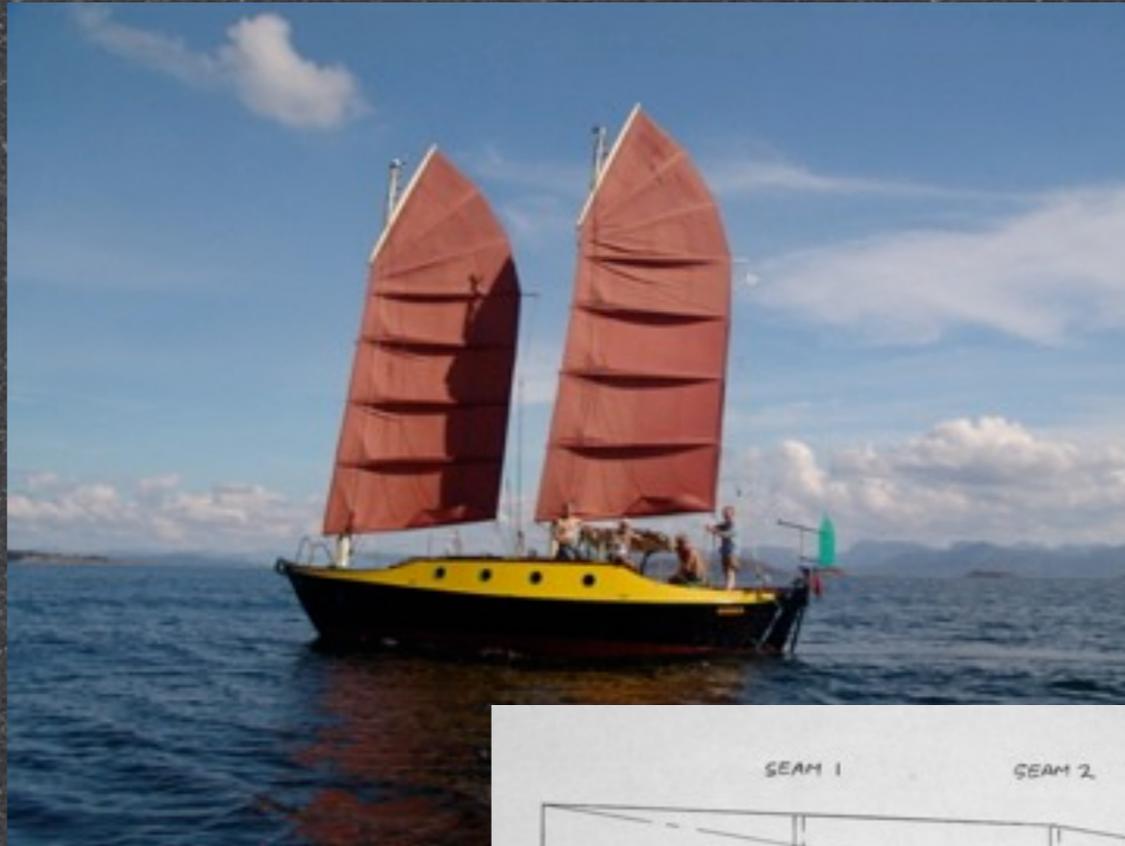
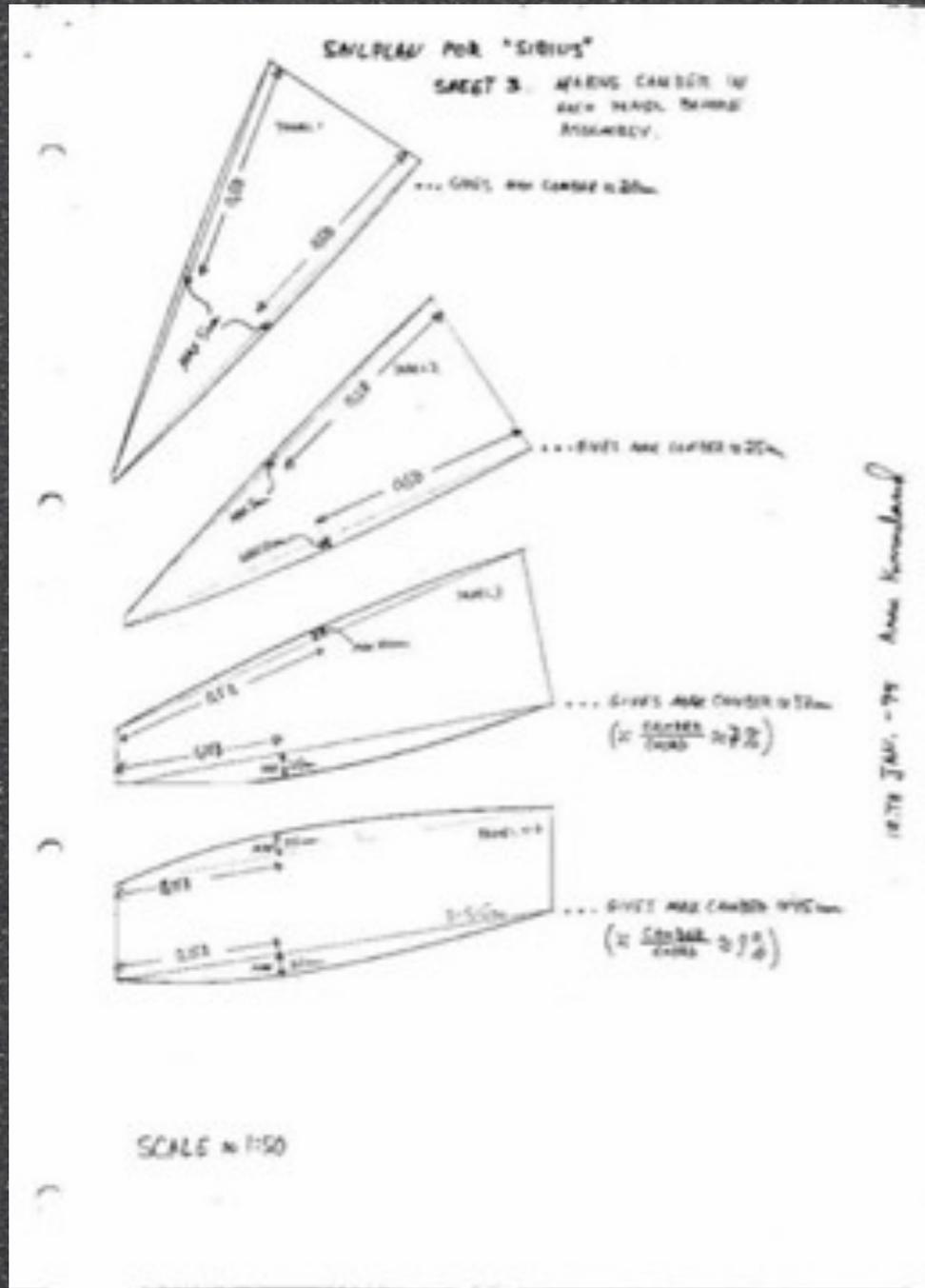
The fiendishly-clever Chinese way of adding camber, that Blondie Hasler somewhat overlooked when he designed his rigs

A fanned sail develops camber in its upper part by twisting, even if it is cut flat

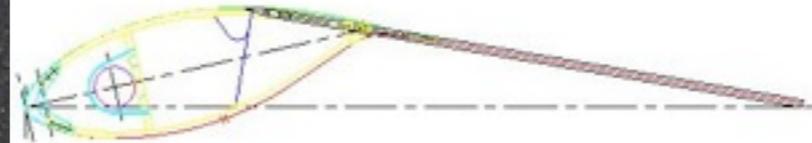


Hinges have been used successfully, but most ocean sailors don't favour them

Hinged battens have been used, but integrity is compromised, and the standard of design and manufacture must be high



The preferred approach is to build camber into most of the panels of the sail, using a variety of sailmaking techniques - broad seam, shelf foot, tucks etc



"Tystie" has covered nearly 50,000 miles with these sails. The first (GRP) battens were replaced a year ago, in New Zealand, with lighter, better shaped ones in aluminium alloy

Best, but at a high cost, is the "soft wing-sail", enclosing the mast. The after part of the sail has stiff battens, but the forward part is doubled around wishbones, enclosing the mast



There are many different
planforms and varieties
of junk rig

From left to right:

1. A Wharram catamaran with a wing sail on each hull
2. A “split rig”, with cambered “jibs” and mainsail
3. A commercially available sail shape



“China Moon”, in
the Tamar River

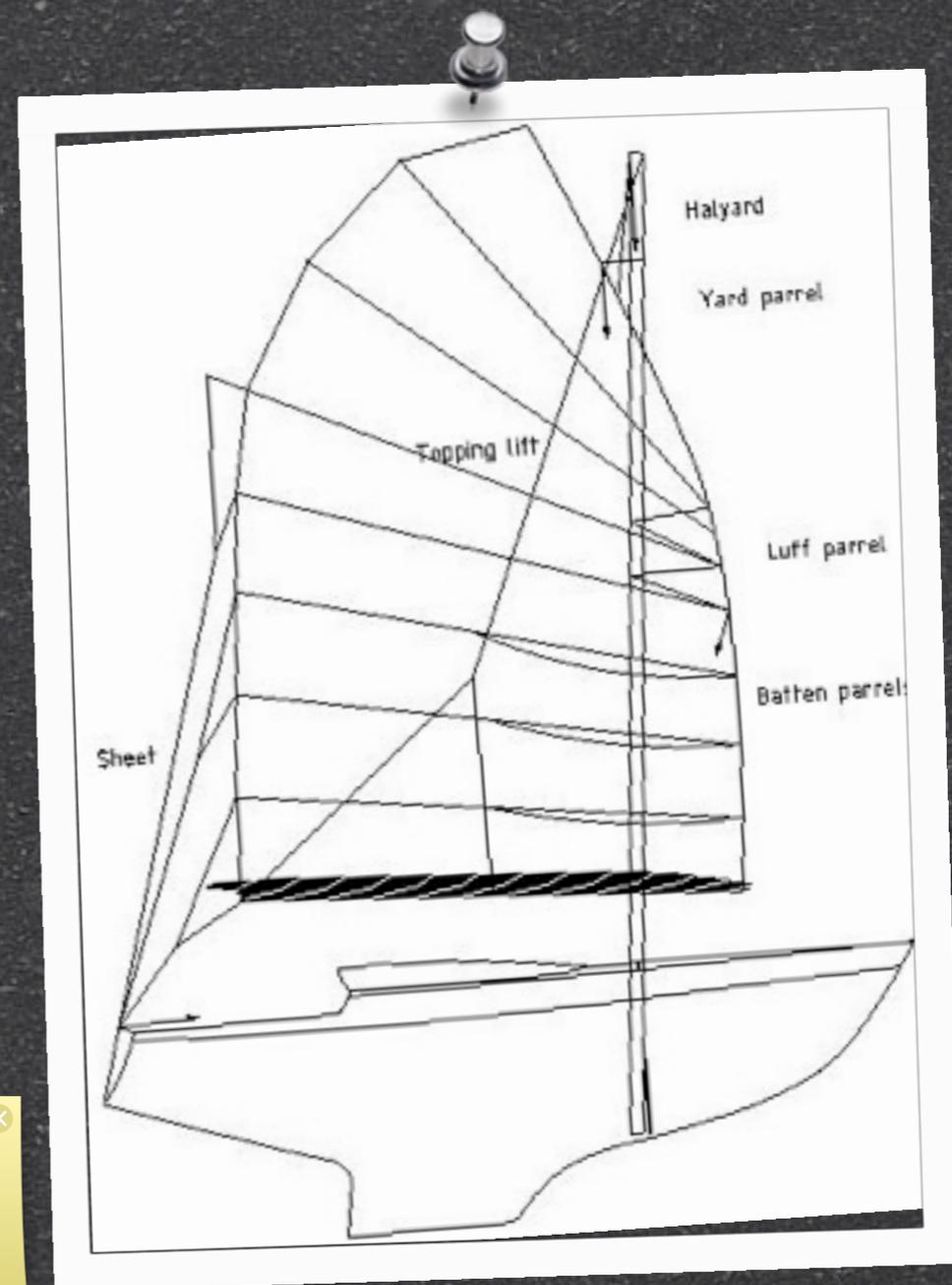
Junk rig on a catamaran- one mast in
each hull

Aren't all the control lines very complicated?

- Not as complicated as those in a bermudan rig - just different
- A halyard, usually with several parts because the sail bundle is heavier
- A sheet, which also acts as reefing lines
- A yard parrel keeps the yard close to the mast
- A luff parrel peaks up the yard and shapes the sail
- Batten parrels keep the battens close to the mast
- Topping lifts support the aft end of the sail bundle
- Another lift supports the forward end of the sail bundle
- There may be more luff parrels
- There may be batten downhauls

A fanned sail

One of the modern sail shapes, with the major lines shown



A Raven 26', "Fantail",
now being rigged in New
Zealand

Is an un-stayed mast safe?

- Safer than a stayed mast

- If it is designed right, and built right, it is very difficult to get an un-stayed mast to fail

It takes a load in excess of that for which the rig was designed - a 360 degree rollover will do it

- A stayed mast relies on every component of its complex triangulated staying system being in place - if one little pin is lost, the whole rig might be lost

- Stays often fail through fatigue

Isn't an unstayed mast very heavy?

- The un-stayed mast itself is heavier than a bermudan mast, because it must be designed to resist bending loads
- The bermudan mast is lighter, because it only has to resist compressive loads
- However, when the weight of all the standing rigging is added to the weight of a bermudan mast, the un-stayed mast usually shows a weight saving

Can I make a junk rig for my boat?

- There is nothing that a backyard handyman cannot make - unlike bermudan rig
- Spars can be of wood or aluminium alloy tube
- If you made it, you can also mend it in remote places
- Sails can be made from polyester sailcloth, but since the stresses are lower than in bermudan rig, a wider range of fabrics is suitable - making home sailmaking easier
- Try a dinghy rig first

Where can I find out more?

- The standard book is “Practical Junk Rig”, by Blondie Hasler & Jock McCleod. We have made advances in several areas since it was published in 1988, but up to the stage of development that they reached, it cannot be faulted. It is an essential reference when

designing and building a junk rig

- The Junk Rig Association has a website at www.junkrigassociation.org with a great deal of useful knowledge, and fora to talk with fellow enthusiasts