

SPINNAKER RIGGING

A COMPILATION OF THREE SEPARATE ARTICLES

1. Simple Systems

By Oliver L. Shaw

Updated to 14th February 2011

I have to stress at outset that I no longer race, or have any great interest in racing. Although I did race extensively at one time, and to a good standard, that was several decades ago, and my interest today is cruising. What follows is therefore an attempt to outline principles, and simple ways of rigging the spinnaker, but it makes no attempt to represent contemporary top racing practice; for that the reader must refer elsewhere.

There are so many different ways in which the boat can be rigged that it is well worth looking around at a variety of different boats, and talking to their owners, both at one's own sailing club and in the course of travelling. The following link may be helpful, recommended in July 2007 by Luke Shaw in the Discussion Forum on our website in answer to an enquiry about mainsheet rigging: <http://www.petercull.co.uk/f187634146/>.

FITTINGS:

As a minimum you will need:

On the mast:

1. A spinnaker halliard; 5 mm is ample, preferably braided. This emerges through a sheave above the genoa halliard.
2. A ring onto which you can clip the pole; on my current Series 1 mast the centre of this is 1418 mm above the foot, which I presume is correct and which certainly seems to work satisfactorily.
3. A means of mounting the uphaul/downhaul. I think from memory that on early masts (e.g. IYE, and many retro-fits to wood masts) there is an eye plate for a fixed uphaul a little below the genoa sheave, but more modern arrangements use a sheave instead of a fixed plate, and bring the uphaul down inside the mast and hence to inside the boat, where it can be adjusted. Even if the original was a simple fixed uphaul it is possible that a previous owner may have replaced this with an adjustable system. Early arrangements tended to also fix the lower end of the downhaul to a plate on the mast just above the deck, using shockcord for at least part of the uphaul, but more modern practice is to bring the downhaul down through the deck (via a bushed hole immediately forward of the mast) and thence to inside the boat so that it too can be adjusted.

On the pole:

1. A pair of (similar) end fittings to allow you to secure either end of the pole to the clew of the sail, or to the guy, and the other end to the ring on the mast. Avoid nylon fittings that just clip on and rely on the elasticity of the nylon; they were very popular in the sixties, but they once gave me a capsize when racing offshore in force 5/6 (and cost me any hope of a position in the race) when they weren't up to the load, and the pole pulled straight off the mast.
2. A means of attaching the uphaul/downhaul to the centre of pole. The popular options are (1) an eye plate on the pole, and either an S-hook or a carbine hook on the line, or (2) a double inward-facing horn jamcleat (i.e. two separate horns facing each other), with just room to pass the line between them, and then jam it under the one nearer to the mast. Some owners using the second option have the line knotted either side of the intended attachment point, or even (if they want to vary the attachment point) every few inches in the relevant part of its length, in order to ensure no slippage.

On the decks:

1. A pair of fairleads, roughly amidships, and as far outboard as possible.
2. Optionally, jam cleats for these fairleads.
3. Optionally, a second pair of fairleads, or hooks, or snatch blocks, well aft and as far outboard as possible. However although I originally fitted these to my then boat, in the sixties, I never in fact chose to use them. My Series 1 boat *Strait Laced* came with aft fairleads, which I removed at an early stage. I have the impression that these were very popular in the early days but that they have fallen out of favour, but this is one detail on which an owner might want a second opinion. However I note that the late Richard Estaugh, many times National and World Champion, says in his *Tuning Guide*: "Due to the relatively small size of the GP14 spinnaker there is no advantage to be had from sheeting to the transom. We put the fairleads at the widest point in the boat." A multiple World Champion's opinion is good enough for me, particularly when it coincides with my own view!
4. Optionally, a clip or a clamcleat to retain the spinnaker halliard close to one of the shrouds when not in use, just to keep it out of the way.
5. Optionally, reaching cleats, or alternatively fairleads and jam cleats for twinning lines.

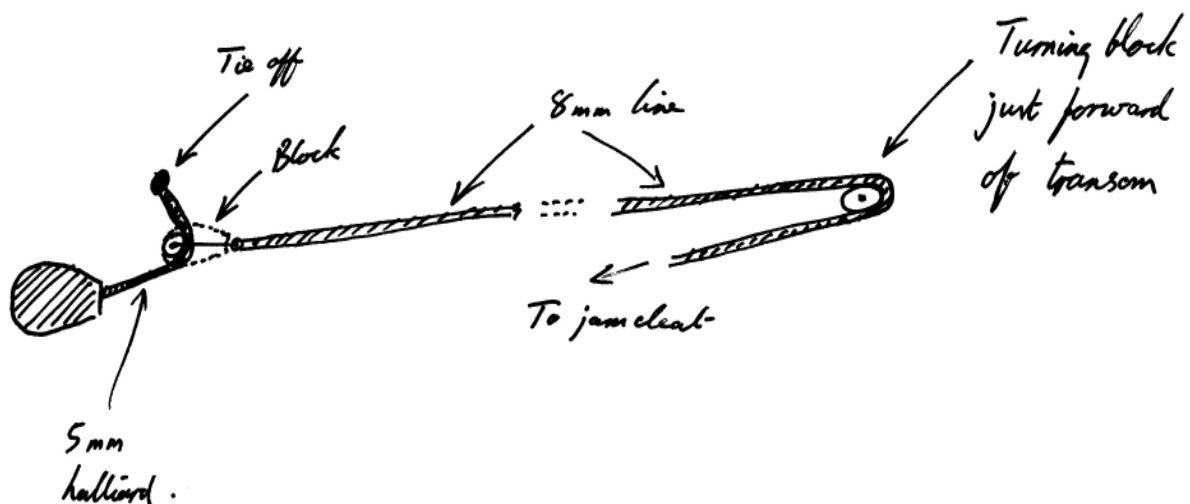
Within the boat:

1. Preferably, a receptacle for stowing the spinnaker when not in use. This must permit ease of bundling the sail into it as you hand it, and ease of flowing out when you hoist. Most people choose purpose-designed spinnaker nets (or bags), but a simple plastic bucket (tied into the boat) will suffice almost equally well. However I know at least one keen racing owner at a fairly high-profile club who uses nothing - he simply dumps the sail on the floorboards.
2. Lead the halliard to a convenient point, and provide it with a jamcleat. Many owners like to lead the halliard aft along the centreboard case to the helmsman, but a minority lead it to the crew. In either case, the final lead should be upwards, from a turning block.

RIGGING, ROPES, ETC.

1. Halliard. The simplest is just a single length of rope, from the head of the sail up through the sheave in the mast just above the forestay, down inside the mast to the sheave at the bottom, and then back aft to a cleating point at the back of the centreboard case. That will work, but many owners prefer to fit a 1:2 purchase, so that the sail goes up at twice the speed that the helmsman pulls on the halliard. This purchase (which is the opposite way round from the more usual 2:1 purchase which is often used for other applications, to magnify force) can be rigged down the front of the mast, or (I understand) inside the mast, or in the bottom of the boat.

To rig it in the bottom of the boat, have a length of 8 mm braided rope running aft from the jam cleat to a turning block just ahead of the transom, then forward to near the mast, with its end terminating in a block - so when you pull in this line it pulls the block aft. From the sheave at the bottom of the mast the halliard goes through this block and then ties off to any convenient point; on my Series 2 boat I tie it off to the toestraps mounting plate. As you pull the 8 mm line the block moves aft, and the 5 mm halliard is pulled at twice the speed at which the block moves (see diagram).



2. Uphaul/downhaul. The simplest is a length of shockcord secured to the eye plate on the mast just below the forestay, and the other end is then joined to a length of rope brought down to the mast immediately above deck level. If there is enough "give" in the shockcord that will actually work quite well, but it won't be adjustable while sailing. See below for a more modern system.
3. Sheets/guys. One for each clew. Your personal choice whether you go for two separate sheets or one continuous one; a continuous one is always to hand and you never find that the one you want is lying in the lee bilge, but it is more prone to get in the way when not in use and when you are moving around the boat.

Halliard

When fully hoisted, the head of the sail should be a few inches out from the mast. Many owners put a stopper knot in the halliard that distance back from the sail, and then just hoist until the knot hits the sheave.

You can either fit a lightweight snap shackle to the end of the halliard or simply tie it to the head of the sail with a bowline. Lightness is a virtue here, particularly in very light winds, since the sail will be set flying, so simply tying it on is the preferred method for many owners.

Uphaul/Downhaul

Most modern systems use a rope uphaul, and take it through a sheave just below the forestay, and thence down the mast and out at the bottom, and thence to the thwart - either on the centreboard case or outboard to the side bench or the deck coaming. This ensures that the uphaul can never stretch, and so the pole will never droop (and thus kill the shape of the sail). Likewise the downhaul is rope, usually led down through a small bushed hole in the deck immediately forward of the mast, and thence similarly aft to a point adjacent to the uphaul. If they are colour coded you can tell them apart. Some owners (myself included) like to have enough elastic built into the downhaul to keep the line just taut against the mast when not in use; others prefer no elastic at all, and just accept the line slopping around when not in use.

Sheets

If using two separate sheets they may be permanently bent onto the sail, but if using continuous sheets that is not possible. In either case, simply tying them with a bowline, or permanently bending them on with a seized eye, is lighter than using shackles etc., and for that reason many owners prefer it. It is also much safer; if a flogging shackle hits someone in the face they could easily lose an eye. Although the latter concern applies primarily to the headsail (jib, midi, or genoa) it does also apply to the spinnaker.

Simple sheets work well, but when reaching the pole is close to the forestay, and the angle between the guy and the pole then becomes extremely narrow, which makes the pole difficult to control, and imposes increased stresses on the line and the fittings. Reaching hooks, comprising either just a fixed hook or a clam cleat with a hook built into it, enable the guy to be cleated near the shrouds instead of further aft, which improves the angle and thus reduces the loads. If there is some suitable mark on the guy (brightly coloured thread sewn in, for example), it is quick and easy to always cleat it at the correct position for reaching, and the pole cannot then go any further forward.

Many modern racers take this a stage further, and prefer to use twinning lines to control the guy. That is perhaps best seen in the flesh, looking at boats and talking to their owners, but essentially a control line ends in either a ring or a lightweight ball-bearing block which runs freely on the sheet and the guy. The control line runs through fairleads on the deck near the shrouds, and is provided with jam cleats.

On the lee side (i.e. running on the sheet) this control line is left slack, and the ring or block runs freely; this has little or no effect on the sheet. On the weather side, the control line is pulled in tight, and cleated; effectively the ring or block now becomes a new fairlead for the guy, in a comparatively forward position, thus improving the angle to the pole.

Additionally there is often a stopper at this point in the guy, which prevents the guy paying out too far. This is formed by using a continuous sheet, with two different diameters; essentially the core is continuous, but the outer sheath is present only in the region that is likely to be handled, and is removed from the ends. A plastic ball stopper runs freely along the core (which forms the ends), but it won't ride over the sheath, so it stops at the transition point where the sheath commences. The lengths are such that when this point is jammed against the twinning line, with the latter pulled tight, the remaining length is just sufficient to allow the pole to not quite reach the forestay.

2. From *The Basic Boating Book* **1st Edition (1982)**

SPINNAKERS **by** **BRIAN HAYES**

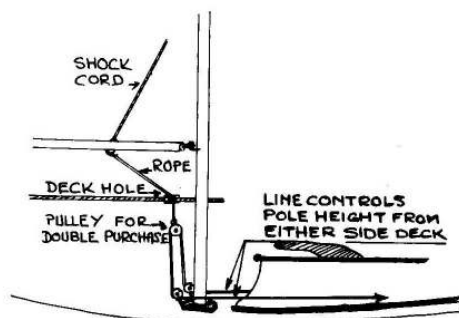
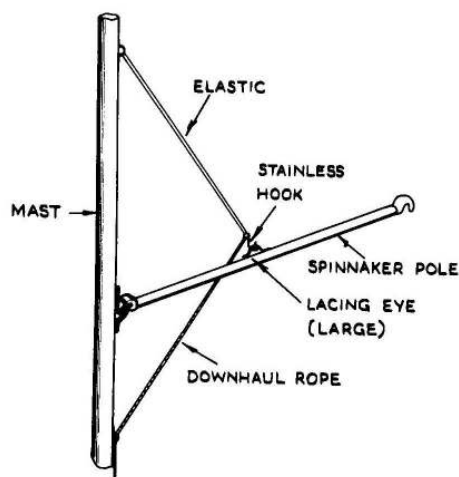
Calendar photographs of beautifully coloured and patterned spinnakers portray a quite deceptive image of beauty and tranquility, a world of handsome young men with bronzed topless girlfriends draped artistically around sundrenched foredecks.

In reality for most of us the spinnaker in a fourteen foot dinghy is the "extra" sail, the one to learn about long after the basics of upwind, downwind and crosswind sailing or genoa and mainsail have been digested and understood. It is tricky to fly, a specialist sail intended for use downwind and crosswind only, too full to be carried to windward. Designed to float in the lightest airs it is made from nylon material only a quarter of the weight of the average mainsail fabric, and pretty or not it also seems designed to make even the nicest people shout and swear.

But you shouldn't really worry about the spinnaker, it is there to be enjoyed. It is a small sail readily handled in sensible conditions by female crews or older children and, cruising or racing, it is a sail which will get you to your destination more quickly and give a new dimension to your sailing. This is particularly important for the crew whose life can become very tedious with only a genoa luff to concentrate on when sailing downwind. You can avoid early pitfalls (1) by keeping the fittings simple and making sure that they work, and (2) remember to buy good fittings which will do the job properly first time. Poor fittings will fail quickly, and add to the crew's difficulties in learning how to handle the sail as well as needing replacement.

You will need a non-stretch halyard (braided rope, not three strand) and one good strong jamming cleat to hold it when hoisted. Decide whether the helm or the crew is to hoist and place the cleat in the most convenient place for him. Most racing crews prefer to let the helmsman hoist, leaving the crew free to attach the pole and tend both sheets. Obviously two sheets are needed, attached to the port and starboard clews and they can be lead very simply to fairleads placed at the back of the genoa fairlead tracks, a position which is efficient for the sail and reasonably comfortable for both crew members most of the time. Each sheet should have its own strong jamming cleat set on the inner edge of the side deck and carefully placed directly between fairlead and crew. When hoisted the spinnaker must be set on a boom which must always be on the opposite side of the boat to the main boom. From experience it really does pay to buy a good strong pole with end fittings from a top manufacturer from the beginning.

The pole will need to be "held up" and prevented from bouncing up in the gusts and down to the deck in the lulls by an "uphaul and downhaul" attached to the mast. Once again, let simplicity rule. An old fashioned rope downhaul and elastic uphaul will be quite adequate provided the elastic is in good order. The boom should have a large lacing eye attached to the centre and a hook knotted to the uphaul and downhaul will keep the pole at a constant height.



With only a little greater sophistication the pole height can be made adjustable by passing the downhaul through a 5 mm hole in the foredeck in front of the mast and back to a cleat. For further ease of adjustment a two part purchase can be introduced below deck level and the adjusting ropes led to two cleats each side within reach of the crew. You will find that it is very helpful to ensure that the fittings work efficiently and that the halliard runs freely up and down the mast. Learning to use a spinnaker is tricky and you can do without unnecessary gear failures. Patience is needed by both helmsman and crew and practice is the only way to become "perfect". Initially it may pay to adopt someone else's system and work to it religiously until you are sure enough to make your own changes. Once again, copy a simple system and work on it - don't be shy.

Initially learn to hoist when running downwind in a breeze just strong enough to keep the boat moving sensibly along - a drifter will teach you very little. The helmsman should give a clear order that the sail is to go up and while he hoists the sail, standing firmly in the centre of the boat, the crew, also keeping in the middle of the boat, should grab hold of the pole, attach one end to the windward sheet, attach the uphaul-downhaul hook to the centre eyelet on the pole, and, finally clip the in-board end of the pole to the hoop fitting on the mast.

Once up, the crew should preferably be allowed to sit to windward and play both sheets (much more efficient and much more fun for him), while the helmsman keeps the boat balanced, steers down the waves, keeps the boat in clear \ wind and warns the crew if a gust or a wind change is coming. The crew's job is to keep the sail filled and the golden rule is to keep the sail as free as you dare, with the windward sheet and the pole as far to windward as possible and the leeward sheet as free as possible. Watch the shoulders of the sail, pull the pole a little to windward until the edge begins to collapse, then ease back a few inches until full - then try pulling to windward again and back, testing all the time to see whether the wind direction has changed.

On lowering, the helmsman must give the command in good time, the crew should unclip the pole first from the mast, then from the uphaul, then from the spinnaker sheet, hand back the pole to the helmsman without dropping it over the side or disturbing the helmsman's false teeth and gather the foot of the sail. The helmsman should uncleat the halliard and the crew then lowers the sail carefully between the foredeck and the genoa sheet into a spinnaker bag or onto the floor. The crew should check that the centreboard is adjusted for the next leg. Remember that much of the chaos seen in some boats, that drives wives from the water for ever and good crews to even more drink than usual is caused by fittings that fail and halliards that knot up at the wrong time instead of running free. Don't blame the crew for being slow if the fittings are at fault. Both helmsman and crew have their own jobs to do and much unnecessary frustration can be avoided if you let the other get on with his job keeping the "helpful" suggestion to a minimum number of vital ones.

Turning finally to the sails themselves, most modern spinnakers from sailmakers manufacturing sails regularly for GP's are pretty good buys, and will set easily and well. A good secondhand sail can also be a sound purchase for the beginner. Avoid anything more than about three years old and you will have a very good chance of picking up a sail of sound design and without excessive stretch. And, new or old, it is a good idea to avoid very dark colours (difficult to "read") and white (excessive glare in sunlight). All white spinnakers are also often made of "Dynac" a top of the market, high quality product, perfect for the top of the fleet but brittle and too easily torn at the hands of beginners (and most of my own crews).

3. From *The Basic Boating Book*

3rd Edition (1996)

Part of an article by Simon Relph

Spinnaker Fittings

Much variety is possible here. I will describe my system, which works; however some simpler fittings would be satisfactory.

1. Halyard Cleat - This is best placed on the side of the centreboard case, near the back, so that the helmsman can easily reach the halyard to hoist the sail (HA 4977 or similar).

2. Through Deck Fairleads (R534 or similar) - These should be ball bearing leads, fitted approximately level with the back of the side benches, in the centre of the side deck. These turn the sheet forwards up to a swivel block, mounted on a metal lacing eye which is screwed onto the deck-knee. The block is held onto the eye with a spring which prevents the block from turning back on itself and jamming the sheet. Directly above these on the inside of the side-deck, a Holt-Allen mini cleat should be fitted, so that the windward spinnaker guy can be cleated when reaching in strong winds and also when gybing with the spinnaker up. In addition to these cleats, I also use reaching clam cleats positioned just in front of the shrouds, on the edge of the side deck. These are an alloy clam cleat with a hook fitted on, so that the guy can be hooked in and adjusted to the required position. These are particularly useful in strong winds and, if the sheets are pre-marked either with ink or thread, the guy can be set to the correct position very quickly, therefore reducing the amount of panic that usually ensues after rounding the weather mark.

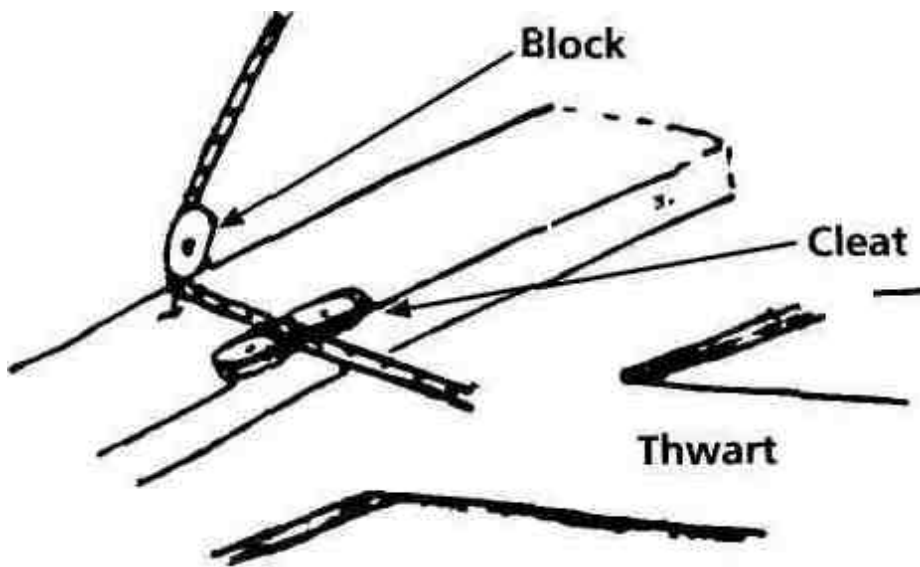
2. (a) An alternative to through deck sheeting is a simple fairlead and cleat on the side deck. These should be kept about 4½" apart, to prevent any accidental cleating! The best fairlead to use is the HA 134. Cleats recommended are either HA 4077, R 3530 or Harken 200, or Servo 22.

(b) Instead of reaching hooks, a system which has become increasingly popular is 'Twinning Lines'. I have personally been using these now for four seasons, and wouldn't ever use anything else. Another small refinement that we also use in strong winds, is an extra cleat on the side of the centreboard casing, whereby the crew can hoist the sail when it is too rough for the helmsman to stand up and risk losing control of the tiller. Finally, I strongly recommend that you should use spinnaker bags. These are fitted onto the forward coaming one in each corner. Not only do they keep the spinnaker drier than on the floor, but are useful for storing spare tools, cigarettes, sandwiches, etc.

I use the loose pole system which I consider to be simple to use yet efficient. The pole ends are plastic and are operated by a thin rope running the length of the pole, passing through the uphaul/downhaul eye, enabling either end to be released easily without the risk of them opening unintentionally. The pole is attached to the uphaul/downhaul by a simple stainless steel hook.

Most boats on the open meeting circuit use continuous spinnaker sheets which I consider to be a necessity. This enables the helm or crew to keep their weight on the deck when picking up the new sheet after the gybe, instead of having to lean across to leeward to take hold of the loose sheet end.

Spinnaker sheet fairleads are set behind the genoa tracks above the thwart, and on the thwart, just under the deck is mounted a ball bearing block which leads the sheet to a slightly raised cam cleat screwed onto the side bench. It is a good idea to sew brightly coloured thread into the spinnaker sheets at the point where the guy is cleated when the spinnaker is set for a close reach.



Instead of reaching hooks I use twinning lines which, to the uninitiated, are small ball bearing blocks permanently attached to the spinnaker sheets. A rope attached to the block runs through the deck at the shroud, through yet another block to a conveniently placed cleat. When released, the twinning line doesn't affect the set of the spinnaker and runs freely up and down the sheet. When cleated it helps to control the guy and takes it out of the way of the crew.

Finally, I must mention continuous genoa sheets. I've used these for about two years and found it makes tacking and gybing a lot easier as the sheet is always to hand. During the gybe it means either the helm or crew can trim the genoa without having to upset the weight distribution in the boat to sheet in a flapping genoa.