



Week 2



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YM 2023  
Week 2 – Charts 1



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# Charts and Publications



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## Projections

- Chart is a 2-D representation of a 3-D shape.
- The Earth is an “oblate spheroid” - we use a “model” of the earth as the basis for the chart - this is the chart’s geographic datum.
- Most charts are now based on the **WGS 84** datum.
- Conversion from 3-D to 2-D is achieved by “projection”.



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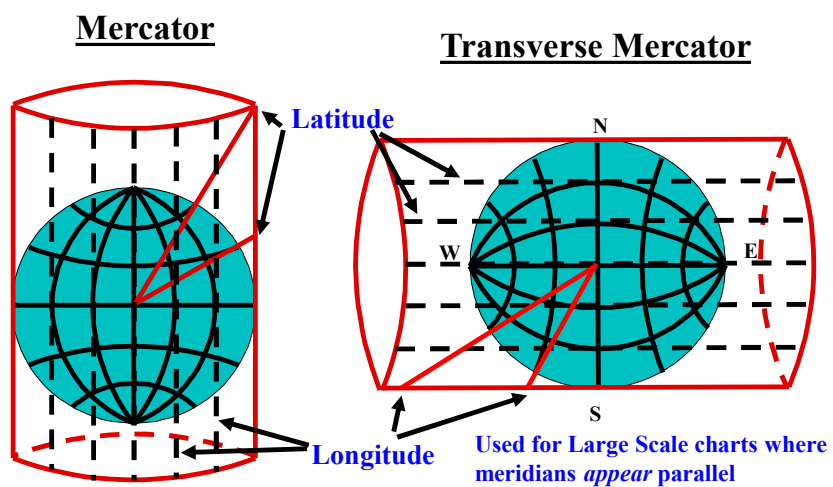
## Projections

- Two systems of projection are used for nautical charts:
  - Mercator
  - Gnomonic



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## CHART PROJECTIONS



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# Mercator Projection

## • Advantages

- Lines of Longitude and Parallels of Latitude both appear as parallel lines.
- Very good at representing direction

## • Disadvantages

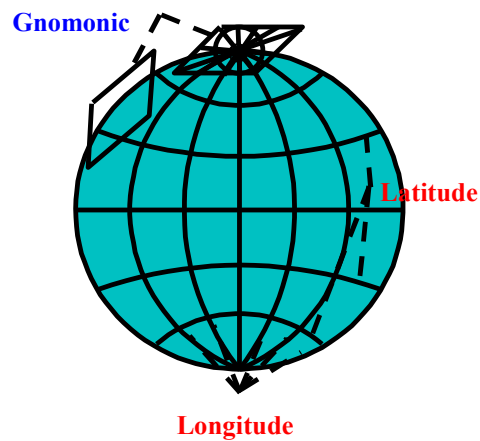
- Distances are distorted specially towards the poles.
- Straight lines are not the shortest distance between two points.



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## CHART PROJECTIONS

### Gnomonic



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# Gnomic Projection

- **Advantages**

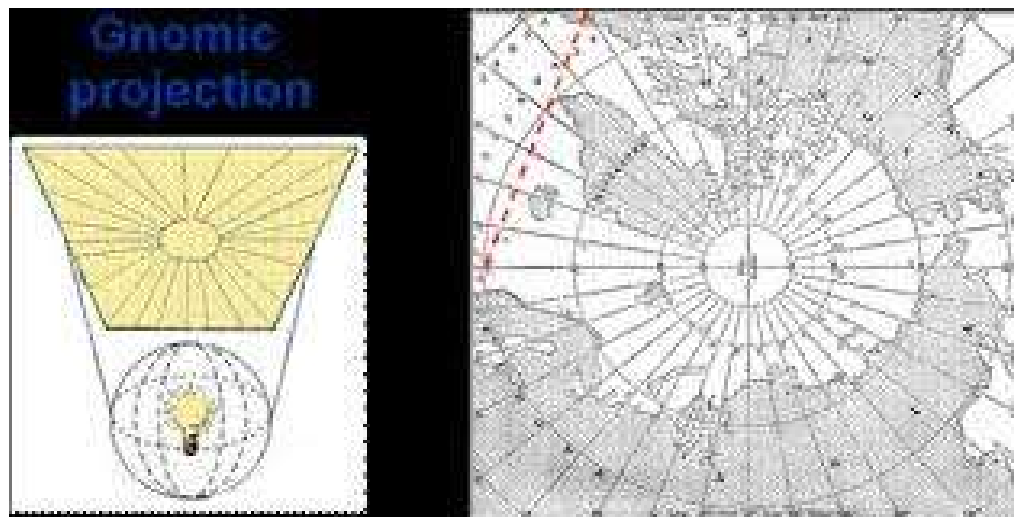
- Good in Polar areas where Mercator is very distorted.
- Shortest distance between two points is a straight line on the chart.

- **Disadvantages**

- Too much distortion of distance, direction, shape and area as you move away from the "tangent" point, hence only useful for small area or polar charts.

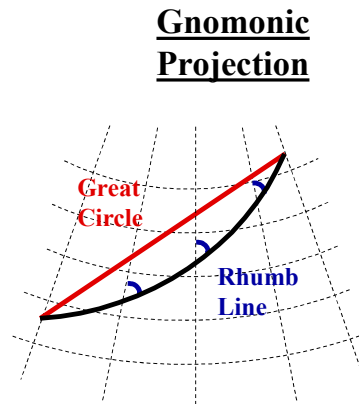
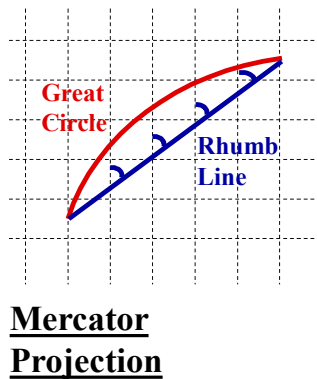


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## RHUMB LINE SAILING



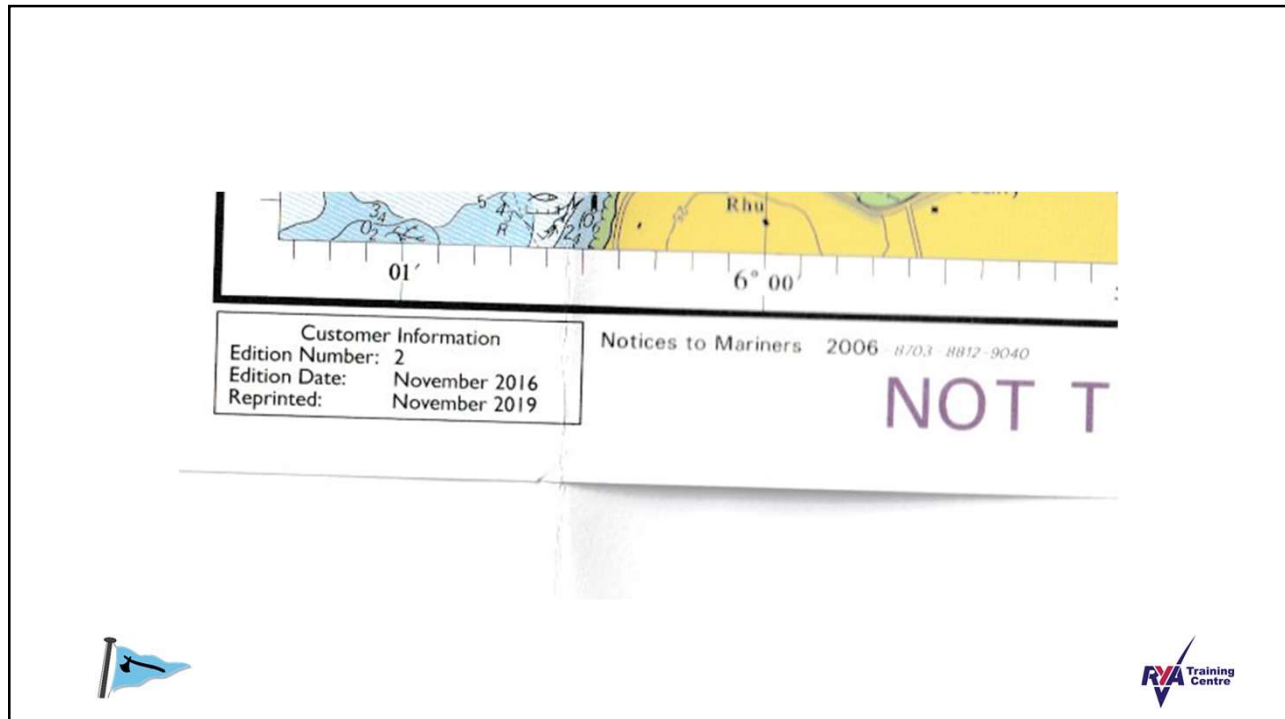
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## RYA 3 and 4

- These are “Admiralty Charts” produced by the UKHO.
- Charts are updated through “Admiralty Notices to Mariners” – now from web.
- <http://www.ukho.gov.uk/nmwebsearch/>
- “Real” charts up to date when they leave the chart agents.
- Corrections are noted in the bottom left hand corner of the chart.





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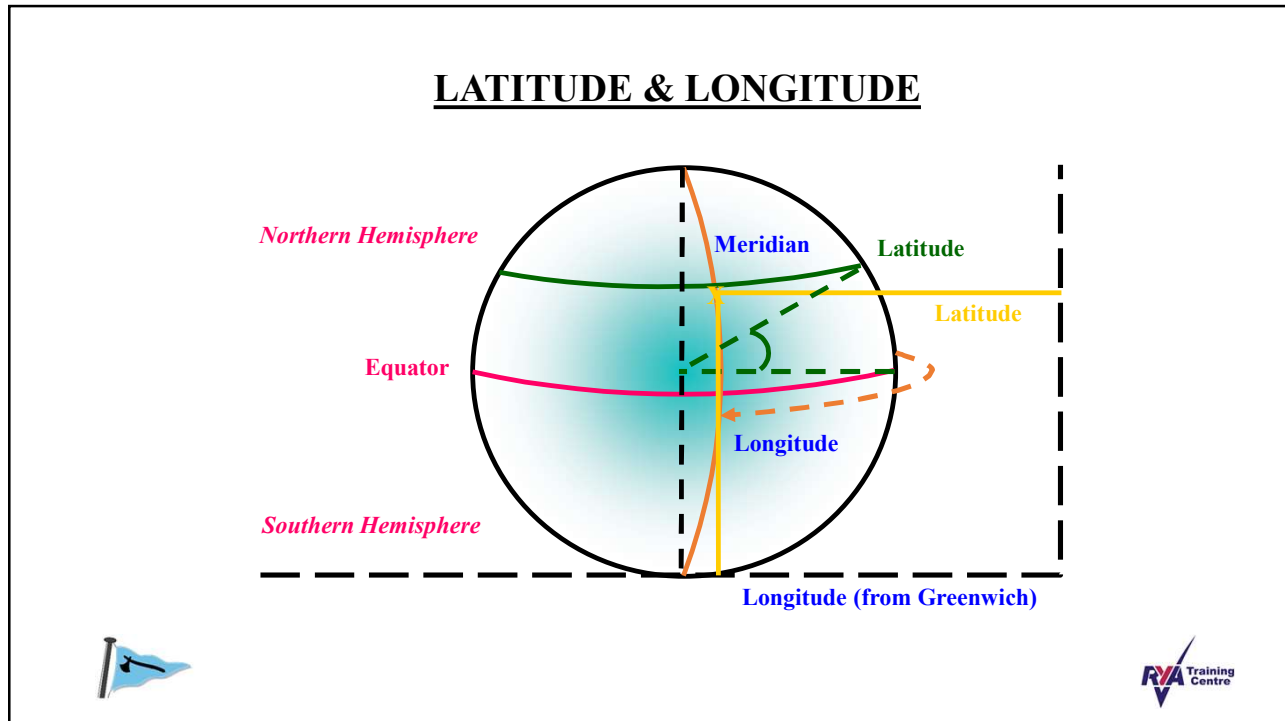
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## Positions on Charts

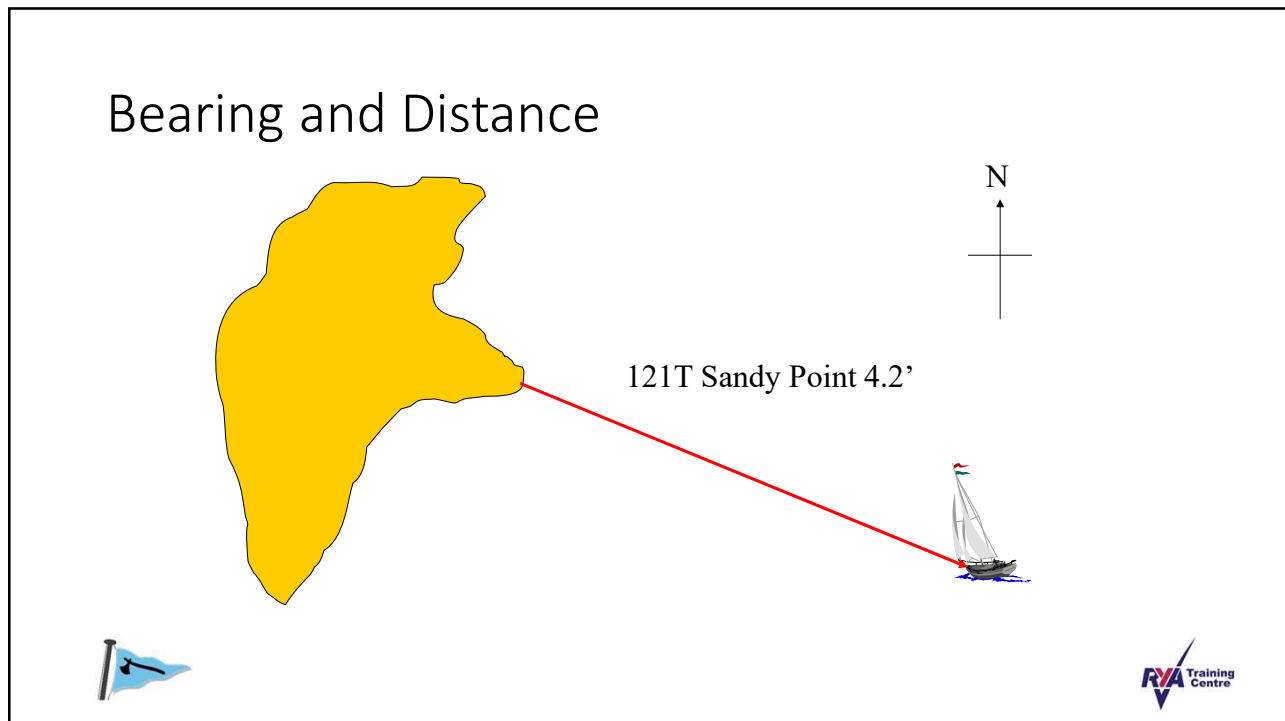
- Latitude and Longitude
- Bearing and distance from a fixed object

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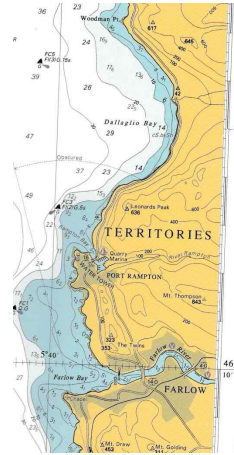
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## Mercator Projection – Measuring Distance

Distance is measured on the  
**Latitude Scale**  
 at the same latitude as the  
 distance is being measured.

One MINUTE of latitude is  
 one NAUTICAL MILE.



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## Mercator Projection – measuring distance

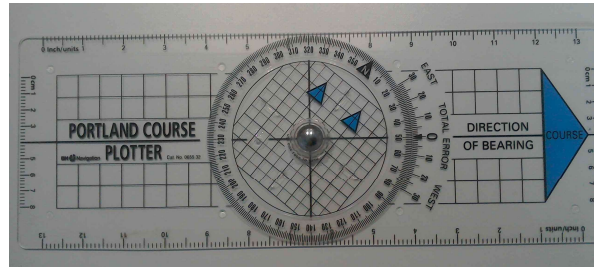


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## Measuring Direction

Bearings are measured from TRUE NORTH using the lines of Longitude on the chart.

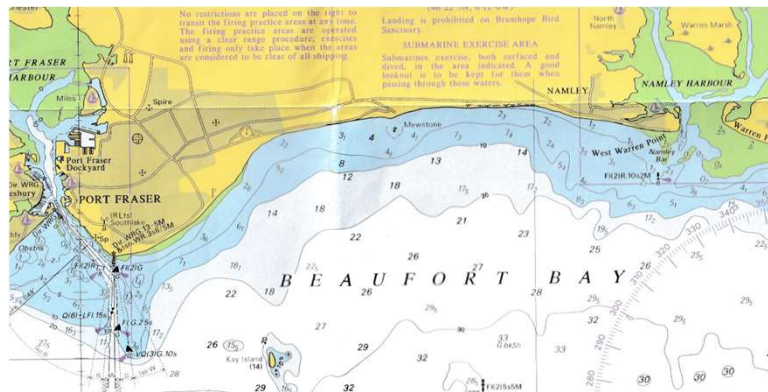
This can be done with the Portland Plotter.



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## A revision question :

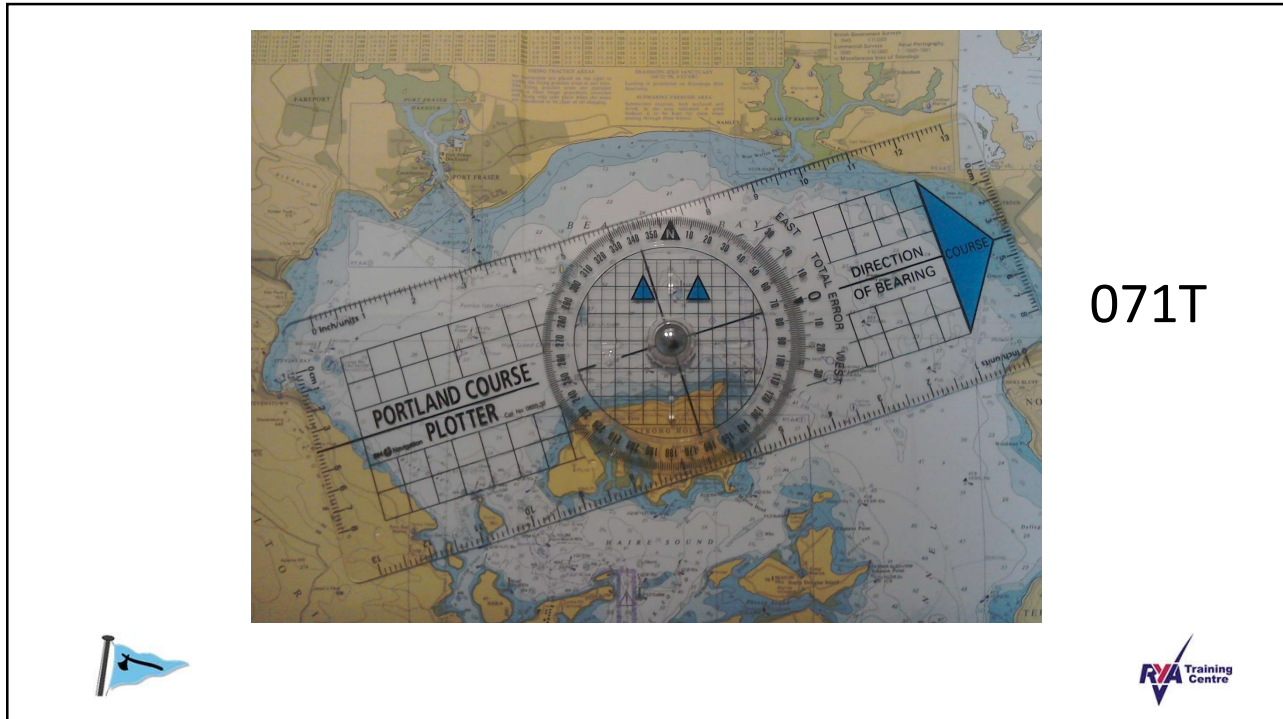
What is the True Bearing from the Green Lateral Buoy in position  $46^{\circ} 22.1'N / 005^{\circ} 58.9'W$  to the Red Beacon to the south of West Warren Point?



RYA 3

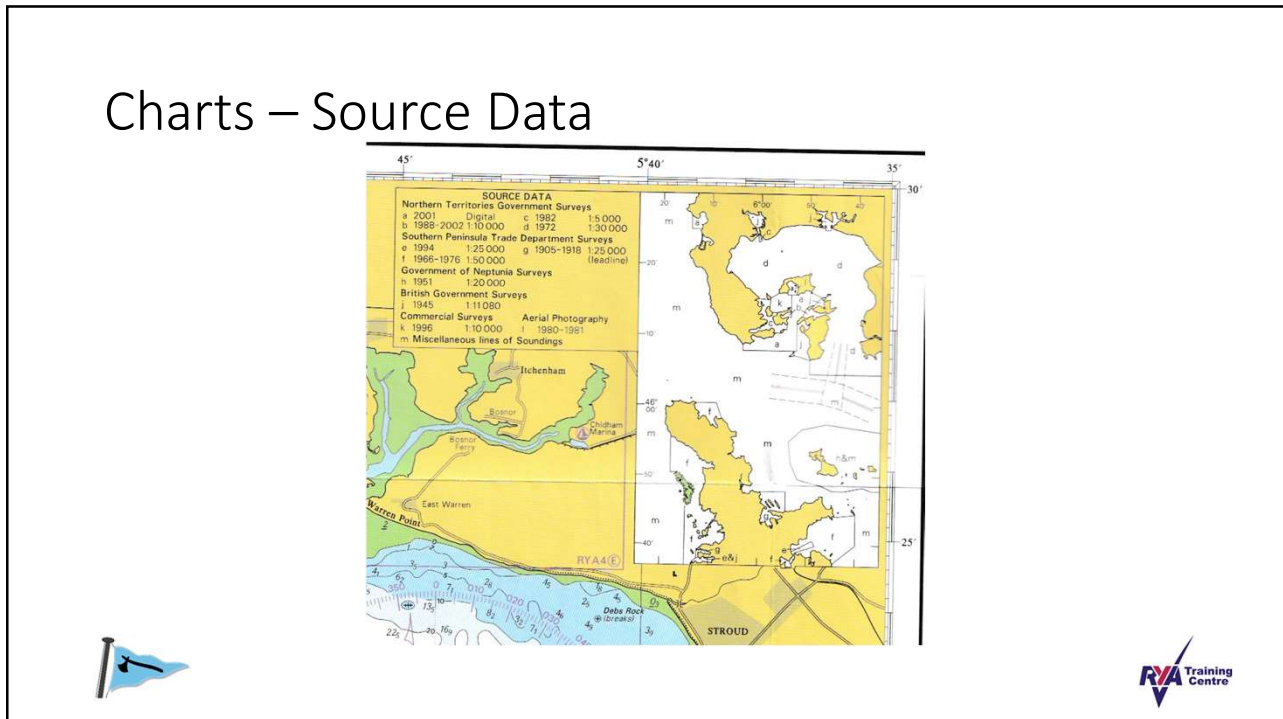


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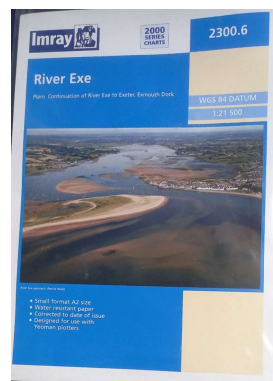
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# Coffee Time



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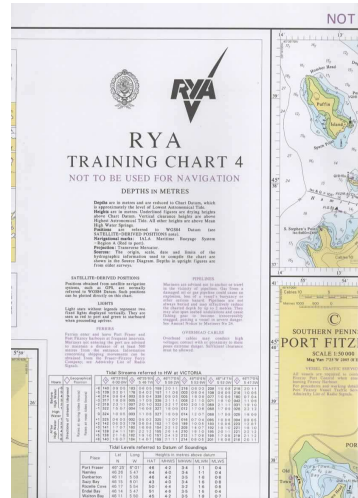
# Paper Charts



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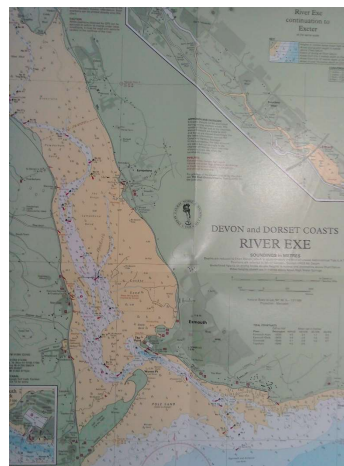
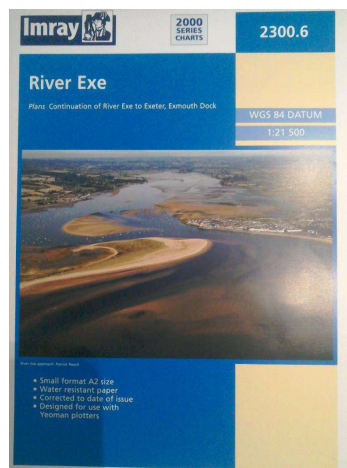
# UKHO (Admiralty) Charts

e.g. RYA3 and RYA4



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# Charts from other publishers



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## Digital Charts

- Raster
  - Scanned Paper Charts
  - Can be zoomed **but no additional information!**
- Vector
  - Data located on the chart by its position
  - More detail shown as you apply more “layers”
  - More detail shown as you “zoom” in.



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## Beware!

- A number of different leisure chart publishers:
  - Navionics / Garmin
  - Garmin Blue
  - C-map
  - Lighthouse

**BUT**

- **No common standard for the symbols or colours used.**



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# Zooming



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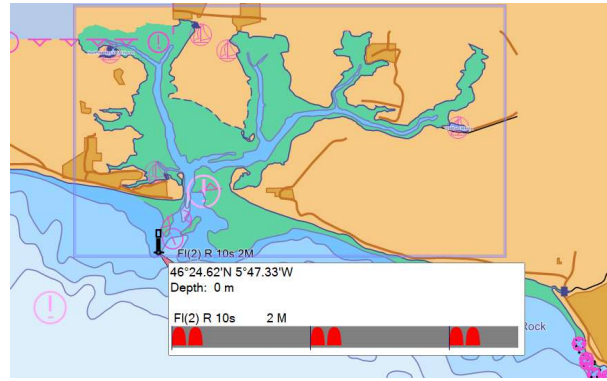
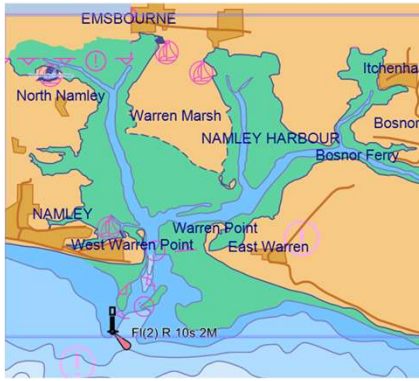


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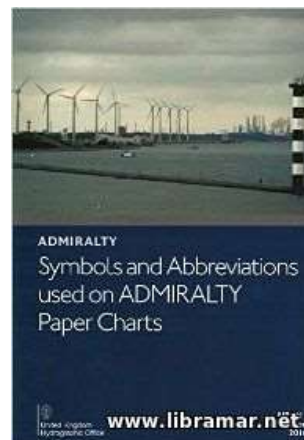
## Interrogating



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## Symbols on Admiralty Charts

These are listed  
in Chart 5011,  
which is actually  
a book.



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## Publications

- 5011
- Nautical Almanac
- Pilot Books
- Harbour Guides
  - <http://www.visitmyharbour.com/harbours/channel-west/seaton/>



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## In Class Exercise

Axe Yacht Club

RYA Yachtmaster Shorebased – Week 2

Charts and Publications

Use Chart RYA 3 and the Training Almanac

Question 1

Find the latitude and longitude of the following:

- Black Shoal Isolated Danger Mark
- Outer Fraser Safe Water Mark
- Louisa Rocks Lt
- BB5 Starboard Hand Mark
- MacArthur LANBY



Question 2

Give the position of each of the above as a bearing and distance from Holm Point Lt.



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# Homework

- Exercise: Charts and Publications
- Pages 7 and 8
- Hand in next week

