NAVIGATING OVER LONGER DISTANCES

Paul Glatzel discusses managing longer offshore passages in the wake of the Round Ireland 2013 Challenge – a perfect example of what can be achieved in smaller well-prepared boats.

As is the norm with such events, it is the responsibility of each individual boat's skipper to plan his/her route between the start and finish point each day, taking into account the various navigational challenges along the route. Of course, in reality, while the flotilla of boats may have individual plans and distinct waypoints/routes, when the boats start to congregate into smaller groups and they get going, one boat tends to take the navigational lead for each group. This doesn't take away the need, though, for each individual boat to still have their own plan, because, as the Round Ireland 2013 event showed perfectly, the boats can get separated from each other, so need to be self-sufficient at all times.

So what methods can realistically be used during longer offshore passages, given the difficulties of navigating in smaller craft that are likely to be bouncing around, not have a dedicated navigation station and, as in the case of almost all the boats on the Round Ireland 2013 event, be very very wet?

Without question, the primary means of getting between two points in open water tends to be to use a chartplotter/GPS unit. Over the last few years, chartplotters have come down in price, screens have got bigger and more glitzy features have been added, but the fundamentals of a chartplotter remain the same. Basically, they allow you to enter a series of waypoints, link them to form a route, then navigate along the route between the start and finish point – a great technique that works really well.

Going back a few years, the way that we all created a route on a chartplotter was to work out the latitude/longitude of our preferred waypoints on a paper chart, enter these manually into the unit, then link them into a route. The norm nowadays is to plot a route by moving the cursor around the screen and enter the positions that way. If you are doing it like this, be really careful to follow the route closely on the screen to see whether there are any dangers close to the route that you didn't spot when entering it.

Running a route is simple but there is always the risk that the chartplotter will go wrong in some way, and when it does you can be sure that it will be at the most inopportune moment. A good skipper will therefore be running a route but using a secondary method or two to be sure that they are where the chartplotter says they are.

TOP TIP

When following a route, don't become fixated on staying on the direct track between the two waypoints. Work out what an acceptable distance off the track is ('cross-track error'), note the heading and then steer using the compass keeping roughly on the heading. From time to time, check your cross-track error and if needs be make small heading adjustments to slowly ease back towards the intended track. Doing things this way keeps your head up and eyes on lookout rather than down and at risk of missing another craft or perhaps a pot.

There are various ways of doing this but remember to keep navigation as simple as possible – if you can see a lighthouse roughly 8 miles to the north of your position and there are no other lighthouses around then you can be pretty sure where you are without using other techniques.

Having a secondary GPS system for use when offshore is essential. In theory, a handheld GPS unit can be used to plot your position by transferring the latitude/longitude to the chart, although in reality that is nigh on impossible in a small craft. Far better (and simpler!) is a technique known as the 'bearing to compass rose' method. This is probably my preferred option when in smaller fast craft offshore as it is 'quick and dirty'.
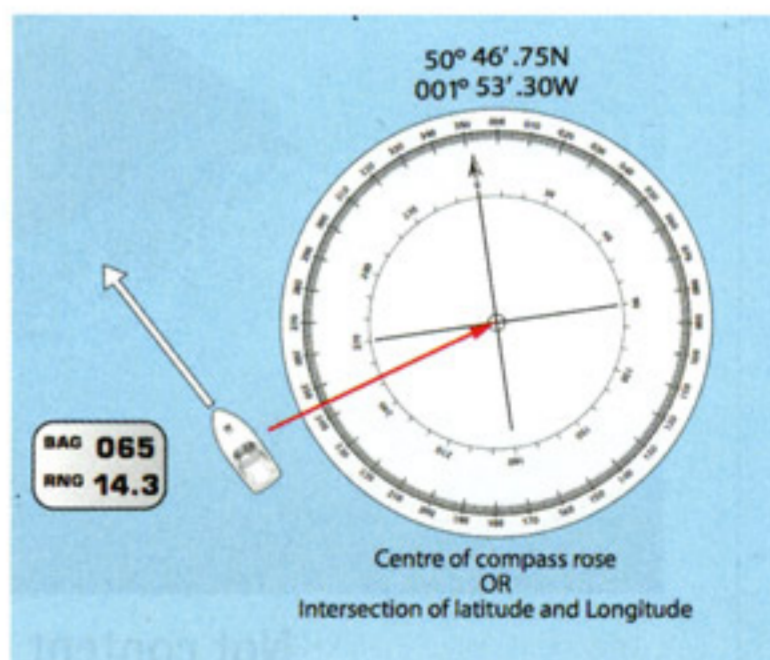
Above: Bearing to compass rose

Enter the centre of the nearest compass rose on your 'paper' chart as a waypoint and select 'goto'. Configure the unit to display i) distance to waypoint, and ii) bearing to waypoint . The

chart you are using for this will need to be able to survive in an open boat, so consider using the Imray charts, which with their plasticised paper are great. You then use your fingers/hand and the compass rose to roughly plot your position onto the chart (remember that the bearing is towards the centre of the rose, so be careful not to plot the reciprocal [opposite] of the bearing).

NOTE: Of course, your fingers/hand will never be perfect as a plotting tool, but with practice you can get pretty good. If you can use a small square plotter (sometimes known as a 'RIB plotter'), then that's even better.

Ideally you would mark onto the chart the position, your current heading and speed and the time you took the fix. The reality in a small, fast boat is somewhat different, though, and if you can just mark the position you may be doing well. A technique I have employed when using this method was to press small bits of Blu-tack onto the chart as a means of marking the position as waves and spray were breaking over the RIB as it progressed at speed in challenging conditions. Very unorthodox but it worked, and we had a line of small bits of Blu-tack on an A4 sheet that we knew we had attached every 10 minutes – we just had to be careful not to knock them off!

An alternative to using a large Imray chart, which you will need to fold to make usable, is to create a series of A4-sized laminated chartlets, each with a compass rose in the corner, which you can use as you progress along your passage. A chinagraph pencil can be used to mark the laminated sheets.

Another GPS-based method is a technique called the 'waypoint ladder'.

Waypoint ladder

WP 2
1M
1M
1 2 3 4 5 6 7 8
WP 1
XTE : 0.5 M
RANGE : 5.5 M
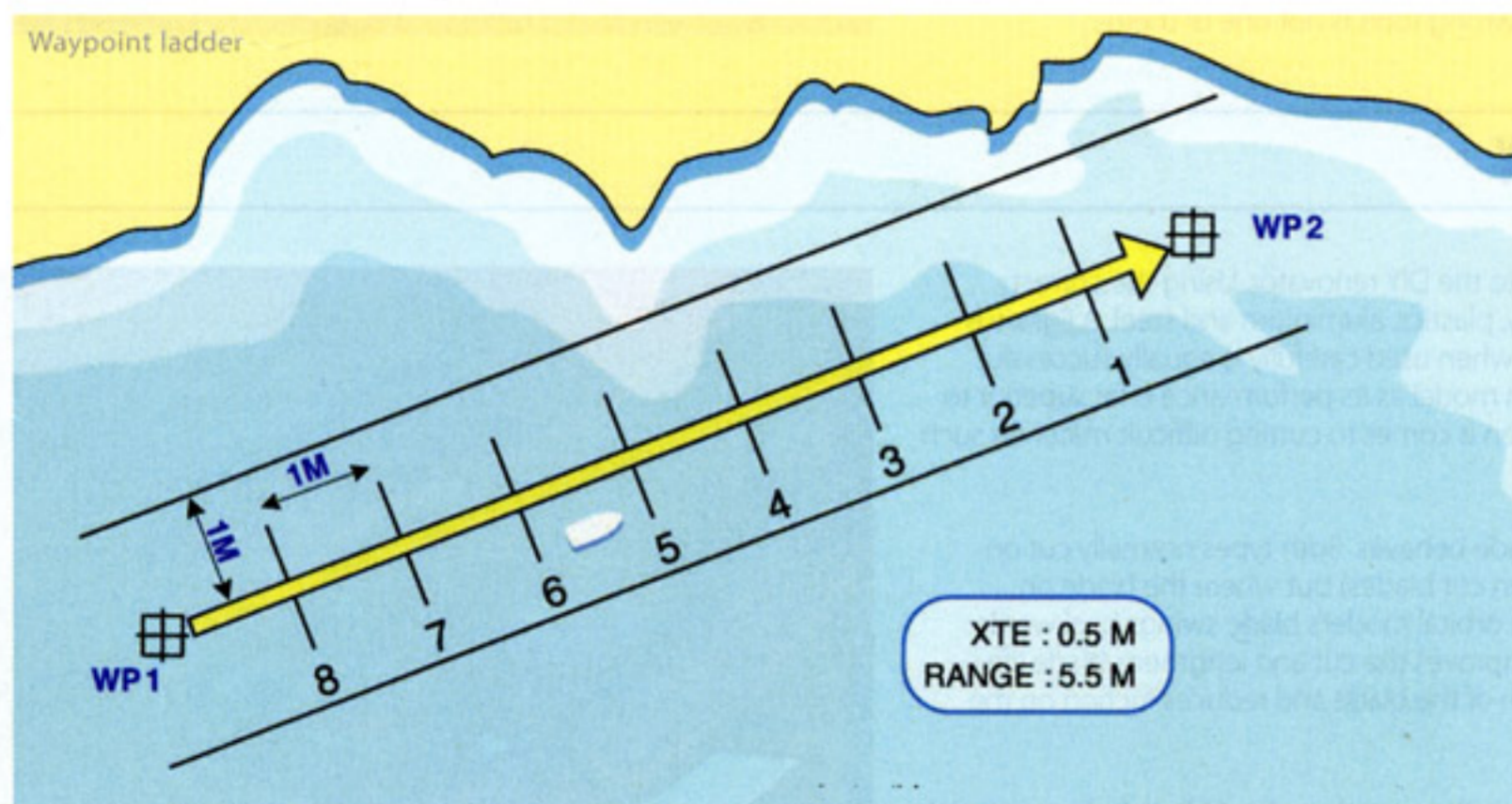
This requires you to prepare a chart before you go afloat by marking your waypoints and route; then you can use the distance from your target waypoint and the 'cross-track error' (also known as 'XTE' or 'off course') to mark your position.

What I really like about these two techniques is that they integrate the best aspects of using electronic techniques with the benefits of a 'paper' chart. By regularly checking your position on the chart you can easily check that you i)

are where you should be, and ii) aren't near an area of danger that you haven't spotted on the smaller chartplotter screen.

There are other methods that work well:

'Dead reckoning' has been around far longer than we and our chartplotters have and is a simple, quick technique. Imagine we are heading on a course of 180° from a headland across an open bay. If we check our chart and mentally mark on the course, then measure off how far we have travelled on that heading since the headland (e.g. at 22 knots in 30 minutes we have travelled 11nm), then again we get a pretty good indication as to our location. We can factor in tide and the effect of wind (leeway) for a more precise position.

There are various other pilotage techniques that we have addressed in previous articles that might work well if you have some sight of land or if the depth is varying. A couple of techniques we haven't touched on previously are the use of radar and AIS.

AIS is best known as the system fitted to vessels that sends out their identity, position, heading and speed. What became obvious going around Ireland was that AIS beacons are increasingly being fitted to navigation marks or features. So while we may have been too far offshore to see the particular mark that the AIS was identifying, we could work out what it was from a chart, and so, with our bearing and distance to it from the plotter, had an indication of our position that we could plot on our chart. This is essentially a variation of the 'bearing to compass rose' technique.

Radar is a great tool when offshore as aside from the benefits of spotting other craft it can give you a picture of the shore from afar that you may be able to marry up to a chart, giving you yet again another rough idea of where you are. As you get closer to land, if the shore is well

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defined (vertical cliffs rather than flatter shores), then the picture can get even better. Don't forget either that the 'variable range marker' is great for measuring distances, so you can use the VRM to do a three-point fix with distances.

As with anything in life, 'preparation prevents poor performance', and the tool I find almost most useful when navigating is actually my iPad fitted with the full Navionics charts. Having charts on a tablet makes life simple as I can quickly review charts for an area and update my plan, but also, by using an iPad that has a GPS fitted, the boat's position appears on the chart.
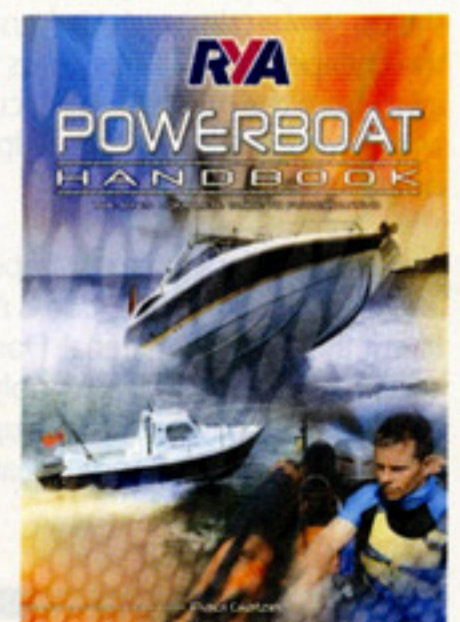

Above: Raymarine plotter & iPad

A further benefit is that when using the newer Raymarine hybrid chartplotter the waypoints and route are automatically transferred to the tablet, making it a very flexible tool. In a fully water- and shockproof case it has proved a revelation.

Hopefully, this article should provoke a bit of thought about the methods used to navigate an open-water passage. The key message, I think, is that you should definitely use waypoints/a route to navigate from A to B, but back this up with other tools to be sure where you are as you go.
Have fun and get cruising!
Paul Glatzel