



# Blind navigation

A foggy notion for Yachtmasters, or a useful seamanship skill? David Pugh investigates

**B**LIND NAVIGATION. Two words that have struck fear into the hearts of countless Yachtmaster candidates – but why? What's the point in sending the would-be skipper below to the chart table to navigate, while he or she could probably do it better by eyeballing a few marks ashore?

The usual RYA excuse is that it shows the candidate's ability to navigate using traditional methods in restricted visibility, but most instructors see it more as a demonstration that their charge fully understands the wealth of information available to them without the aid of electronics, especially positioning systems such as GPS. Viewed that way, blind

navigation could be a useful exercise for any sailor, Yachtmaster candidate or not.

## Eschewing satellites

If the GPS goes haywire, what are we left with? These days, the answer is quite a lot: log, speed through the water, depth, wind direction and speed, time, sea temperature, compass, almanac, charts and, given adequate visibility and proximity, marks ashore. With the latter, two or three bearings taken with a compass, or a bearing crossed with a range deduced from angular elevation with a sextant, can give an excellent position for navigation (see '14 ways to get a fix', PBO November 2015).

Take away the visibility and, however



Crossed bearings give a good position fix

tempted one may be to panic, only one of those sources of information has disappeared. Complete loss of power is more serious as most modern boats will then lose all the above bar the time, compass, charts and almanac – enough for good visibility, but not for bad. For that reason, it's worth carrying a leadline and



some kind of method for assessing distance travelled, be that a Walker log or a log line, or simply practising your ability to accurately estimate speed through the water.

At the other end of the spectrum, radar offers a powerful means of navigation in poor visibility. Buoys and coastal features stand out well, while bearings and ranges are accurate and swift to take. Unless your instructor gives marks for ingenuity you probably won't pass a Yachtmaster blind navigation exercise using radar, but if you have it, take the time to learn to use it for more than just ship spotting: in practice, it's likely to be your first port of call if the GPS goes wrong.

For this article and the RYA exercise however, we're just concerned with the loss of GPS on a boat without radar, so let's take a look at what tools we have and how we can use them.

### Log



A key piece of navigational information since man first ventured away from shore, distance run is only equalled by course in

navigational importance. If you know the distance you have travelled through the water, with the aid of the almanac you can easily adjust it for tide to find out how far you have travelled over the ground.

### Speed through the water



Multiply this by time and you get the distance run. By and large, it's easier to measure speed than distance, so most traditional methods

rely on an accurate means of timing a set period – for many years, the half-minute glass provided this.

### Depth



Whether obtained with an echo sounder or a leadline, this is one of the most powerful tools we have for determining

position when coastal sailing in poor visibility. Charts show accurately plotted contours, usually at 2m, 5m and 10m, which can provide accurate position lines when adjusted for tide. If you know where you are and a contour will take you where you want to go, that's all you need to follow – although the route may be a bit circuitous!

### Wind direction and speed



Although not generally viewed as a source of navigational data, wind speed and direction can be useful in assessing and allowing for

leeway, as well as for planning your passage to make best use of the breeze. Fog and wind are not best friends, however, so its usefulness may be limited in practice.

### Time



The third element of the distance/speed/time triangle, an accurate means of timing intervals is essential. For example, in a blind

nav exercise it may be easier to ask the helmsperson to motor at a constant speed for a set time than asking them to cover a specific distance through the water.

### Sea temperature



This may not be particularly useful in coastal navigation, but ocean sailors use sea temperature to find the well-charted

boundaries between ocean currents, giving a rare opportunity to obtain a mid-ocean position line. In coastal waters, outfalls from industrial facilities such as power stations may provide a localised change in sea temperature close to the pipe outlet.

### Compass



Together with the log, this is your best friend in poor visibility. We've all spent night passages glancing at the compass, and with a careful

calculation beforehand, a course-to-steer can result in a remarkably accurate landfall. For blind navigation close to shore, you'll need to keep a careful eye on your course to help maintain an accurate estimated position.

### Almanac

For blind navigation, you'll need to calculate the tide height where you are. One way to do it is to check your sounder



against a charted mark, which works well for a short exercise, but to sail further you'll need rates and sets from the almanac and charted tidal diamonds or a tidal stream atlas.

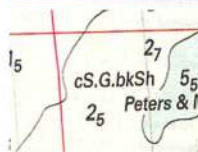
### Charts

Without these you really are lost. Make sure you have detailed charts of the areas in which you sail, and keep them up to date. In popular waters such as the Solent, racing marks can be useful, well-charted points to aid navigation, but as they are usually named after sponsors some will change their names annually – another reason to update!



Detailed charts are essential for navigating close to shore – but keep them up to date

### Sea bed



Coarse sand, gravel and broken shells

Although not listed above, a traditional and effective way to find an approximate position close to shore is to take a sample of the sea bed. Lead lines usually have a hollow in the base of the weight which can be 'armed' with tallow. This brings up a sample of the sea bed, which can be compared with the chart to help confirm that your calculated position is correct.

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Planning your course to cross contours...

contours, until we reached a point where we could sail straight across the Solent to another mark just uptide of our destination before following another contour to the creek. This approach had several advantages:

- It ensured that we maintained the best fix possible.
- While sailing along the contours, we were sailing with the tide, so could simply add the rate to our speed through the water.
- For crossing the Solent, the CTS calculation was relatively simple, just requiring an offset for tide across our course.
- Making landfall uptide of your destination gives room to correct your position if your landfall isn't spot-on.



...gives multiple position checks as you sail

### Going upwind

Tacking is the enemy of an accurate EP, but there are things you can do to minimise the error if you're forced to beat.

Firstly, make an allowance for leeway. On a beat this will be at its maximum, and will vary according to the wind strength. If it's your own boat, you probably know how much leeway she makes; on a strange boat, ask the skipper if possible, or assess it from the wake.

Secondly, keep everything even. On a dead beat, sailing for the same amount of time on each tack should keep your course through the water directly into the wind. If there is a making tack, take note of the time sailed on each tack and keep updating your EP. As above, working in six-minute intervals can help here.

## PBO conclusion

**W**hether or not you have any intention of sitting a Yachtmaster examination, blind nav is a useful exercise to carry out every now and then. It's very easy for your paper navigation skills to become rusty if you normally use a chart plotter, but to successfully navigate close to shore you need to be quick.

That means practising techniques and shortcuts, and generally maintaining a feel for your boat and how she behaves in different conditions.

From our own exercise, I discovered that my own skills were distinctly rusty and our charts needed updating, with a secondary port calculation taking far too long, and the chart claiming names for Solent marks which were at least two years obsolete. As a result, I'll be getting out the books and the magenta pen – and trying to do at least one exercise a year in future.



Peters and May was actually Seven Sisters

## View from an instructor Clive Vaughan of Universal Yachting

**B**lind Navigation is as much a test of a candidate's ability to perform traditional methods of navigation, estimated positioning etc as it is to recreate the reality of what you might do when caught out in fog.

The reality of navigating in fog is that you would use all means to ensure safe passage, including good watch on deck, use of electronic navigation aids etc. In all probability, the last thing you would do as skipper is to tie yourself to the chart table.

While it can be argued that the relevance of traditional navigation methods is becoming less important with the advent of modern electronic mapping and chart software on a range of devices, there is still an importance to demonstrate

one's ability and show that a candidate understands and can demonstrate traditional navigation methods. In essence, this is what the blind navigation exercise is used for during an exam.

So if asked to do a blind nav exercise, think of it more as a navigation exercise using Estimated Positioning (EP) and your ability to use depth and contours as a means of calculating your position.

But don't feel that you will fail if you haven't achieved accuracy within a few metres. An examiner will always take into consideration such things as the competency of your crew and the conditions, whether you are under sail or power. It is also very unlikely that an examiner will fail a candidate on just one specific incident. Normally, candidates who do not make the grade

lack experience in their overall sailing and skippering – it is rarely just down to one thing.

It is also an interesting exercise for any examiner to see how the candidate reacts in a pressurised situation.

### Helpful hints

- Check the accuracy of your log and depth sounder.
- Ensure the compass has been swung recently.
- Practise your mental maths and speed distance calculations in advance.
- In a short test, you just need to know the tidal height at that time of day: the easiest way to do this is to check your depth against a known mark on the chart, such as a buoy. Be aware, however, that over a longer period of time you need to adjust your calculations as the tidal heights change.

### Other things to consider

An examiner is also looking to see what you will get the crew to do in a supposed fog scenario, so don't forget all the other good practices, such as:

- Nominating a lookout
- Ensuring all on board are wearing lifejackets
- Getting the foghorn out on deck and using appropriate signals – slowing down
- Turning on navigation lights.

It is also worth clarifying with the examiner what it is he is asking you to do. Don't assume anything: quite often candidates will be asked to navigate from A to B simulating that they are in fog, only to be asked afterwards why they didn't use their GPS.