



# Navigator

Can you crunch numbers, fluently read charts, absorb huge amounts of information and cope with the latest technology? Then you could make a great navigator, as **Harriet Prest** finds out...

**Above and inset** Steve Hayles, navigator on the VO70 'Ericsson', manning the nav station and working from the wireless RaceVision – a common piece of hardware on many top raceboats.

**S**andbanks, tidal currents, complicated software, rocks, marks, numbers, more numbers and a little bit of mental arithmetic – no wonder the navigator's known as the brains of the boat. But do you need to be a genius to navigate around the racetrack?

Steve Hayles thinks not – and he knows the job better than anyone. He's currently part of the BMW Oracle afterguard and has previously done four Admiral's Cup campaigns and navigated four Whitbread and Volvo teams around the world.

'This position shouldn't put off people who aren't mathematical, because I'm not particularly! Although I would recommend an understanding of angles' Steve admits, explaining the job is: 'About managing information – fundamentally what you

do is pretty simple. The role is feeding in facts, figures and numbers and trying to steer as far away from opinion as you can. There are hugely different styles of navigators. Some people come at it from a computer background and are very, very technical people. Others come from the sailing side. I try as hard as I can to be somewhere in the middle.'

Your role will depend on the boat – the number of crew may determine if there is room for a dedicated navigator and generally boats 35ft upwards will have one onboard. The style of racing also makes a difference: 'If you are racing in the Solent you wouldn't get round without a good navigator – literally!

'On a windward-leeward race it doesn't seem



like there's a hell of a lot that the navigator could do, but he's in charge of the information – what the tides doing, where the top mark is, how long it will take to get the layline, which way has the wind been tracking – managing the geometry of the racecourse. Every time you meet another boat, it's important to know where you are!

### It's good to talk

Forming part of an afterguard, the navigator needs to ensure that he fits in well with the back of the boat, especially working with the tactician. At one end of the spectrum, a small racing boat might combine the two roles while, on the larger scale, America's Cup boats potentially have five or six people in the afterguard. Whatever your size of boat, it's important to discuss what is expected of you in your role as navigator: 'Avoid the cross-over between the tactician and navigator.' Steve warns, 'I've been lucky enough to sail on an America's Cup boat with John Kosteki, Gavin Brady and Chris Dickson. We would sit down and make a really detailed breakdown of who does what: who walks on the boat with the rule book; who has the protest flag; who's in charge of what – a very, very detailed list breaking the course down to three situations: pre-start; upwind and downwind.'

Working with the afterguard is about getting inside their heads: 'Listen to what they are talking about. I wouldn't pretend that I can think like some of the fantastic tacticians – but I need to be thinking on their wavelength.' Tacticians often provide the flair but as navigator, you need to deal in fact, not fiction: 'Stick to fact: "There is a biased startline – it's number X and distance X", providing I measure it in the right way and feed it in, it's a fact, it's not my opinion – people should be able to believe it.'

So are you talking all the time? 'No, you need to know when to shut up and that's a hard one. Consider yourself as the servant of the afterguard

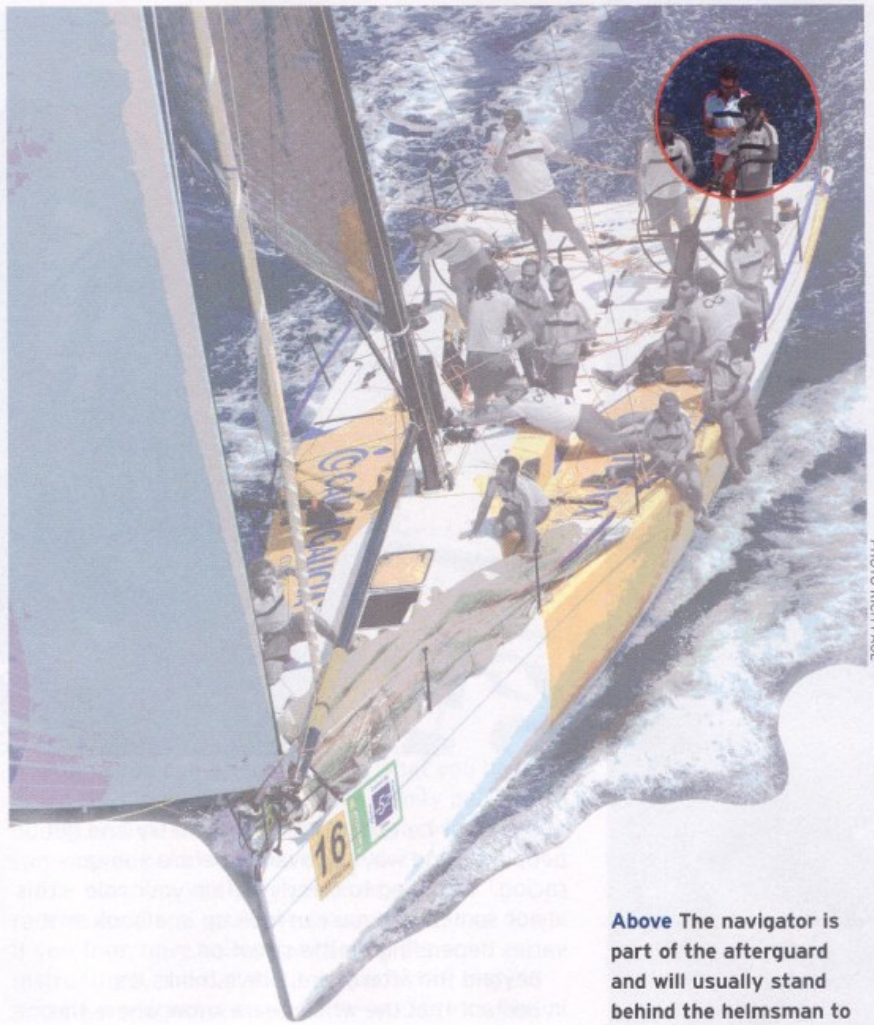


PHOTO RICH PAGE\*

**Above** The navigator is part of the afterguard and will usually stand behind the helmsman to feed information to them and the tactician. However, on smaller boats be prepared to take on a 'float' role and lend a hand at mark roundings.

– find out what people want. I'm in a classic position here sailing on "Siemens" – Ian Walker and I haven't sailed with each other for seven years and the first thing I say is, "Ian, what do you want, when do you need me? What sort of information? How much information?" He will talk ▶

**Left** You can't just watch the box! Getting information from looking around you and discussions with your helmsman and tactician are vital.



PHOTO DANIEL FONSTER / ROLEX\*



Right Offshore the role of navigator becomes even more important – prepare for every eventuality along the route.

PHOTO ERICSSON/VOIR\*



about what he expects from me. So try and get people talking way in advance before you go racing.' You need to clearly define your role – this is not something you can look up in a book as it varies depending on the situation.

Beyond the afterguard, Steve thinks it's important that the whole team know where the

racetrack is going to take them – so that everyone can plan ahead for their own manoeuvres. 'Don't make the course a secret and don't make it hard to understand. Thinking ahead and trying to understand other people's job is very important – I work very hard to say which side we are going to pull the spinnaker down on because it's important to the bow.' He adds that it's not vital to work out all the information straight away but to give everyone a good idea pre-start: 'All people want to know is are they going upwind or downwind, how many miles, what the first pole is, is it a short or long course, etc. Always imply that you are going to get more information. Every now and again, give a really concise update of what's going on.' He warns: 'You have to be prepared to be inundated

Moving to the afterguard to navigate?  
Here's our cut-out and keep guide...

# Key points

- **Dockside:** You are a 'slave' to the afterguard – make sure you know what information they need and deliver it in a clear, concise way.
- **Teamwork:** You can help the whole crew by feeding them information – if you don't have time to give them the whole course before the pre-start, give them information on the first two marks. Then they can work out spinnaker poles and drops and be prepared early.
- **Software:** The computer cannot do the job for you! And if you are going to be using new software on a new boat, download the manuals from the internet and do some swotting up.
- **Electronics:** Practice using the GPS – entering waypoints should be automatic.
- **Preparation:** The navigator's weapon is his planning. Look at the area: tides; charts; hazards. Read the Sailing Instructions before going out onto the track and get some advice on the weather before you hit the dock.
- **Upwind:** Watch the laylines. They shape the geometry of the course and you need to be able to inform the afterguard exactly where the boat is in relation to the laylines at all times.
- **Downwind:** Gybing angles vary from boat to boat and depend on the conditions, so persuade the team to check them out before the start so that you can accurately judge the downwind laylines.



PHOTO OCEAN IMAGES



with questions. People sometimes think I'm a bit of a tour guide but that's where I draw the line!

## Choose your weapons

The navigator's electronic weapons are his instruments, and it's common to see crew sitting at the back of IRC boats in racing like the Hamble Winter Series or Skandia Cowes Week with little laptop screens. Steve Hayles goes so far as to say that software is now the primary tool which most navigators use. But he has a stark warning about technology: 'Whether it's a hand-bearing compass or a custom piece of software that takes developers four years to make for an America's Cup boat – it is only a tool. Nothing a navigator can have in his possession will do the job for you.'

'I could not navigate the boat remotely. If you could send all the information off the boat and I could watch it in an enclosed room – I would not have a clue what was going on – you've got to be there, experience it, look around. They are just really useful and good tools.'

Great if you know how they work, but how do you find out? 'I spend an awful lot of time at home with the software. At the top end a lot of the systems are the same but I might have to get on a boat and learn very quickly what their systems are. If I haven't used the GPS before I will download the manual for it – you can find these things online – just make yourself aware of the boat.'

Most boats have integrated instruments – Steve admits they are essential: 'It would be very hard to race any boat 30ft upwards without any instruments. You need to know how fast you are going, you need to know your heading, what the wind is doing. These instruments vary massively depending on how much you spend on them and how much work you do on them.' And he gives a top tip for learning about the software and the instruments: practice! 'With a GPS you have got to understand a lot of the terminology around it. You've got to be very conversant with it – you will need to place waypoints (of a mark, a buoy, or headland) and if you can't put that information in as almost second nature then it's hard.'

## Do your homework

Steve is really big on preparation and planning in order to be as effective as possible. 'You want to be knowledgeable on the area you are racing in and to turn up having worked really hard – make yourself really comfortable. Understand where things are: is it rocky or muddy or hazardous? Get some information on the geography and the layout as when you turn up on the dock and leave for the first time, people expect you to know where you are going! Imagine sailing in the Solent if you have never been there – what would you have to do in terms of preparation to make yourself comfortable with the area? The answer is, of course, that it would take some serious preparation to learn about the tides and the Brambles Bank!

The internet is a useful tool for preparation: 'All the information you find – collate it! Get the information and put it in folders: I have a folder for every single boat I've ever been on, within that is every single regatta I've ever done and that's split up into tides, weather and other things. You need to get information that you understand simply.

## Crew like you...

...top amateurs share their secrets

■ 'Almost nobody has their true wind calibrated properly – this is the navigator's responsibility so learn how the particular system/software works on each boat you nav on. Record true wind calibration graphs from every boat so you can set up a similar design quickly. The computer is only good for solitaire if the true wind isn't calibrated!  
'Always carry a USB stick with all the SIS/charts/weather GRIBs loaded on it in case the paper copies go AWOL.'

James Day, navigator, Rogers 46 & Farr 45

Anything you can do to minimise what you have to do on the racecourse, the better. Ninety per cent of questions you will be asked on the racecourse, you can answer before you leave the dock.'

Pre-planning will gain you time on the racetrack: 'Once you have taken the course down, if you then have to look at the Sailing Instructions, then at the position of the marks and then programme the GPS – you are on the back foot and in trouble straightaway.'

Get the relevant information up on deck as soon as possible. 'Get your time management right, come up on deck and say, "This is where we are going but I've got a bit more to do." Ideally I'd be drawing on a race marks chart as the course comes in and I'd then quickly go up and brief everybody – then the bowman gets his first pole call.

'I do all the tidal calculations beforehand. I have a paper chart with all the tide heights worked out and written on. The navigator has an input into the weather – on a lot of programmes he is entirely the weather man. If that falls into your remit, then you've got to start working really hard – maybe weeks ahead. If you are not a meteorologist, do not pretend to be one.

'There's a monstrous amount of work that isn't used – to take an example like the Volvo Ocean Race, I set off with a ridiculous number of charts because I have to be able to take the boat into any headland and be knowledgeable about it.'

## Feeding information

Although planning is paramount, what about sailing around the course: pre-start, upwind, downwind, and boat-on-boat? 'You need to keep track of the course geometry – the edge of the course is defined by the laylines – and then be aware of where the boat is within that shape. It is relatively easy to do with software but the tactician needs to know upwind, for example: "We are coming together with another boat on port tack... it's fine to dip if we are in the middle of the course but if we are only 30 seconds from the starboard layline, it's not the right thing to do." You will hear pros talking about the times of the

Far left Many large yachts now have wireless ruggedised laptops for use on deck.



splits – which is basically how much time we've got left on port and starboard to the layline. It's critical and it paints a picture to the afterguard about where we are on the racecourse.

'The navigator can look at the tide and the software will tell you how far to the layline, but I can guarantee that it won't get it right – you can't get the calibration right. A lot of it's about tracking what you've been doing. The sort of questions are: what phase are we on with the wind, what's the mean wind direction and are we a little bit left of that or right? What are we tacking through? It makes a big difference and it depends on the windspeed. What the tactician wants to know is what's going on? When we tacked last time, what angle did we tack through? Often it's nothing more than looking at the wind instruments at the right time, or the GPS. You can do a lot of it mentally. What you can't do is go back if you haven't been thinking about it. Use a notepad and track what headings you have been on.

'For a long time I wore two watches – so that I could time how long we were on port and starboard. Now that might seem like a simple thing but getting to the top mark and finding you've spent a lot more time on port than starboard tells you a lot about the run. There are lots of things you can do without having the best software.



PHOTO: BENNOT STICHELBAUT / JDPPI

**Left** Being able to concentrate in the middle of a busy cockpit is an important skill – your 'desk' will be pitching, rolling and getting wet.

## “ You can answer 90 per cent of questions before you've left the dock ”

'When asked for information, there's a required level of accuracy for any answer – and you need to understand what that is, and not be overly accurate when it's not required. At AC level we get really forced into it – try and be really short, clear and simple when you communicate so you are not just babbling on.

'Think about it beforehand, when should you say it, how should you say it? Coming off the startline and saying that there are seven minutes and 42 seconds to the windward mark is irrelevant. It doesn't mean anything. All they want to know at that stage is, "What's the longest tack?" The computer's always giving you numbers – but what changes as the course develops is how you say it. At the bottom of the course all you really want to know is which leg is long. You say "The course axis is X and the wind direction's X and there's more port than starboard." When you get within three or four minutes of the windward mark you need to get more accurate and try and talk in seconds or boatlengths.

'It's all about preparing for the downwind leg while you are going upwind. Getting to the mark and then going, "Now what happens?" is not the right approach. Again you need the basic course geometry. Are you going to be able to sail all the way down the run on one gybe? Do you need to do a gybe-set or is there going to be lots of gibing? Try drawing a racecourse and imagine sailing round it. Draw all the different dimensions – understand what downwind laylines are and why boats gybe. The first questions a navigator is going to get within a few seconds of going around

the top mark are: "Which way is long? What are the splits? What are the times?" Again, you don't need to be accurate: "Its even or, it's slightly longer on starboard," for example.

'If you have something in your mind just before the tactician asks you, then you've done a brilliant job. Don't tell him just because you know it!

### Things that go bump...

So, do the pros ever get it wrong? Steve gives an example which you should not try at home: 'In the 1999 Admiral's Cup onboard the British new 50-footer "Venture 99" – sailing with lots of good guys – Lawrie Smith, Ian Walker, George Skudos – we absolutely piled the thing onto the bricks around the back of the Isle of Wight on a round the island race – really badly. Huge mistake.

'As boats get faster, to be honest it's almost my biggest fear: a really fast boat going aground at pace would be a really scary prospect now. I've run boats aground that I shouldn't have, and I've been too cautious and lost places – so it is a tough trade-off. You've got to evaluate the boats, the people, how you are doing, what regatta you are in – every situation is different – that's what makes it a tough job.'

Steve's final tip is simple: 'If you want to be a navigator, practice working out reciprocal bearings – the opposite of 360 is 180, 90 is 270 and all the other numbers in between. Get them in your head. On a startline, you can't guarantee you will take your bearing from a particular end so being able to add up and subtract is important!' Back to your maths again. ■