



**WIN A DAY WITH THE AUTHOR**  
 Duncan Wells is an RYA Instructor and principal of Westview Sailing and now a sextant-ist.  
 Email [duncan.wells@sailingtoday.co.uk](mailto:duncan.wells@sailingtoday.co.uk) with your answer to the sextant reading (see page 101).

Stokey's Gestapo impression received a mixed response.

# Putting the 'sex' back into sextant

Astro navigation can seem like a bit of a mystical, unattainable art and, for many years, 'Stokey' Woodall patiently tutored aspiring navigators aboard the P&O ferry *Pride of Bilbao*. **Duncan Wells** went out on his final voyage to pick up a few tips.

I have always wanted to master astro navigation. I can understand the concept of navigating with the use of three pencils in a triangle and keeping one pointing at the pole star while another points at the horizon, so you sail down a parallel of latitude – just as the Vikings did. I can even handle the idea of going north where the pole star will be higher than your set angle on the pencils or where it is lower and you have gone south. All

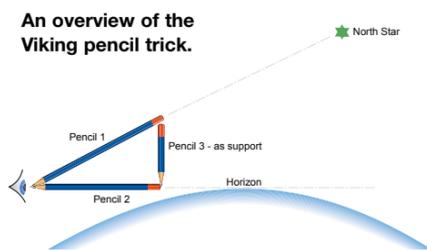
you have to do to get home is to place the pole star back in line with your top pencil and the horizon with your bottom pencil, then sail along this parallel to get there. But I wanted more. My boat came with

a Davis Mark 25 plastic sextant (Pic 1). I downloaded the instructions and worked out how to set it up, adjust it and to read off an angle of the sun or a star, but the next bit had me flummoxed. How on earth do you reduce a sight to come up with a position line? The manual couldn't explain it to me.

None of the so-called expert and easy to comprehend books from 'Oceanmaster this' to 'Celestial Navigation that', made any sense. I turned to my mentor, Eric Hiscock, who wrote that he got his info from Claud Worth and that his was the simplest explanation. So I bought Worth's *Yacht Navigation and Voyaging*, but I got lost at the first mention of cosine. I found that, without fail, every single book on the subject either did not lead you through in a logical progression or made assumptions and jumped steps. A worked example using excerpts from the tables would be



Davis Mark 25 Sextant – condemned by Stokey.



Pic 3: National ensign of Nassau in the centre. P&O/Owner's flag on the port yardarm. Courtesy flag, Spanish ensign on the inside of the starboard yardarm and outside this the 'H' flag for 'I have a pilot on board'.

## Bilbao

We arrived in Bilbao just after dawn (Pic 2). Wearing all the right flags (Pic 3). And for some ridiculous EU reason they make all passengers get off, so we had a couple of hours to kill. I could have done with a lie in. At 7.00 on a Sunday morning we found ourselves on the dockside. For want of something to do we taxied into town and went to admire the extraordinary architecture that is the Guggenheim Museum (Pic 4) and Jeff Koons' Cat (Pic 5), which is made out of live pansies (Pic 6).



followed by an example for which there were no tables shown in the book, which is useless, because one needs to check one's workings as one goes. For these books to make any sense, one already had to be an expert astro navigator. It is almost as if the teachers want to keep astro as an almost mystical 'black art'.

I knew that I needed help if I were to stand a chance of getting a handle on this and help came from an unlikely source...

## Saved by Stokey

I had heard about Stokey Woodall and his astro classes aboard the P&O ferry *Pride of Bilbao*. What a good idea I thought, having a ready made and reasonably stable platform from which to practise taking sights at sea. The course lasted for as long as it took the ship to get from Portsmouth to Bilbao and back and with the *Pride of Bilbao* retiring from the Portsmouth Bilbao route, this would be Stokey's last course on board. The end of an era: I determined to book my place. All signed up and ready to go, I asked Stokey if I should bring my trusty plastic sextant? "No," he said, quite sharply I thought. "You can leave that at home."

Do you know what? Over the three days, I got it. I actually understand how to reduce a sight, how to use the tables, how to come up with position lines and how to find out where I am. I haven't a clue about the physics or what's really happening, but that doesn't matter – I



don't know what's going on inside a GPS or a satellite either. Now I can navigate by the stars, the planets and the sun. Shackleton's navigator on the *Endurance*, Frank Worsley, was getting an accuracy of within 1' which is 1 mile, while he was being tossed about on the *James Caird* as they made their way from Elephant Island to South Georgia, which is phenomenal.

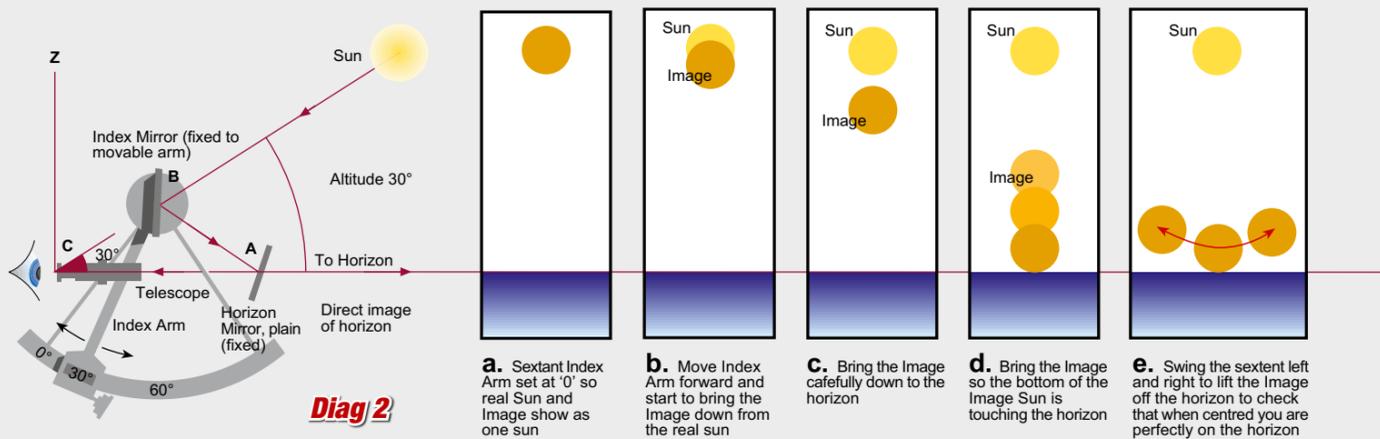
I can't say I am quite there yet, but I'm getting reasonable accuracy from my more stable boat in the Solent. I can now use my sextant – upgraded to a fine

Astra 111B (Pic 7) – to verify the accuracy of my GPS. And if someone does switch off the GPS signal for any reason, I shan't be too bothered. Of course, it's incredibly handy having a digital readout 24/7, especially if it is overcast, and I wouldn't swap it for the world, but now I am not wholly reliant on it for finding my position and I like that sort of independence.

I am beginning to learn and read the stars – not with the same detail of a Patrick Moore or in the same way as a Jonathan Cainer – but the Plough with Dubhe and Merak pointing at the Pole Star now tell me the time. Yes, if you have no idea of the time you can use the celestial clock and you won't be more than 30 minutes out, which isn't bad. We may all have a zillion digital watches that are accurate to within a nanosecond every billion years, making the celestial clock more of an amusement than a practical timepiece, but you never know. After all a volcanic dust cloud closed our airspace last spring, so you don't know what nature has in store. I just love the idea that these planets and stars are millions and millions of miles distant.

## Making astro achievable

I was concerned for Stokey lest we find that the sky was overcast throughout the three days. However, as he despatched the principle of setting up the sextant and taking sights within the first half hour, »



Diag 2

**Taking a Sun Sight.**

How do you take a sun sight? (Pic 11) Either you can set the index arm on the sextant to zero, then with both sets of shades – for the index mirror and the horizon mirror – to protect your eyes, point the sextant at the sun and look down the eyepiece. (Diag 2) Once you have the sun in sight (a) move the index arm forward gently and you will see a second sun start to come down below the main or first sun (b). You are bringing the image of the sun down to the horizon with the index arm (c and d). When you have it near the horizon move from the index arm to the knob of the micrometer gauge and turn this gently until you get the bottom (Lower Limb LL) of this sun exactly meeting with the horizon. (e) Swing the sextant gently from side to side and you will see the sun rise off the horizon as you swing the sextant to the left, dip back to touch it in the centre and rise off as you swing the sextant to the right. Keep adjusting the micrometer so that the sun is just touching the horizon and take the time. You have to be quick about it, because the sun is on the move and it is rising or falling

very quickly and won't be touching the horizon for long. Within a few seconds you will have to adjust the sextant micrometer to keep the sun on the horizon. Now read the angle from the sextant. The main reading from the arc gives you degrees, the micrometer gives you minutes and fractions of a minute to 0.2, 0.4, 0.6 and 0.8 in the case of my sextant. As you can see (Pic 12) this sextant reading was more than 41° but less than 42° on the arc – so that will be 41° and some minutes – and then from the micrometer scale which gives us the minutes and where we have a fixed scale running from .0, .2, .4, .6, .8 etc on the right hand side, we see that the .0 line is just ahead of the 16' line (Pic 13) on the micrometer, but not past the 17' line, so our minutes are 16 and the tenths will be whichever of the .0, .2, .4, .6, .8 marks lines up best with something on the micrometer scale. If the .0 mark lined up perfectly with a mark on the micrometer scale then we would have the exact minutes; in this case 16 minutes and no tenths. However, it's the .4 that lines up with a mark on the micrometer exactly (Pic 14), all the others



are slightly out, so .4 it is and the angle of the sun at the time we took the sight was 41° 16'.4. And there is nowhere that I have ever come across that has explained how to read the arc and micrometer scale like that – a way that means you can actually do it.

**Prove me right:** Here is another reading Pic 15. Email me your answer and I am sure you will be right. I will let you know. I'll put all the answers in a draw and the winner will have a day out with me on my boat, *Dorothy Lee*.

For the more 'pro' feel you can set the sextant to the approximate angle of the sun first and then you should find it on the horizon all ready for you. And here's how you do that. With your thumb folded into the palm of your hand, stretch your arm out in front of you and the width of your hand is roughly 8° at the horizon (Pic 16).



15: What is this reading?



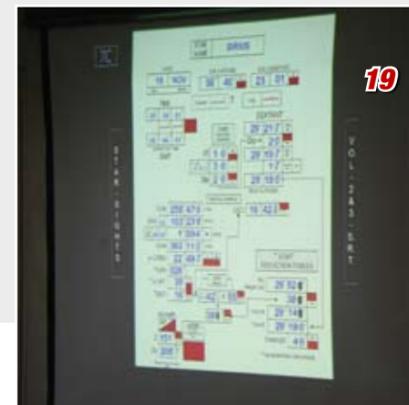
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One finger on an extended arm is about 2° (Pic 17). So, measuring from the horizon to the sun, work out how many times it takes your hand or 8° to span the gap (Pic 18). However many that comes to x 8° is the angle of the sun, roughly. Set this on the sextant index arm and when you look at the horizon you should see the sun. Adjust the micrometer to add the finishing touches and get the accurate angle. Note the time and that's your reading.

**Best of luck!**



Reducing a star sight – Sirius.

(main photo and Pic 8), I realised that taking the sight was not actually that difficult, while better quality sights tend to come with practice.

The major part of the exercise is reducing the figures to give you a position line (Pic 19). Like all great teachers, Stokey takes the subject and breaks it into bite-sized chunks that we can all absorb and he makes a complex subject as straightforward as you can get. Within a short time we were working through the figures. We understood what we were doing and we were enjoying our successes, both of which are absolutely key when it comes to teaching. Stokey Woodall has been running these courses for years and he's taken hundreds of



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ordinary people and made them masters of their own navigation.

**The bridge visit**

Stokey is very well known within P&O circles and he said that if we were lucky, the Captain might invite us to the bridge. Coincidentally we had three P&O cadets on the course with us, which apparently helps in these matters, and so it happened that we received the invite. And what a charming man Captain McFadyen is (Pic 20). He gave us the run of the bridge (Pic 21) and answered our questions. One of the students was concerned to know if the *Pride of Bilbao* would actually give way to a sailing boat. I could sense the more experienced sailors in the class stiffen at this question and the Captain handled it brilliantly. He graciously pointed out that apart from him and the Officer of the Watch, there was always one member of the bridge team on

permanent lookout. Add to this the whale and dolphin watching team (Pic 22) who travel with the *Pride of Bilbao* and give lectures on board and the radar and the AIS (Automatic Identification System) and you have a very sophisticated and thorough means of keeping a very



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## SEAMANSHIP



vigilant lookout at all times of the day and night.

In fact, although leisure sailors often worry about how commercial shipping will respond, especially when crossing the Channel, it has been my experience that they always abide by the collision regulations. The tricky thing is establishing from a yacht what sort of course alteration the ship has made. An alteration of 3°-5° is not easy to tell with a handbearing compass and it takes time to establish what the ship is doing. This is why having one's own AIS is invaluable, because it will tell you immediately and will give you a graphical display, so you can see that they have altered course to avoid you. Given that their radar and tracking systems are likely to be much more accurate than yours, you should hold your course and speed. However, there is a worrying trend amongst some commercial shipping to consider that 3 cables (555m) is sufficient distance between them and you to avoid a collision. The MAIB is concerned that



this is cutting things too fine and, if you are in a small yacht and a large container ship is within 3 cables and heading in your general direction, she does have a tendency to look terrifyingly big.

For further entertainment on the return trip from Bilbao, the Royal Navy laid on a display, because their Lynx helicopters from a nearby warship were given permission by Captain McFadyen to practise hovering a few feet above the upper deck while 60kn of wind was blowing across it (Pic 23). It was a very impressive display and a sight enjoyed by everyone on the *Pride's* swansong



voyage. She is currently laid up in Falmouth.



### Home to Portsmouth



24: The homing beacon that is the Spinnaker Tower. 25: Home, you get a good view from the top deck. 26: It's a busy old stretch of water. 27: Spot on the 'White' sector of the direction light



### If I can do it, anyone can

So that's it, you don't have to be a genius to use a sextant and to reduce the figures. In terms of navigation it's a lot more 'sexy' than a GPS and you can derive a great deal of personal pride from being able to find your way by the sun, moon, planets and stars.

Putting 'sex' back into the sextant is the slogan of Stokey Woodall and [www.internationaloceanservices.com](http://www.internationaloceanservices.com). Stokey can be contacted on 07547 163231. He now runs courses from his new home, affectionately nicknamed the 'Sky Lab' near Bonchurch on the Isle of Wight.

Right, I am just popping out to take a noon sight. I've checked the Meridian

Passage for the day, applied my longitude west of Greenwich and know when the sun will be at its peak at my location. All I have to do is to take sights from 10 minutes before until 10 minutes after and the highest sight will be the noon sight and from that I can work out my latitude – and I can always have a quick peek at the GPS to see if I've got it right.