



Main man

The mainsheet trimmer is the boat's powerhouse, **Mark Rushall** explains how to keep your yacht going at optimum speed and angle around the course.

We are approaching the leeward mark, the breeze is light, the pole is down and stowed. The helmsman begins to turn for the gybe drop as the kite comes down. As the turn begins, we gybe the main, shouting 'heads!' then start to heave on the mainsheet, as fast as possible to help the boat through the turn. We exit the mark on our closehauled course, with the traveller to windward, boom on the centreline, main nicely

twisted for acceleration. But we're not as fast as we should be: what's wrong?

The helmsman explains: 'I just can't start the turn that fast: the speed of turn increases through the rounding: the main needs to come in just in time. You were ahead of me so the mainsail was stalled, losing drive at exactly the time we needed it most!'

Unlike a dinghy where we can make small helm corrections to keep the sails driving, in a big boat we have to be constantly trimming to the current situation. Big boat sailing is a team game, and we need the coordinated help of the rest of the team too!

The aims

■ **Upwind speed and height:** Once the foresail is trimmed for the conditions, the mainsheet trimmer is the 'hand on the throttle'. Dropping the traveller/easing the sheet a small amount



PHOTO RICH PAGE

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will enable the helmsman to sail faster and lower, while pulling it up/winding on the sheet will convert this speed into height.

■ **Max VMG:** The mainsheet man will be working with the helmsman to keep the boat sailing at target boatspeed for the wind strength upwind. These targets give the best VMG for the prevailing conditions.

■ **Tactical requirements:** If we need more height to hold a lane, or more speed to roll a boat to leeward, the mainsheet man will react accordingly with traveller and mainsheet.

■ **Acceleration:** Off the startline, out of a tack or other manoeuvre, the mainsheet trimmer sets up for maximum acceleration. That means a more open twisted set up, but with the boom on the centreline: less mainsheet tension than full trim but traveller further up the track. As speed increases, he can progressively revert to max VMG set up.

■ **Speed in manoeuvres:**

Using the rudder is inefficient and, in extremis, the boat just won't bear away with the main trimmed on hard. The main trimmer can sheet on to aid a luff, and dump to initiate a bear away.

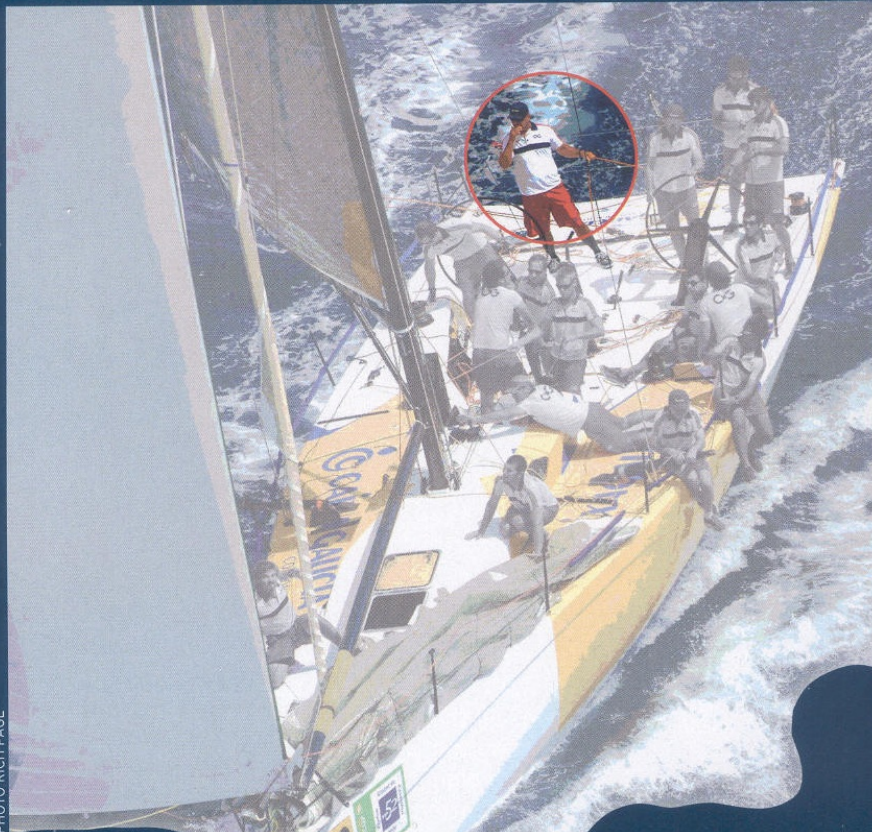
■ **Controlling power:** The mainsheet trimmer works alongside the foresail trimmer to keep the boat in balance and tracking. Too much heel or weather helm, and low speed, probably means too much power. If the helm is struggling to maintain height, having to push on the tiller, and speed numbers are high, this probably indicates too little power.

■ **Downwind:** On the run aim to maximise projected area, while maintaining flow through twist. On a closer reach maximise power up to the point that the boat is overpowered, then work with the helm to maintain a balance between power and control.

■ **Communication:** In smaller 'big boats', like the Mumm 30, the mainsheet man is often also the tactician. One of his most vital roles is to communicate the plan to the crew. On a bigger boat, he has to co-ordinate fine trim adjustments with the foresail trimmer. And of course the mainsheet man has to look after his crew during the gybe, especially unexpected ones before the start: 'heads!'

The tools

■ **Coarse tune:** The bit we pull in first, and the one we dump at the windward mark! Once set up we don't usually touch the coarse tune upwind unless a big duck is called for. It probably only has a four-part purchase, so it is a course adjustment of the angle of attack of the mainsail: pull it in upwind, let it off downwind!



Above The mainsheet trimmer is essentially part of the afterguard, and will work closely with the helmsman and tactician.

Main picture Balancing power and control, speed and height, are key components of the mainsheet trimmer's job – utilising the traveller to centreline the boom and fine tune to control twist in the sail.





Above Looking up for the windvane and top batten telltales: essential tools for trimming on a reach.

■ **Fine tune:** The mainsheet fine tune is effectively the twist control. Pulling on the fine tune upwind closes down the leech, reducing twist. Pulling too hard stalls the top of the mainsail: there is more wind up there, therefore the apparent wind is further aft, and the sail needs a bigger angle of attack. The telltale at the top batten is a clear cue: if it's streaming the top of the sail is not stalled. For maximum acceleration we need twisted sails: if we wind on too much power too early it will stall and we'll never get on the pace. Ideally, set the coarse tune so that with the fine tune uncleated, we have a perfect set-up for maximum acceleration.

■ **Winches:** Many keelboats have a continuous mainsheet. The trimmer can use either the port or starboard winch (usually the windward one). The leeward part of the mainsheet must be securely cleated in its self-tailer: as it is continuous, freeing either side will dump the sheet!

■ **Traveller:** The traveller is the fine tune adjustment for the mainsail angle of attack: ease the traveller down and the whole mainsail pivots around the mast, with twist remaining the same.

■ **Backstay:** Mechanical or hydraulic; increasing the tension de-powers the jib by straightening the forestay, and on a fractional rig de-powers

Below Through the gybe take the mainsheet and flick the boom over, careful to control it on the new side, and match the boat's rate of turn.



the mainsail by bending the mast.

■ **Checkstay:** On an in-line spreader rig, running backstays are fortunately someone else's responsibility. But the mainsheet man can use the checkstay adjustment to control the bend in the central part of the mast.

Other controls at the mainsheet trimmer's disposal, but operated by someone else, are:

■ **Outhaul:** Controls the depth of the base of the main.

■ **Cunningham:** Gets rid of the creases when a photographer is around, and flattens the higher part of the main in extreme conditions. Using more cunningham when bending the mast with backstay prevents the draught moving too far aft.

■ **Vang:** Controls twist offwind, and occasionally used to flatten the base of the mainsail upwind.

■ **Main halyard:** may need to be eased offwind in light conditions to eliminate any vertical crease from the mainsail luff.

Around the course...

Pre-start

This is often the most physical part of the job. Hopefully we'll sail a practice beat, so we can check that the 'static' controls (outhaul, backstay, cunningham, vang) are set up for the conditions. Now we can concentrate on main and traveller. If we are doing lots of manoeuvring we can often cleat the traveller centrally, and set up for the beat on the final starboard tack approach, so we just have the mainsheet. Unless the tactician calls otherwise, we are always trimming for speed – that means watching the wind vane, top telltale, and the front of the sail. Keeping the main driving all the time, and reacting to every luff or bear away, will mean that the boat is more manoeuvrable. In medium-sized boats, most of the work can be done with the coarse tune or without the winch handle. Housekeeping is vital: the sheet must always be ready to run. And if we are tacking from a reaching angle, aim to keep the main driving all the way through the luff.

If the tactician calls for half speed, ease the mainsheet until the front half of the main is backing, ready for a quick sheet on. If he calls 'stop', the main must go right out, immediately: even get help to push the main out and back the sail. 'Full speed...' on our final approach it's tempting to simply wind on the mainsail to full upwind trim: that will stall the sails, and probably the foils as well. Instead, set the traveller further to windward than normal, and wind the mainsheet on as speed builds. Until up to speed we want the sail in twisted, acceleration mode – the top batten telltale should be flowing all the time. As speed builds, wind on the mainsail, and ease the traveller to achieve full upwind trim. Once up to speed, 'on the numbers' is the cue for the foresail trimmer to check his bit.

Upwind

The mainsheet man's main cues come from the instruments and the top leech telltale. Every keelboat has an optimum speed for a given wind strength: sailing above this speed means we are sailing too free and unnecessary distance. Sailing below this speed is usually a result of sailing too

high. We use speed instruments rather than wind angle upwind because in powered up conditions, a two-knot increase in pressure makes little difference to the target speed, but a significant difference to pointing. It's easier to focus on a target which is not constantly changing with ever small gust. If targets don't exist start collating the data! In unusually flat or lumpy water it may be necessary to adjust our target speed by up to half a knot: establish this before the start.

In underpowered conditions, the top telltale should be streaming most of the time, this shows that the top of the sail is not stalled. To achieve this much twist and keep the boom on the centreline the traveller is well to windward. The backstay and cunningham are eased, outhaul tight.

As the wind strength increases, the fine tune is used to reduce twist: dropping the traveller keeps the boom on the centreline. Once fully powered up, we can probably get away with the top telltale stalling around 40 per cent of the time. Once twist is at its minimum, ease the traveller in the bigger gusts to control heel angle and weather helm, and pull it up the track to power up in a lull. Ease the traveller to let the helm put the bow down a couple of degrees. If exceeding targets pull the traveller up the track slightly to help the helmsman turn speed into height.

Modern keelboats tend to stall very easily: they do not respond to loading up the mainsail leech hard and dropping the traveller down the track. It may be necessary to react to increases in windspeed by easing fine tune slightly and keeping the boom on the centreline. With more traditional designs, we can use more mainsheet tension to close down the leech, and drop the traveller accordingly.

In powered up conditions, we might use a touch of backstay to straighten the foresail luff. Cunningham is eased, and in special cases the outhaul might be eased a tiny bit to give extra height, or a little more low power in choppy conditions.

As the wind increases further dropping the traveller is not enough to de-power the boat in the gusts: an extreme indication of this is excessive backing at the front as the wind exits the foresail. We need to de-power the mainsail so we can pull it back up the track. With outhaul on hard; the backstay can be progressively tensioned. The cunningham takes care of excessive creasing, and flattens the top of the sail. With backstay on harder, twist can be reduced with the mainsheet fine tune. The top telltale will be streaming all the time.

Eventually the backstay is maxed out: any more tension causes hard creases from the clew towards the middle of the mast – cunningham can't help these. The sail will invert and occasionally flog. Boatspeed will be okay, but the boat will not point. Its time to de-power the foresail (or change it!). Tightening the forestay or shrouds and lowers will probably help as well.

In all conditions, be ready to anticipate and react e.g. to a patch of bad chop (traveller down, increase speed). And keep talking to the driver.

Tacking

As the boat starts to come into the wind, pull the traveller to windward, keeping weather helm

Crew like you...

Matt Lloyd started mainsheet trimming on Sailing Logic Racing's Reflex 38 'Puma' last year.

'As a relative newcomer to this role I still find it as challenging now as I did on the first day. Most people's perception is that it is a dull job. Having done the IRC Nationals with winds up around the 30s I can confirm it is nothing of the sort.

'The role is exciting and challenging as it requires a lot of different elements including fitness, mental fitness, good all-round awareness and constant concentration. It is also very frustrating as there are so many tiny adjustments that you can find yourself getting lost trying to find that 0.2 of a knot you had on the last beat.

'It's an excellent way to learn tactics as you are in earshot of all the decisions being taken by the skipper, helm and nav. It is also a lot of responsibility as you have such a massive effect on the boat's performance upwind that if you lose a race by a very small margin you cannot help but beat yourself up.

'As for the actual trimming, after practice you definitely start to get a feeling for how much to ease, traveler down, backstay on, outhaul on... it all starts to become instinctive. If you're not being shouted at you must be doing okay, as you are the only one who can actually hear the helm or skipper shouting at you!'



PHOTO: JAMES ALLEN

on and enabling the mainsail leech to help the turn. As the load goes out of the mainsail, uncleat the old windward traveller, and drop the fine tune, or ease the sheet six inches (to twisted, acceleration mode). Before the traveller slides to the new leeward side, grab the new



Left In a smaller keelboat the main trimmer will often double up as the tactician, and communication with the rest of the crew is key.

“ Make sure the mainsheet is always ready to dump if a big duck is needed ”

windward control, and pull it on, so the boat comes out of the tack with the boom on the centreline, but twisted with the sheet well eased. Now the speed build begins, with the sheet coming on and the traveller going down in phase with the foresail coming on to full upwind trim.

Ducking

Good housework is vital, make sure the mainsheet is always ready to dump if a big duck is needed. Drop the fine tune first, so it's available later. If it's a big duck, an initial 'smoke' on the sheet will enable the helm to get the bow down. If the helmsman is trying to luff, help him by sheeting on. If he is struggling to bear away, ease more. Unless it is really light, once danger is past it's almost impossible to sheet back on too fast.

The bear away

The cunningham can be eased on the approach, also backstay in medium winds if we are overstanding. On a run, push the boom out, get the backstay off, ease the outhaul a small amount, and check vang tension. It should be eased enough to get the top telltale flowing, with the top batten parallel or slightly forward of the boom. Check the main halyard: if cunningham is eased and there is a crease up the mainsail luff it may be worth easing the halyard 20mm, especially with an old sail. If the offwind leg is not a run, the easiest way to trim the main is to ease until it starts to luff, then sheet on a little. Now cleat off the traveller in the centre, and check everything is clear for the next manoeuvre.

Gybing

In light winds, and smaller boats, simply grab the mainsheet and flick it across. The backstay may need a simultaneous flick to clear the top batten.

If the sail comes out of the gybe with the battens inverted, tension the vang and pump the boom, then re-ease the vang. In very light winds, when the spinnaker trimmers are struggling to keep the kite flying, centreline the boom to allow the kite to breathe momentarily, to re-establish flow.

In stronger winds and bigger boats, the boom has to be controlled through the whole manoeuvre. As the bow goes down, wind the boom to the leeward quarter. Take the shock out of the gybe as the mainsheet loads up, steadily easing to racing trim.

Close reaching

The mainsail is the first power control. If we are underpowered, trim as above. If overpowered, tighten the outhaul, then ease the vang, then the main, taking the load on the helm as our cue. It may be possible to save a potential broach by dumping the vang.

The leeward mark

Outhaul and main halyard can be set up in plenty of time, backstay and cunningham just before the drop. Cleat the new windward traveller in its upwind position before the turn, ensure the fine tune is uncleated, and prepare for a big wind. Trim the main on in time with the turn, not ahead. In light winds that is surprisingly slowly; in strong winds it's difficult to keep up.

Coordinate and communicate

None of the mainsheet man's jobs can be done independently of the rest of the crew. He should be communicating constantly with helm and foresail trimmer, and listening for the tactician's requirements. He needs to be in touch with the crew members who are responsible for the mainsail controls which are out of his reach. ■

Below On continuous mainsheet systems – note the winches either side – consider getting someone to back you up by grinding the other side or 'pumping the As' at the mast when rounding up and pre-start.

