

IF YOU LOSE YOUR RUDDER

by JOHN and LANA CAMPBELL

WE GOT some amused looks from the marina watchers as we struggled in the hot sun, trying to fit the emergency tiller. We were preparing to deliver a new 60-foot schooner from Florida to the Caribbean, and decided that the best way to see how the unwieldy collection of stainless steel tube assembled into an emergency steering system, would be to try it in harbour.

Once we had dragged the contraption up on deck, assembled it, and inserted it through the hole in the deck, we found a major problem. Whoever had designed the emergency tiller had forgotten that the boat had a backstay. We had to shorten the tiller by several inches before it could clear the backstay. Not an easy job with thick-walled stainless tubing. Feeling pleased with ourselves, we put the whole mess away, not for a moment expecting that we

would ever use it in earnest.

A couple of weeks later, some three hundred miles north of the Virgin Islands, a sudden squall from a clear sky caught us with too much sail up. To ease the strain on the boat, and to try to reef the roller reefing headsail without it flogging to pieces, we tried to bear away and run off with the squall.

The boat, overpressed, was carrying a lot of weather helm. The pressure on the wheel was considerable as we gave her full starboard helm. She was just beginning to bear away nicely when there was a most dreadful splintering noise from below, and the wheel went slack.

We quickly rolled up the headsail and put a reef in the foresail. The main was already reefed. She hove-to fairly comfortably under reefed main and fore, while we went below to assess the situation.

It did not take us long to discover the problem. The wheel was connected to the rudder by cables running over a series of sheaves. Four of the six sheaves were bolted to massive steel girders, and two were just bolted onto a plywood bulkhead. It was one of these that had given way, taking a fairly large piece of bulkhead with it. It looked like a fairly easy job to jury rig, but meanwhile, the rudder was slamming from side to side, threatening to tear itself loose. Time for the emergency tiller.

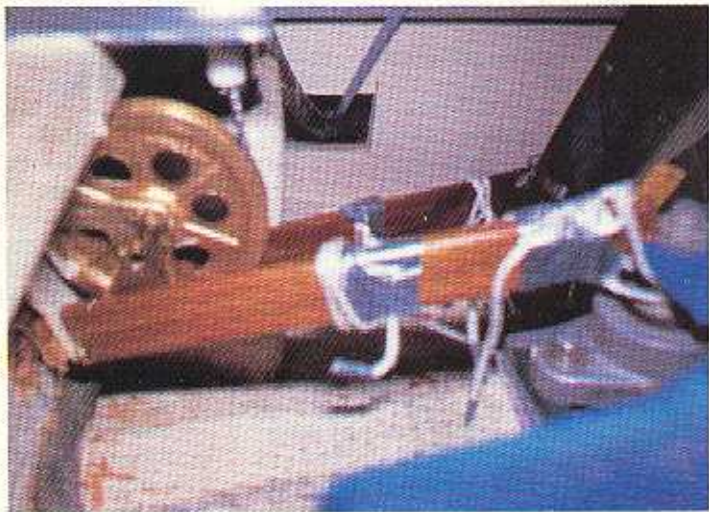
At least we knew how all the parts went together, and we did not have to stop to saw off pieces of pipe to make the thing fit. But it was still a struggle. A heavy piece of pipe about five feet long had to be fitted through a hole in the deck, to engage a wildly gyrating rudder stock, invisible to those working on deck. After a lot of 'left-a-bit', 'right-a-bit', 'up-a-bit', and 'down-nous', we got it assembled. The tiller had to be restrained with two tackles; no way could it be held by hand. Once it was set up, we found it worked quite well, but what prompted us to get on with jury rigging the main steering system was the water that poured in where the emergency tiller passed through the deck. Every wave that came on deck poured gallons of water below, into the after cabin.

We demolished a bookshelf, and made a series of struts and lashings to hold the loose sheave in place, and this jury rig held all the way to the Virgin Islands.

After that experience, were I to design or build an emergency tiller



The emergency tiller shipped and the steering tackles rigged (left). Below is some idea of how we 'repaired' the original steering gear. The restraining tackle (bottom left) helps reinforce the arrangement at bottom right.



arrangement for a wheel-steered yacht, I would go to great lengths to make the thing as small and light as possible, and easy to fit. The steering is most likely to fail when the going is tough, and those are the conditions when it is hardest to fit the emergency equipment. The other consideration would be to ensure the water-tight integrity of the yacht, with the emergency equipment in place. We took vast quantities of water through the hole in the deck, despite trying to stem the flow with rags and plastic bags. Even raising the hole an inch or so above the general deck level would have prevented the water flowing over the deck from pouring in.

When we built our own boat, *Papilio Ruga*, we chose to build her with tiller steering for cost, simplicity, and reliability. The tiller, rudder, and stock we deliberately overbuilt, and then we thought about what could still fail.

We used two-inch diameter solid stainless steel bar for the stock. Bronze would perhaps have been even better, but is hard to find, so we settled on marine grade stainless. Stainless steel can undergo strange changes underwater, particularly when water is

trapped against the steel (See PBO 159,38). We have seen several cases of stainless steel rudder shafts suffering from crevice corrosion, where the shaft passes through a close-fitting bearing. So we got to thinking about what would happen if the rudder stock broke where it passes through the centre bearing. This would leave the rudder swinging independently from the tiller. In anticipation, we have drilled a hole near the trailing edge of the rudder. It should be comparatively easy to pass a rope through this hole, with a stopper knot either side of the rudder. The rope can then be led up onto the deck on either side and used to control the rudder blade directly.

Such an arrangement would have also helped a large racing boat we met in the Azores a few years ago. Something had happened inside the rudder blade itself. The blade had become free to turn on its shaft, and the crew had been unable to find any way to control it. They resorted to building a complete jury rudder to enable them to reach the Azores.

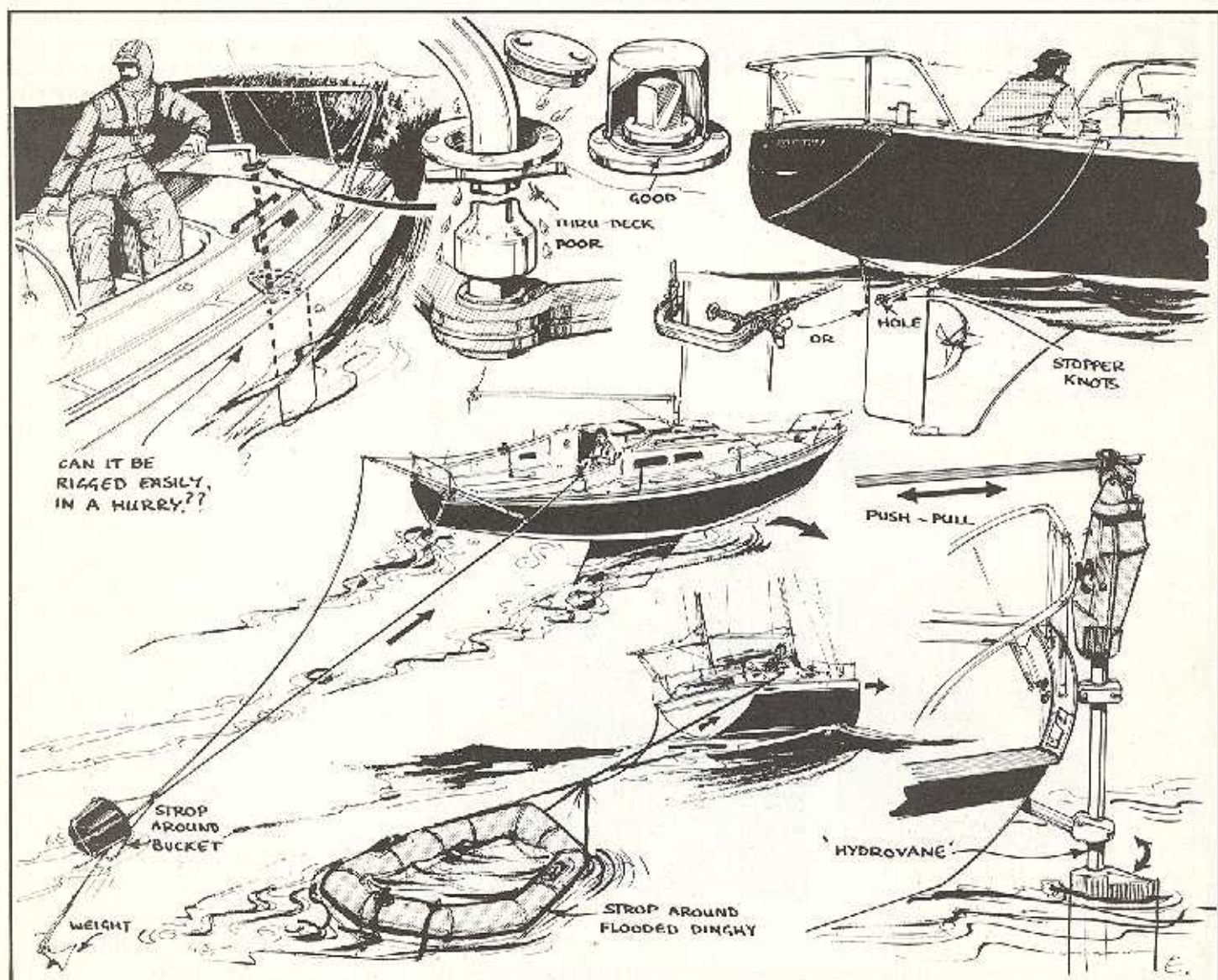
We have seen several boats carry a complete spare rudder assembly, ready to be fitted on the transom, but this is

probably overkill. However, some self-steering gears are in effect a complete secondary rudder (for example the Hydrovane), and operate independently of the boat's steering system. Others, such as the Aires, could be adapted by making a balanced rudder blade to fit over the servo pendulum.

The pendulum part of the vane gear is prevented from moving from side to side by securing the ropes that normally lead to the tiller or wheel. Moving the wind vane from side to side rotates the servo rudder blade, and the resulting steering effect is quite pronounced. We have found that the existing servo blade on our *Aries* will steer *Papilio* quite happily under power, but to do so under sail, the area of the blade would have to be increased somewhat, by bolting on a piece of plywood.

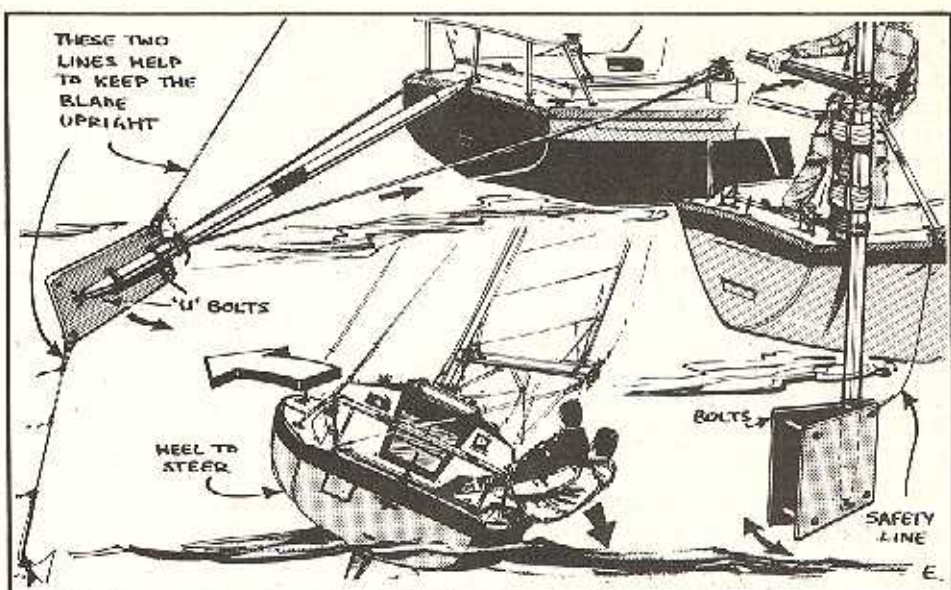
For a long keeled-boat, with rudder hung on the after edge of the keel, the chances of knocking the rudder off are pretty remote. But a skeg hung rudder, and even more so, an unsupported balanced spade rudder is susceptible to impact damage.

For a boat steered by such a rudder, it would be a good idea to plan how to rig



a jury rudder. The textbook way is often along the lines of bolting the top of the saloon table to the spinnaker pole, which in turn is lashed to the stern pulpit. The whole assembly can then be controlled with two lines leading to the sheet winches. I suspect that that is another of those jobs it is easier to write about than to perform, especially when it is blowing half a gale and a lee shore threatens. However, without suitable bolts, drill and bits, the job will prove even more difficult and time-consuming. A bit of forethought and ensuring that the tools are aboard could prove well worth while, and at least make the job possible.

Because of their generally lighter weight, multihulls, are often easier to steer than the 'lead swingers'. We heard of one trimaran that lost its spade rudder to a passing whale, and was subsequently steered for several hundred miles by the simple expedient of towing a strong bucket. The bucket was towed on a double bridle, one side leading through a block on each outrigger, and then to a sheet winch. By pulling on one line or the other, the



effect of the drag was moved from one outrigger to the other. Because of the wide beam of the trimaran, the steering effect proved considerable. Such a trick might be worth trying on a monohull, especially if the boat is fairly beamy,

light, and the course is basically downwind. (I know of at least one monohull that was steered back into harbour by buckets port and starboard — Editor).

It can also be quite illuminating to try sailing the boat without touching the helm, steering by the sails alone. As kids, we sometimes raced each other in sailing dinghies, without the rudder shipped. After a bit of practice, we found we could steer quite well by balancing the sails and heeling one way or the other. We even got to where tacking could be executed quite rapidly, although controlled gybes proved beyond our reach.

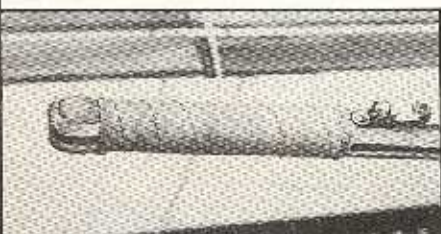
Most displacement boats can be persuaded to take themselves to windward or on a close reach without resort to the rudder. A long-keeled boat, with the sail plan well spread out along the length of the boat, will balance more easily than one with a short fin keel and a high aspect-ratio sail plan. It might provide an interesting half hour if you try it with your own boat, and see how she responds. Do pick a spot in open water and away from other vessels though, as you may do a sudden tack or two before you master the trick.

Any boat can be persuaded to sail more or less downwind, by setting a modest amount of sail forward, and dragging something in the way of a drogue behind. So, if your boat can close reach on either tack, and run without the rudder, you already have made the boat easy to steer on several different courses. Quite a modest emergency system, say a large oar or sweep, will then be able to 'fine tune' the course, and get you safely home. All too often we have heard people taking the easy way out by calling for help, when perhaps they could have helped themselves. Coping with problems is part of the challenge of sailing, and a steering failure is one problem that usually can be coped with, if there is a little forethought. Of course, such a failure may also be prevented by regular maintenance and inspection of the steering system — how's your's? ●

French hitching

There is nothing very clever about French hitching. It is simply a continuous row of half-hitches. However it is a quick way of making a cover and it does provide a comfortable grip. Use Marlow eight-plait polyester, 1.5mm diameter or bigger if desired.

Bill Beavis

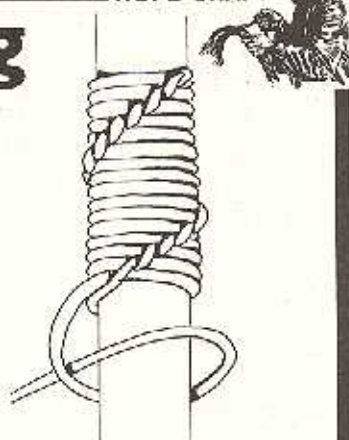


The spiral pattern has been broken up on this tiller handle. Turk's heads at each end improve the appearance.

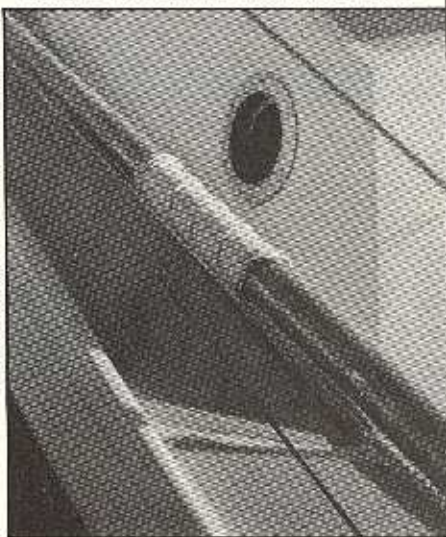


Steel surfaces are uncomfortable to the touch; sweaty in hot weather and icy in the cold. French hitching insulates and improves the hold. Also useful on the handles of oars.

ROPE-CRAFT



So long as you work consistently and do not tug the line over-tight the pattern of hitches takes a spiral shape of its own accord.



Fender hitching on a spinnaker boom where it touches the forestay prevents chafe.