Courses to Steer

with Poole Sailing

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Crossing a Tide Stream

- Crossing a relatively constant tide stream or current is best done using a visual method.
- You can look towards the destination and find a natural transit, (two fixed objects in line) and then steer the boat to keep the transit while making way towards the destination.
- Or you could take a bearing on the destination with a hand bearing compass, and again steer the boat to keep that bearing constant, a ‘Leading Bearing’.
- If the destination is not visible you could put it’s position into your GPS as a ‘Waypoint’, and then steer the boat so that the ‘Bearing to the Waypoint’ remains constant.
- Any of the above methods will produce a perfect course to steer and a straight line across the ground, but they cannot be worked out ahead of time. You must always check, on your chart, that the line of approach is a safe one.
- There are times however when we want to work out just what our course to steer will be well ahead of the event and in those instances we will need to predict the speed and direction of the current and the speed of our boat.
- We can find the probable speed and direction from a tidal atlas or from the tidal diamonds on our chart, but we will have to make an informed guess of our expected boat speed.
- Armed with that information we can work out a ‘Course to Steer’ by one of the following three methods.

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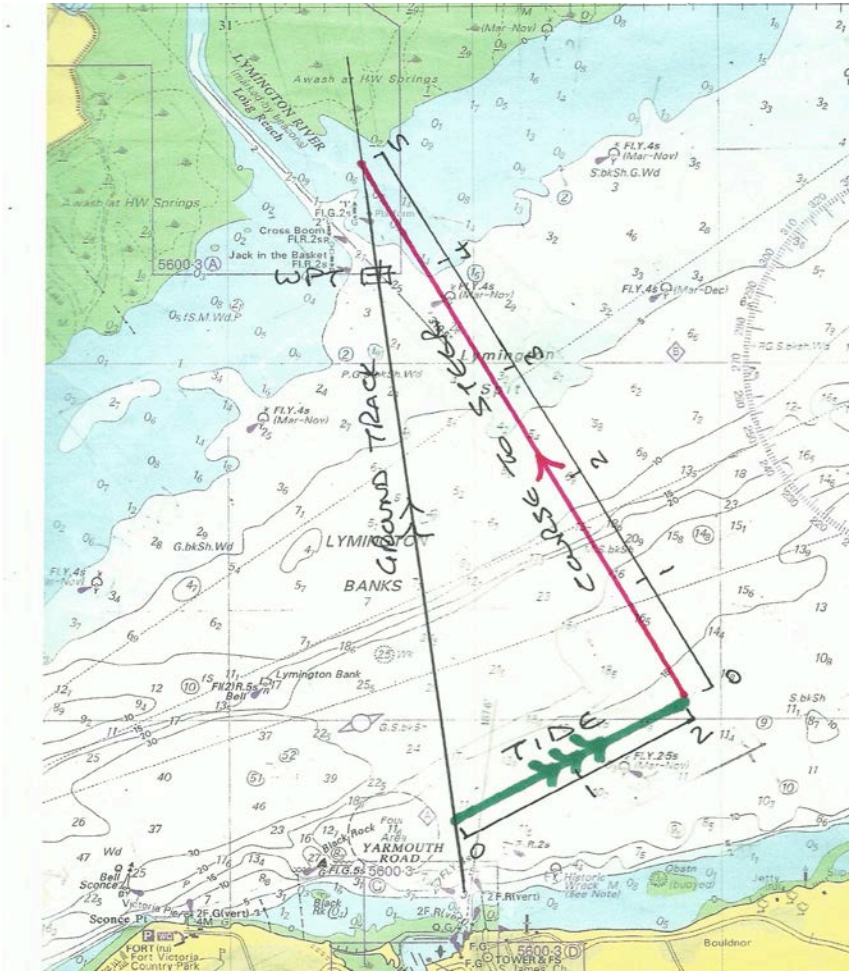
Speed Vector Triangle

- We want to work out the most effective Course to Steer across the Solent from Yarmouth to a waypoint off of the Lymington River.
- First we should draw the ground track, the line that we want to follow and extend it beyond our chosen destination.
- Next find out what the tide will be doing during your proposed journey and draw the tide vector, in our case a flood tide running at a speed of two knots. Give the tide vector a length of ‘2’. to any scale. The units on the side of your plotter are convenient.
- Finally span from the end of the tide vector to an intersection with the ground track, with a line representing your guessed boat speed (in our case 5 knots)to the same convenient scale.
- That line’s bearing is your expected ‘Course to Steer’.



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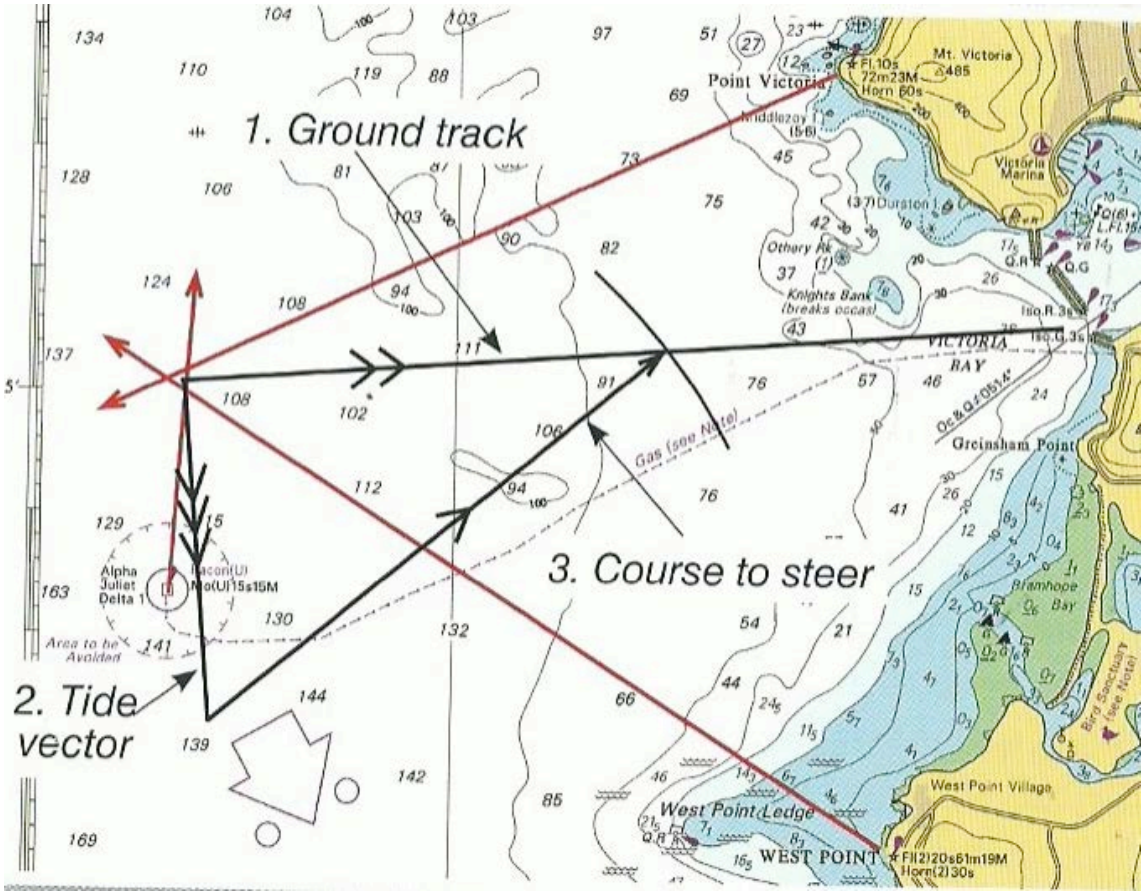
time/distance vector triangle.

- This variation on the method is in fact the ‘classic’ course to steer method, **using real distance** as the vector scale, that will be familiar to all students of the RYA shore based syllabusi.
- Our navigator has obtained a fix and then drawn the ground track to the intended destination.
- The distance to the destination is just over six nautical miles and the expected boat speed is five knots so the navigator decides to draw a vector triangle with each side having a **value of one hour**.
- Next he draws the tide vector for a one hour journey. In this case 2.7 knots at 175 degrees, so the line is 2.7 miles long.
- The last line has a length of 5 miles, the distance to be covered in one hour at the expected boat speed.
- The navigator spans a distance of five miles from the end of the tide vector to an intersection with the ground track.
- The bearing of that line is the course to steer, but further the navigator can see that he will only be half way to the destination at the end of one hour.



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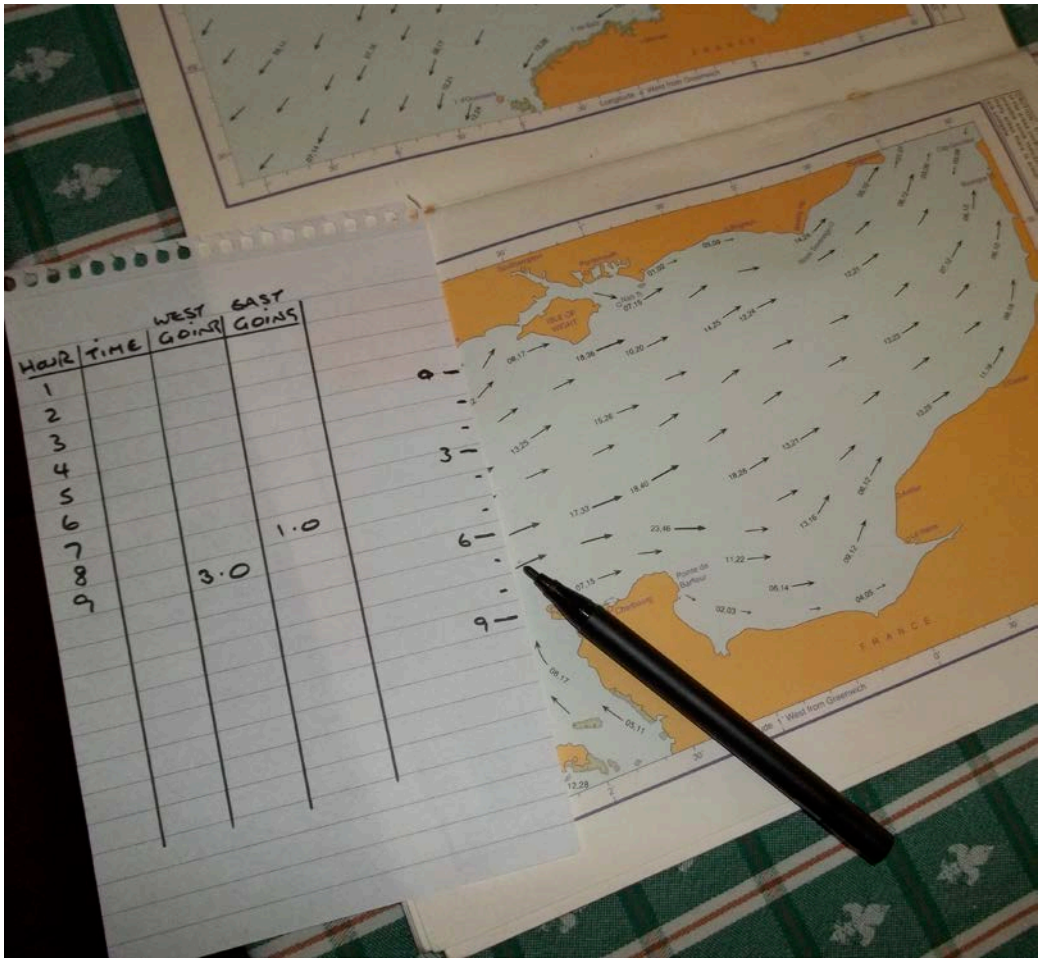
Crossing the Channel

- Longer crossings of a Tide Stream, such as the English Channel, will involve tides going in opposite directions during the journey time.
- Take a tidal atlas covering the route and decide how long the journey will take, in our case 9 hours.
- Make a scale of 9 hours the same length as the journey. Decide on the time period for the journey and then step off along the route selecting the appropriate tide vector for each hour.
- The results can be tabulated, giving the speed of the current for each hour of the crossing with separate columns for the east and west going tides.



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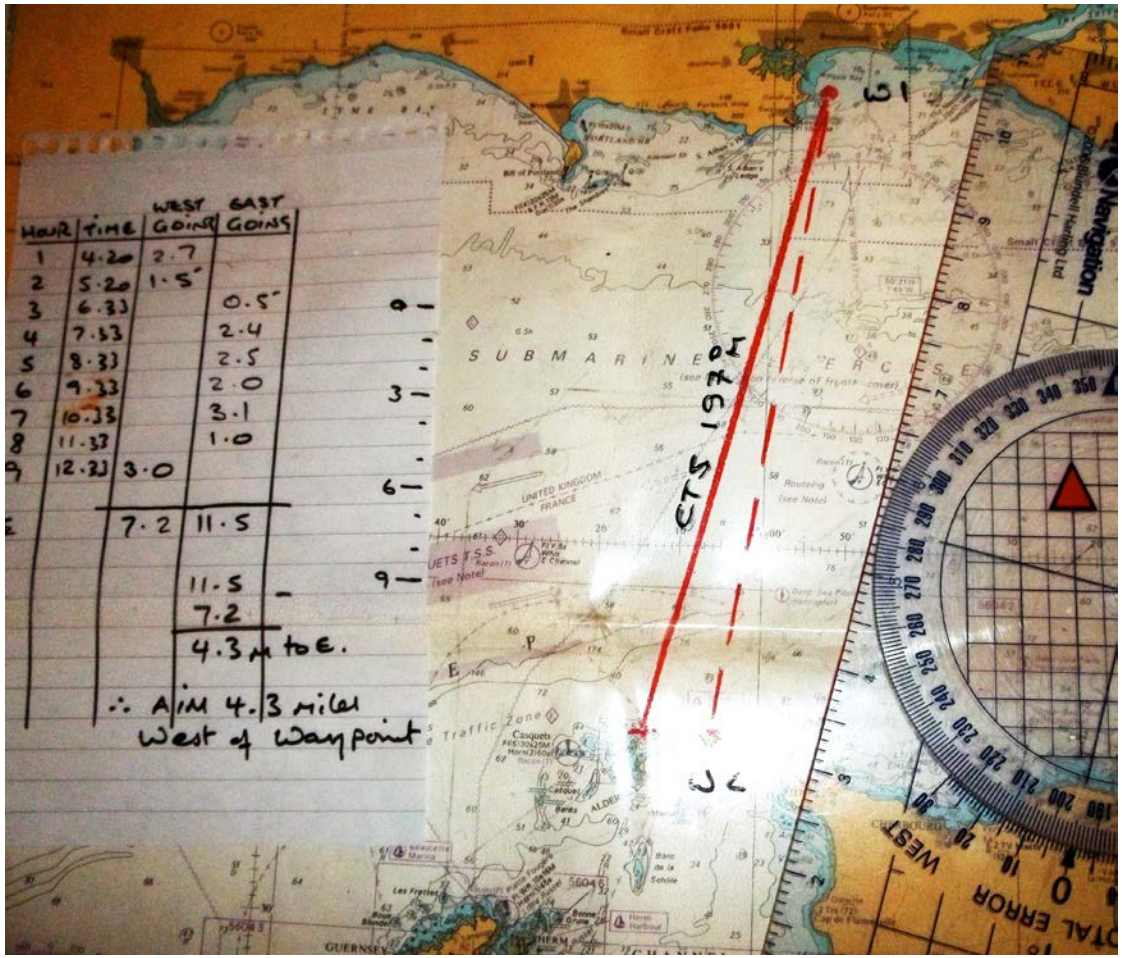
Crossing the Channel

- The columns of east going and west going tides can be individually totaled.
- There will probably be a slight imbalance of the tide speed totals, in our case showing 4.5 more east going than west going tide.
- So if we didn't make any alteration to our course and simply steered the bearing from the start point to the destination, we would end up 4.5 miles to the east of our intended destination.
- To ensure that we end up in the right place, therefore, we need to point our 'Course to Steer' at a point 4.5 miles to the west of our intended destination.



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Crossing the Channel

- Taking the efficient ‘straight line through the water’ approach we should not of course expect to follow a straight line over the ground.
- Hourly position plots will show, in our example, an initial drift up to 8 miles to the West of our rumb line, while in the latter hours of the crossing we should be about 3 miles to the east.
- We should expect our course over the ground to be distorted by the tide flow and make sure that the resulting course over the ground, is a safe one.