Plotting Workshop 2025

Prawle Point NCI

Photos from numerous sources; mainly the Internet

What we are covering

The weather!

Coffee & Opportunity to buy/ order your chart/plotter (£9 for the chart and £15 for the plotter- we take cards!)

Plotting workshop – Use of plotter & chart, bearing & distance, Lat &Long

Comfort break

More plotting - on the chart and OS map. Tides and introduction to allowing for tides and wind when plotting. The next session we will continue and refine your skills.

Why?

Incidents, though uncommon, require a rapid response.

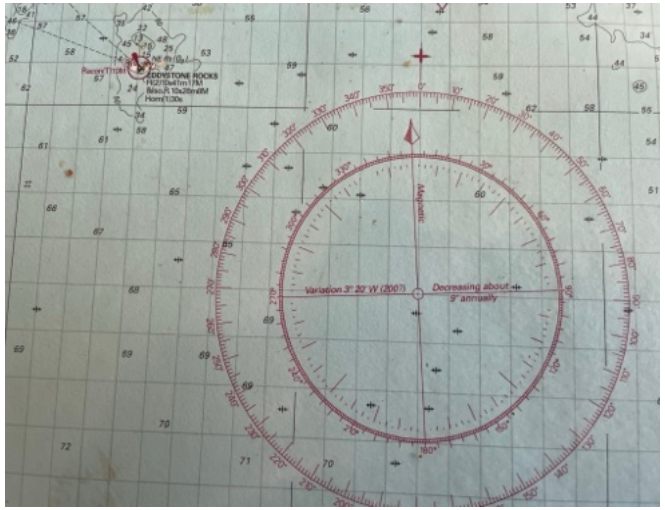
Regular practice of plotting skills prepares us for when this is needed.

This should be quick and instinctive; ideally within 2 minutes.

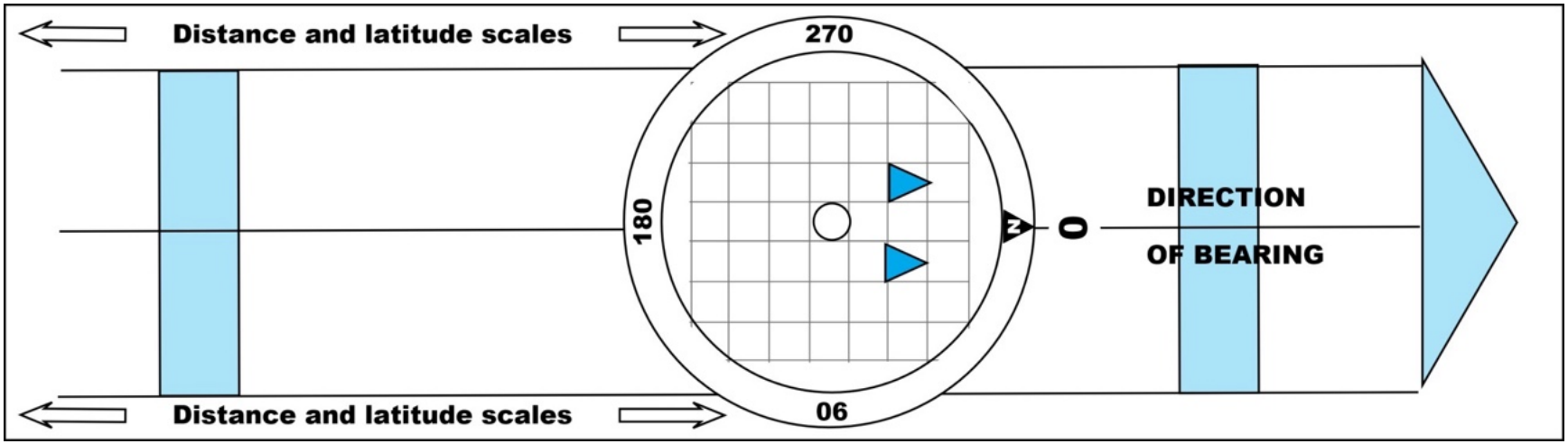
Plotting the position of a casualty is often the 1st action when an incident occurs. (Remember **Spot, Plot, Report)**

Magnetic vs True Bearing

* We generally refer to true bearings
* The Compass Binoculars give Magnetic bearings.
* The Pelorus and chart plotter gives True bearings
* The difference is currently negligible but changes each year

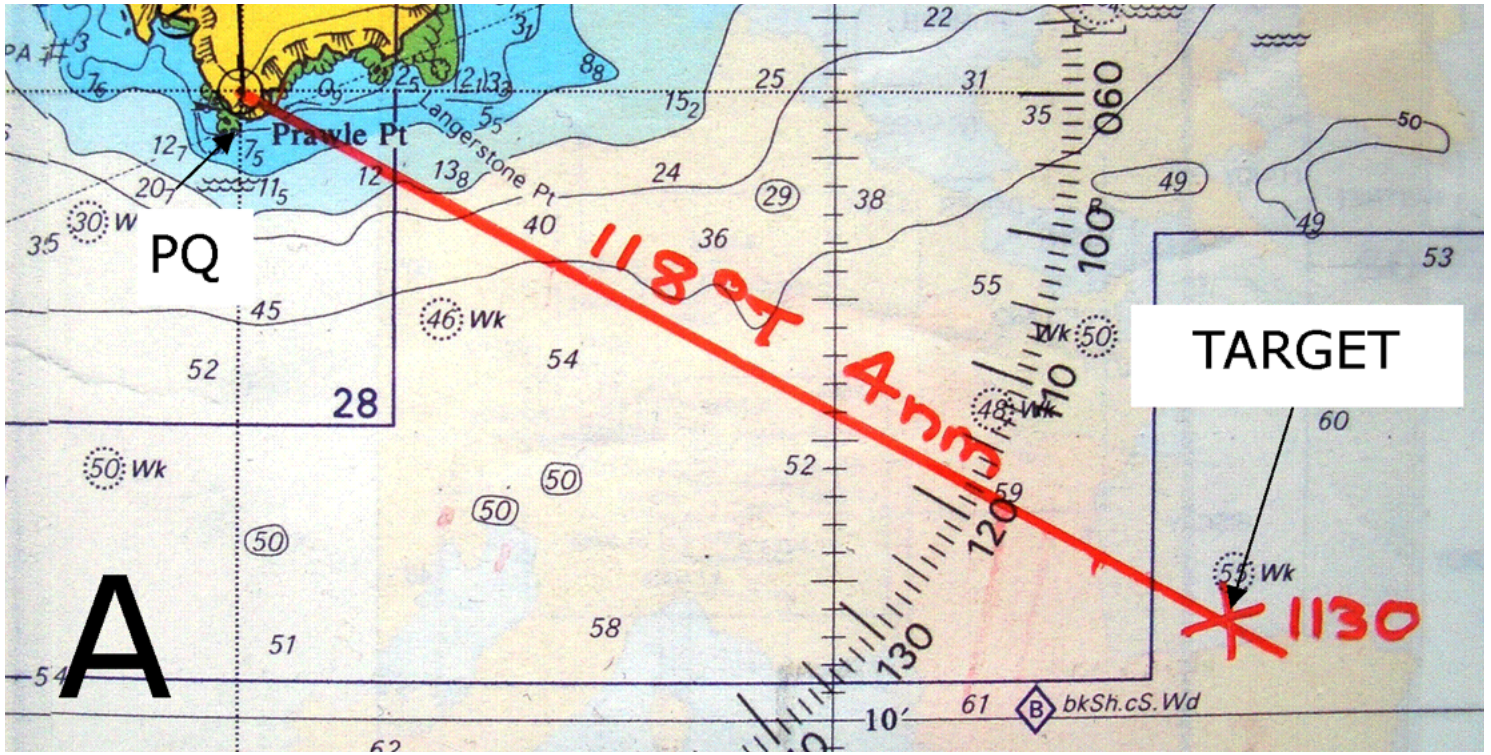


PQ-Modified Portland Plotter



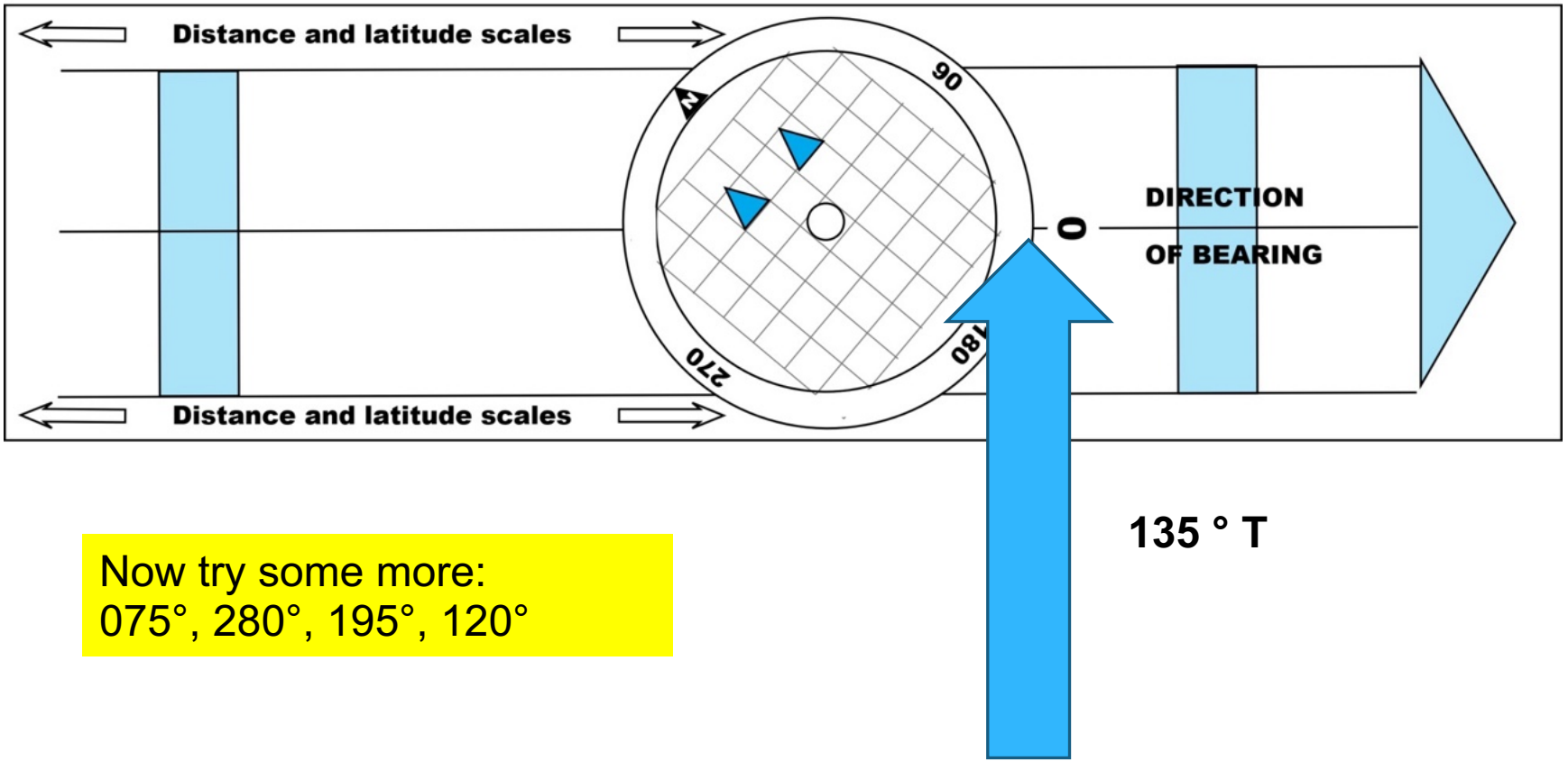
Plotting a Target

If at PQ, use the compass printed on the chart & measure distance using the Nautical Miles scale on the plotter
Mark the position & annotate with bearing, distance & time



To Set a Bearing: eg 135°T…

…rotate the compass rose so that 135° lines up with the direction of bearing arrow.

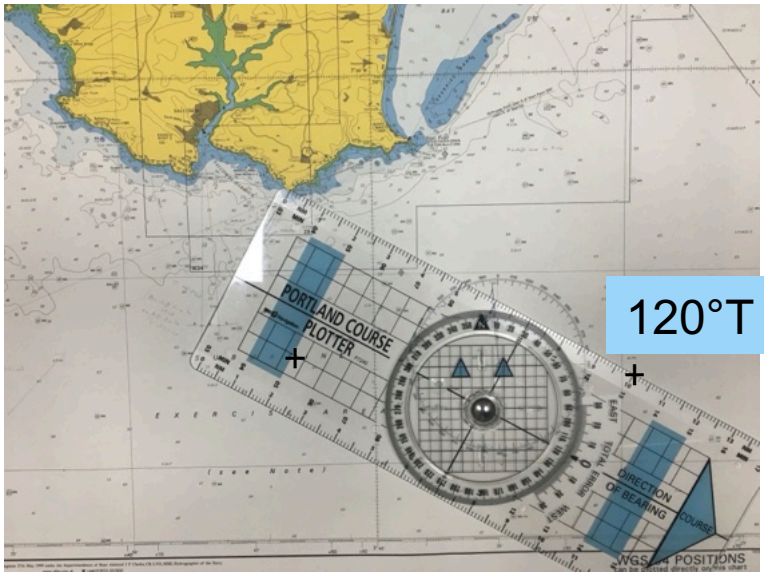


Now try some more:
075°, 280°, 195°, 120°

Plotting a Target using the Plotter: eg 120° 10.1 NM

1) Rotate compass to bearing of target.
2) Position plotter on chart with small blue arrows pointing north, grid aligned with gridlines on chart & 0 NM on scale over PQ.
3) Remember the large blue arrow points towards the target.
4) Draw line, mark position & annotate with time, bearing & distance from PQ

Hint: If there is no convenient gridline with 0 NM at PQ, move the plotter along the bearing until you do find one & draw a line, then measure off the required distance.



120°T 10.1 NM

Exercise 1

Plot the following targets on the chart:

1: 176°T at a range of 5.6nm from PQ

2: 136°T at a range of 3.4nm from PQ

3: 115°T at a range of 3.9nm from PQ

4: 182°T at a range of 2.5nm from PQ

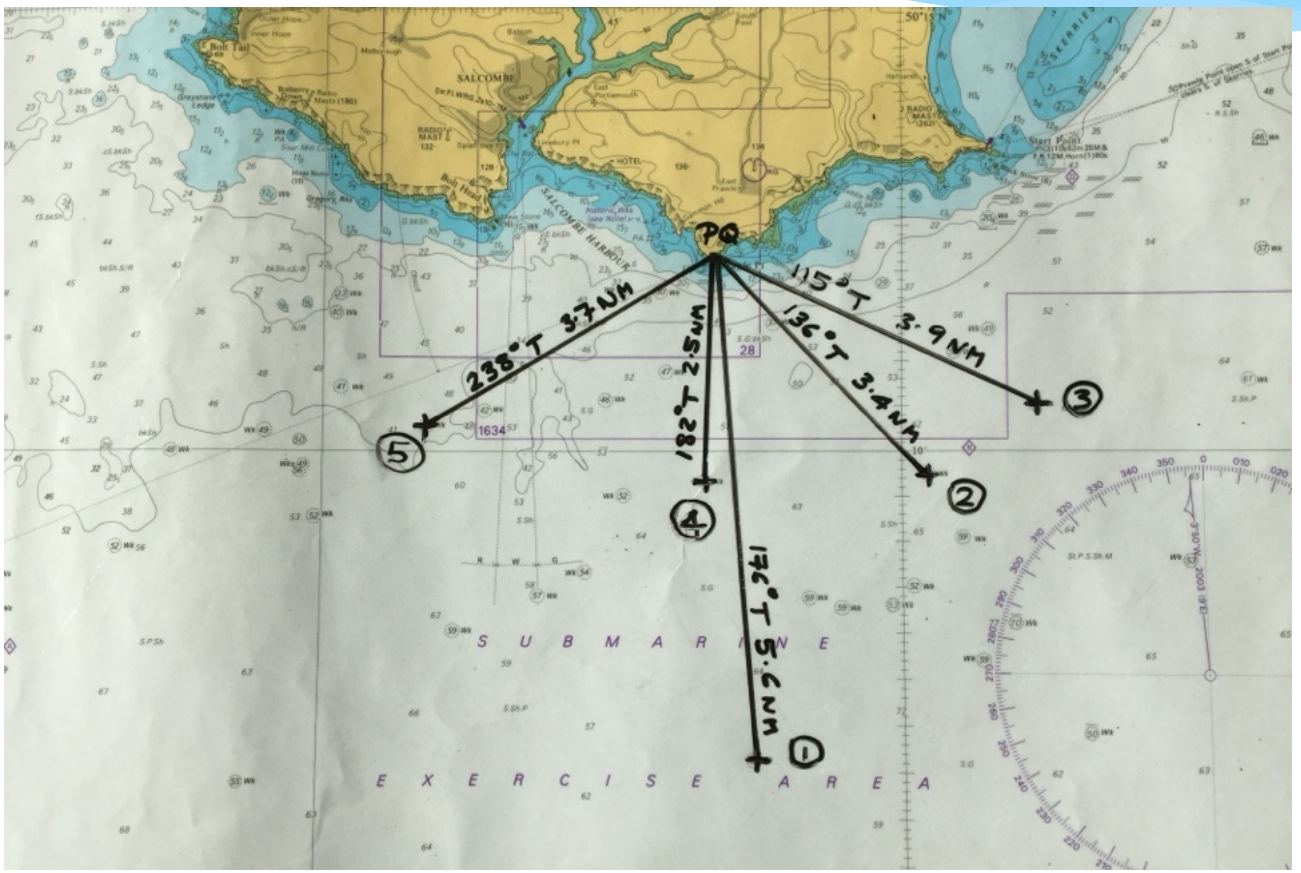
5: 238°T at a range of 3.7nm from PQ

Find the depth of water at each wreck & total of all 5

How long did you take?

Exercise 1: Answers

NB: Sum of depths = 259m



More practice?

* 297° T / 1.1NM
* 216° T / 2.0 NM
* 113° T / 2.8 NM

More practice? (Answers)

* 297° T / 1.1NM Historic wreck
* 216° T / 2.0 NM (46m) Sunk in WW1
* 113° T / 2.8 NM (50m) Sunk in WW1

Practical Application

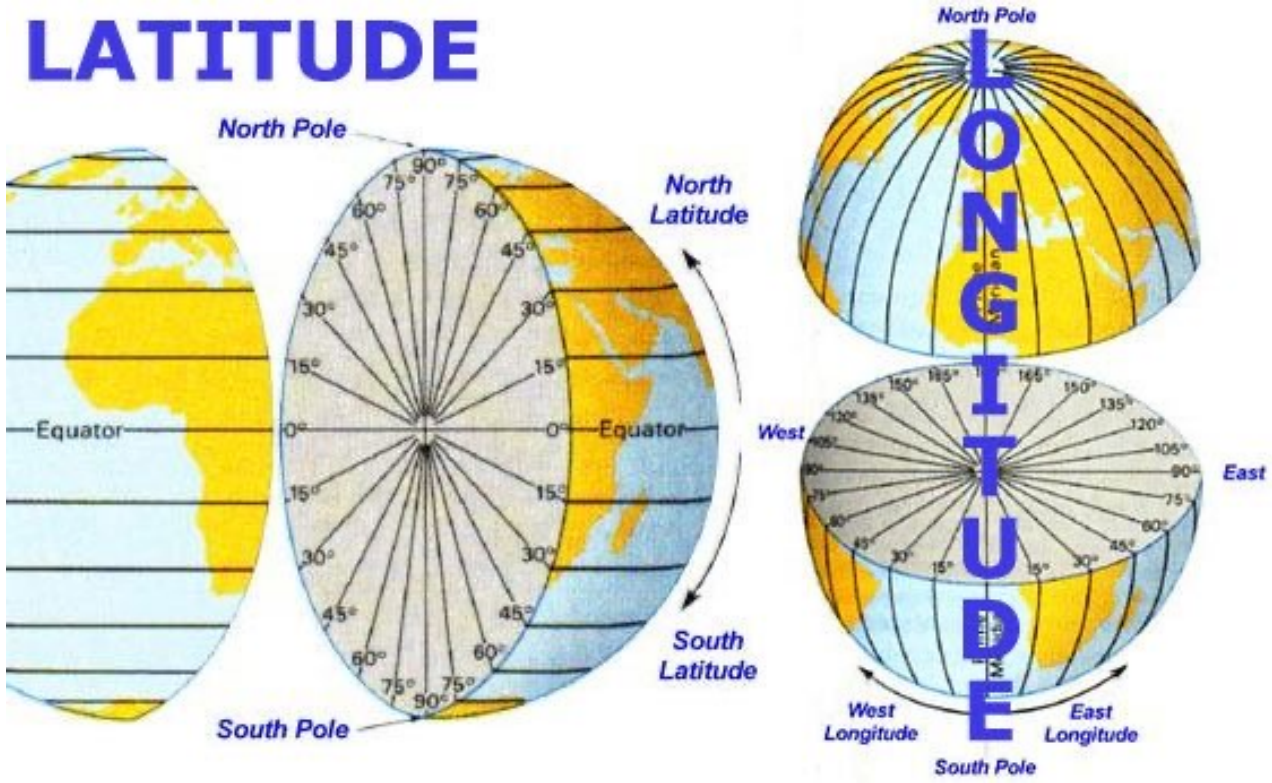
* To check a vessel is where it is reported to be

by a member of the public, the coastguard or the vessel itself.

* Vessels have confused Start Point with Prawle Point or Bolt Head in the past.
* A qualified watchkeeper is expected to do this in under 2 minutes.

* Note: A bearing is generally given **from** land **to** sea

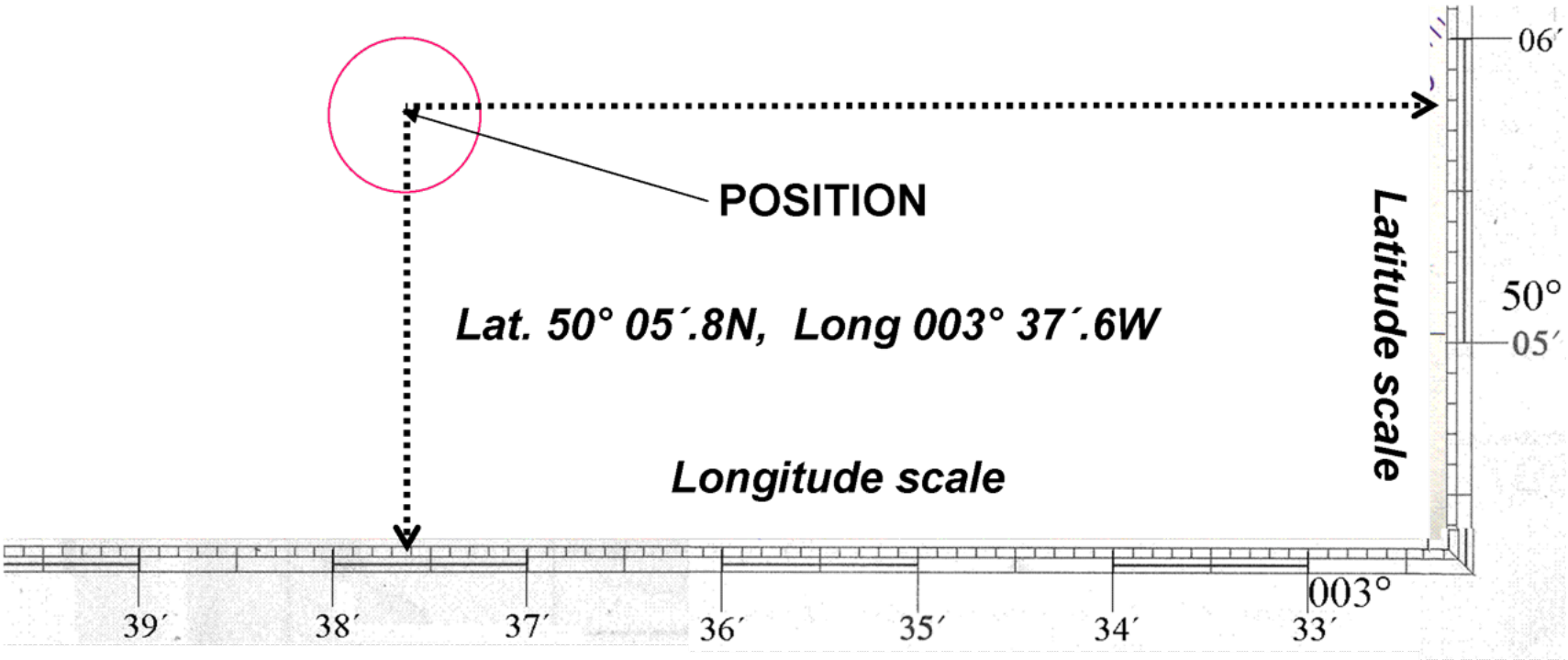
Latitude & Longitude (Global)



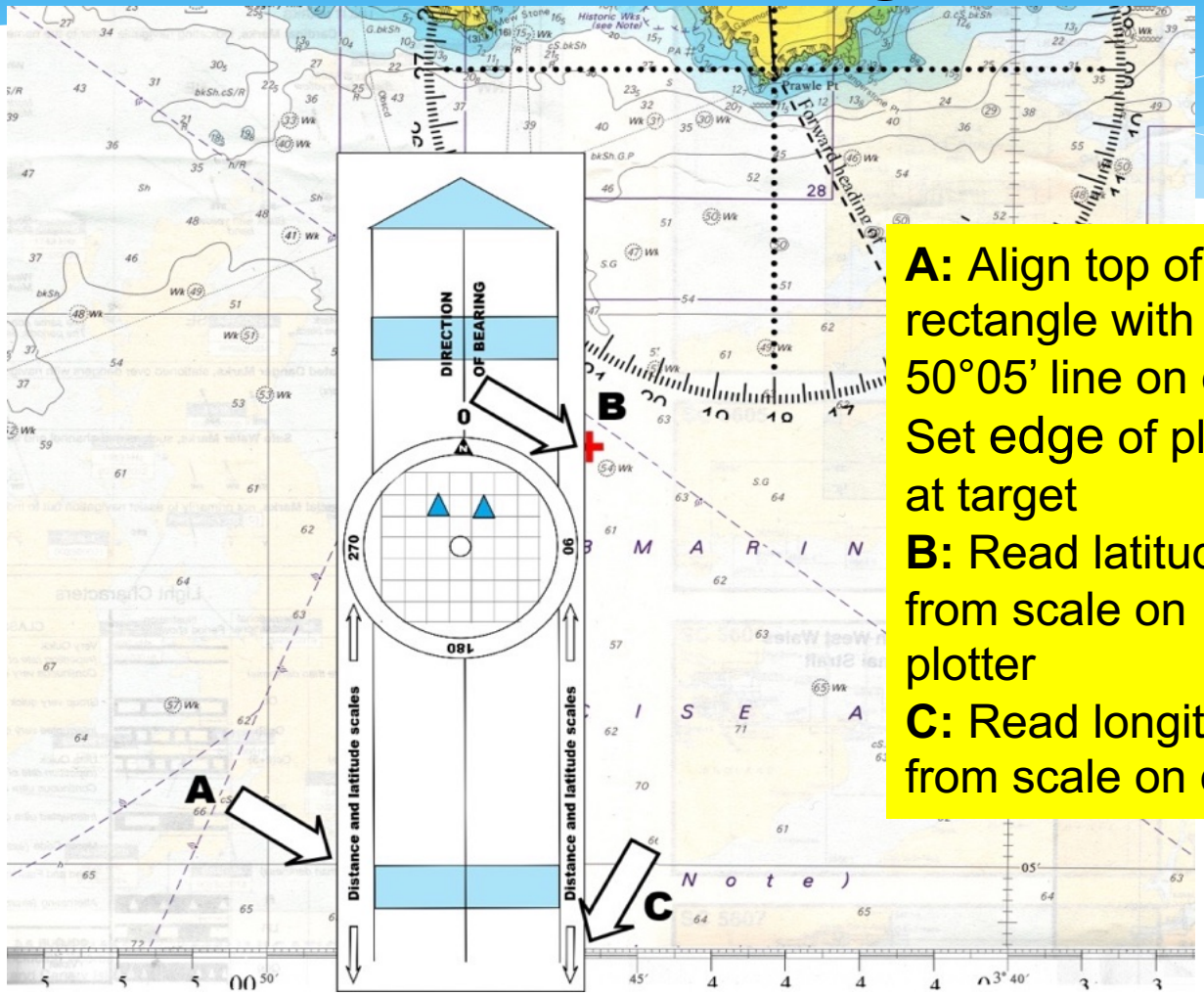
Latitude scale is used for measuring distance:
1°of latitude is a constant length; 1°of longitude will vary with distance from the equator.

A **nautical mile** is 1 minute of latitude so 1/60 of a degree of latitude.

Latitude and Longitude (Local)



Find Latitude and Longitude of plotted target



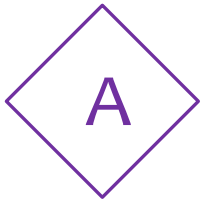
A: Align top of blue rectangle with 50°05’ line on chart. Set edge of plotter at target

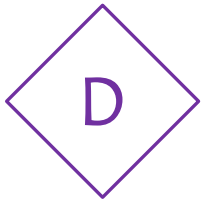
B: Read latitude from scale on plotter

C: Read longitude from scale on chart

Exercise 2

Determine the Latitude and Longitude of tidal diamonds A and D on the chart





Answers Exercise 1

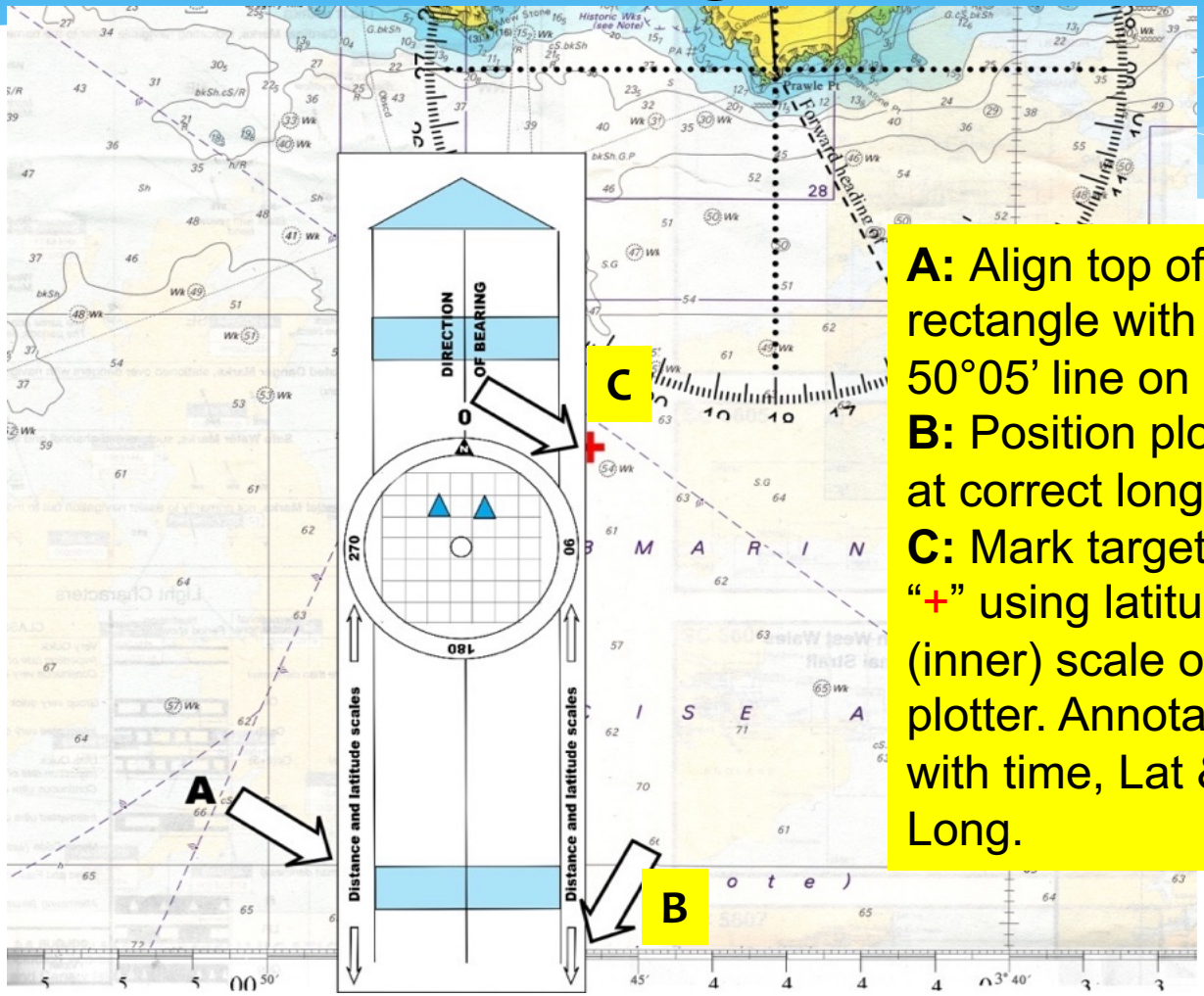
- A 50° 07’.8 N 003° 55’.3 W
- D 50° 13’.0 N 003° 37’.0 W

Practical Application:

* e.g. To give a Lat / Long position of a vessel we have plotted to the coastguard.

* A qualified watchkeeper should aim to do this in under 2 minutes.

Plot Latitude and Longitude of target



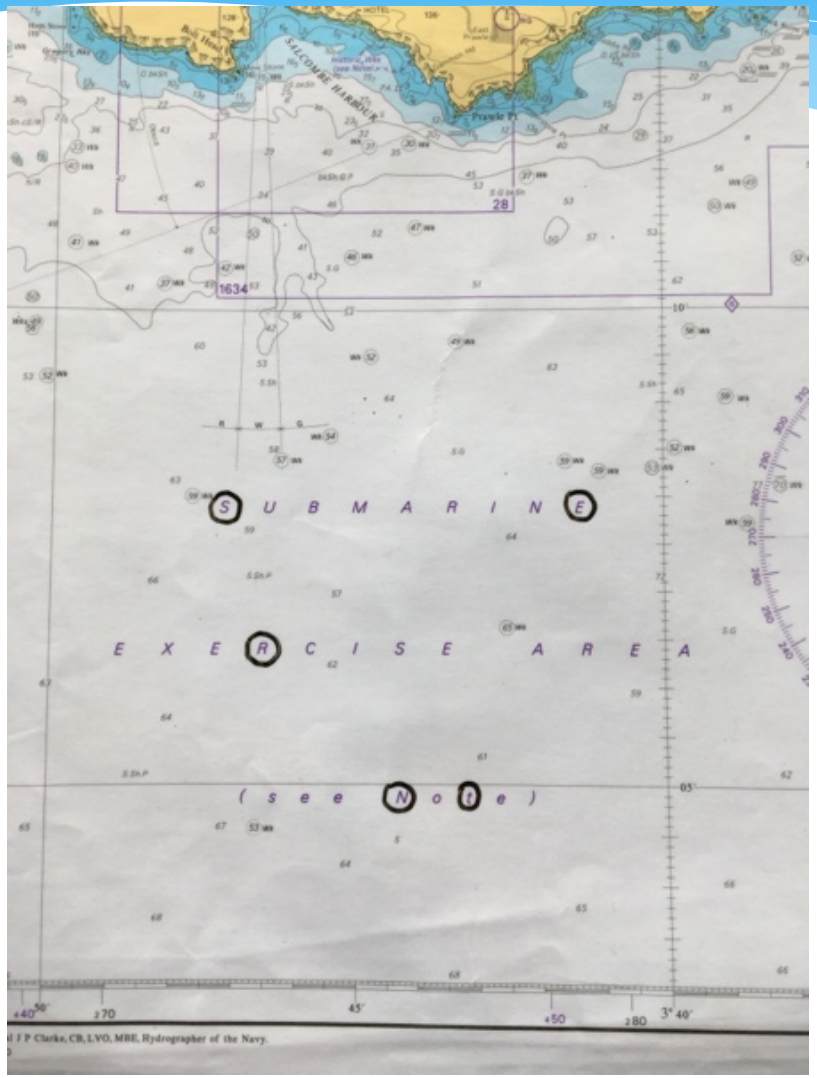
A: Align top of blue rectangle with 50°05’ line on chart.
B: Position plotter at correct longitude
C: Mark target with “+” using latitude (inner) scale on plotter. Annotate with time, Lat & Long.

Exercise 3

Plot the following. Find the letter at each position on the chart, which spells a word:

- 1) 50° 07’.9 N 003° 47’.2 W
- 2) 50° 04’.8 N 003° 43’.2 W
- 3) 50° 07’.9 N 003° 41’.3 W
- 4) 50° 06’.4 N 003° 46’.6 W
- 5) 50° 04’.9 N 003° 44’.3 W

Exercise 3 - Answers



NB: The hidden word is “STERN”

Practical Application

* To plot the position of a vessel in distress from a Mayday call heard on VHF

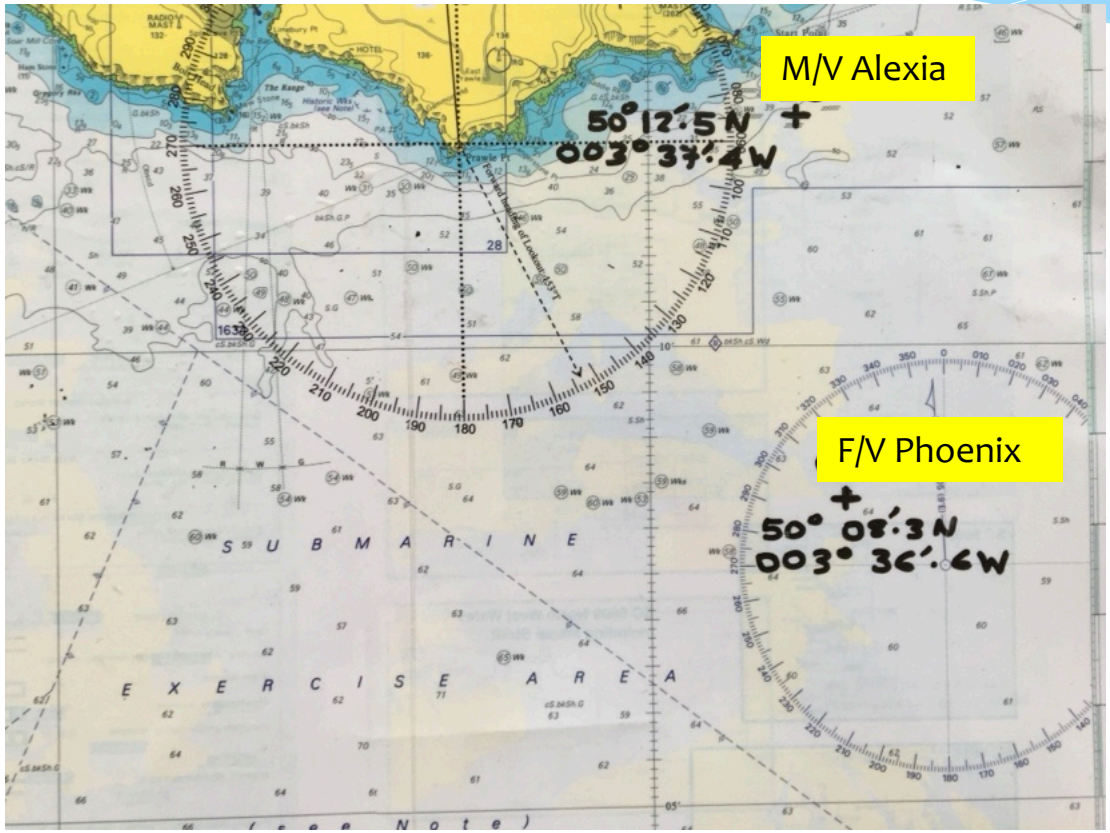
* Again, a qualified watchkeeper is expected to do this in under 2 minutes.

Exercise 3

Plot the following and record the range and bearing from PQ:

- ?👂
- ?👂

Exercise 4 - Answers



Convert Lat/Long positions M/V Alexia & F/V Phoenix to Bearing & Distance from PQ

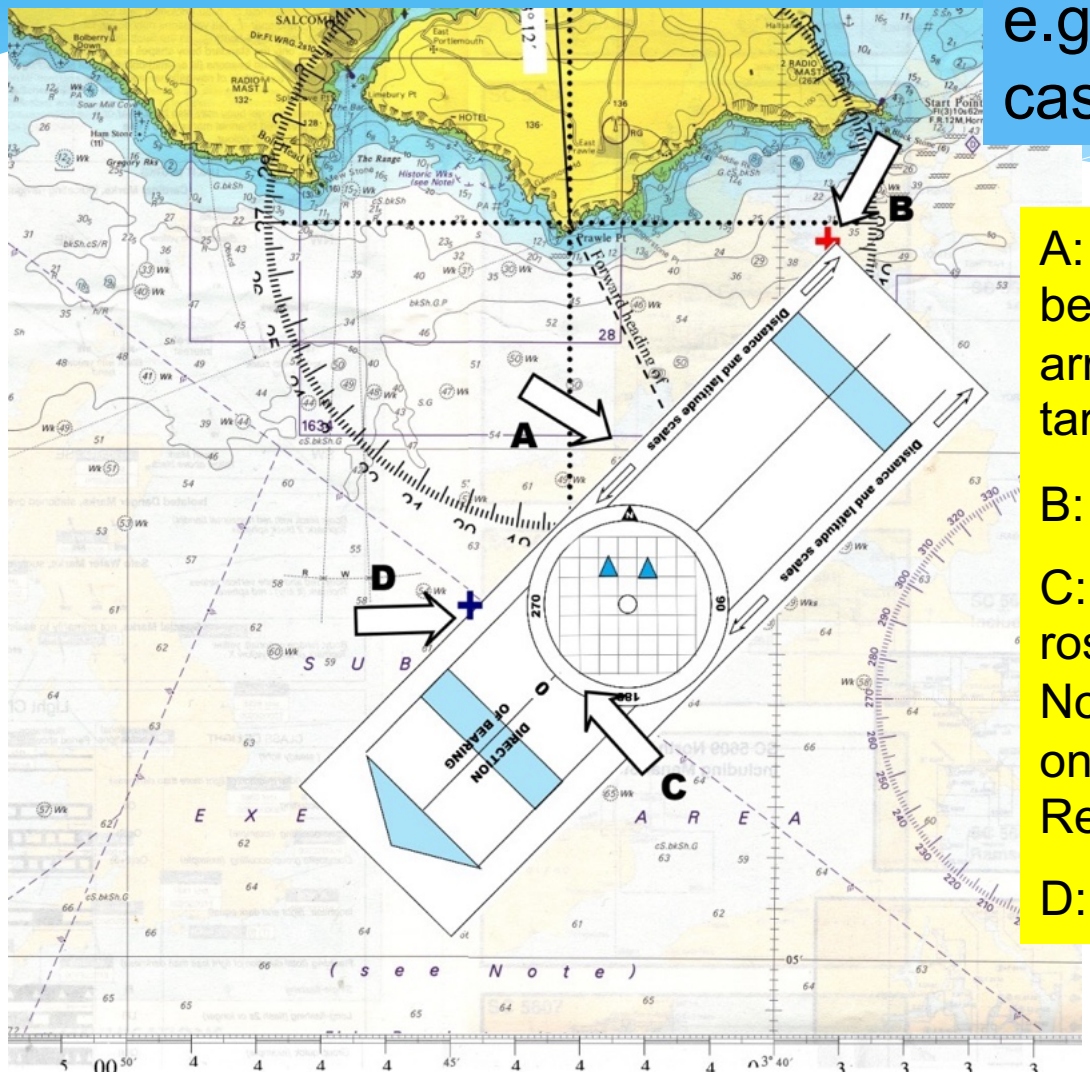
Exercise 4 – (Answers Continued)

- F/V Phoenix: 133°T 5.8 NM
- M/V Alexia: 087°T 3.8 NM

Note: do not round up or down the range or bearing

Bearing and distance *from* one vessel (+) *to* another (+)

e.g. from lifeboat to casualty = Application



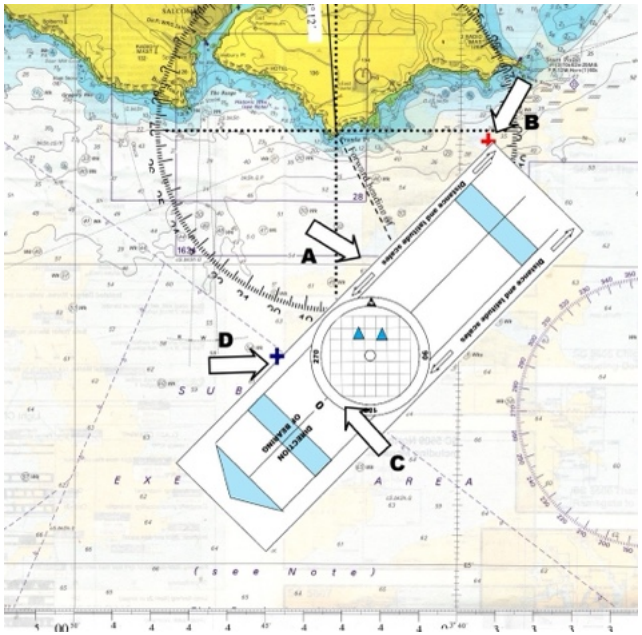
A: Align plotter between vessels with arrow pointing to target (+) and

B: + at 0 nm

C: Rotate compass rose until ▲▲ points North (align with grid on chart).
Read bearing at ↓

D: Read distance at +

To Calculate a Reciprocal Bearing



To determine the bearing *from* + *to* + :

If the bearing from + to + is less than 180°, add 180 to bearing.
i.e. 020° becomes 200°
& East 090° becomes West 270°

If the bearing from + to + is more than (or equal to) 180°, subtract 180 from bearing.
i.e. 250° becomes 070°
& South 180° becomes North 0°

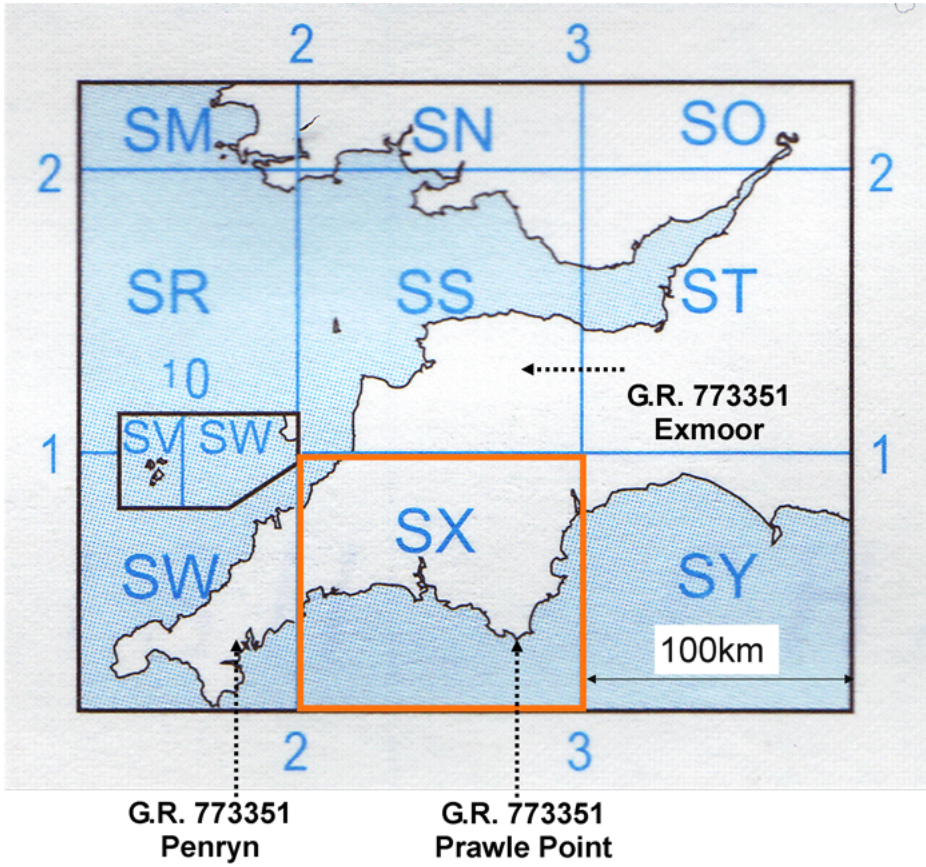
Or draw line through compass rose and read bearing from opposite side

Exercise 5

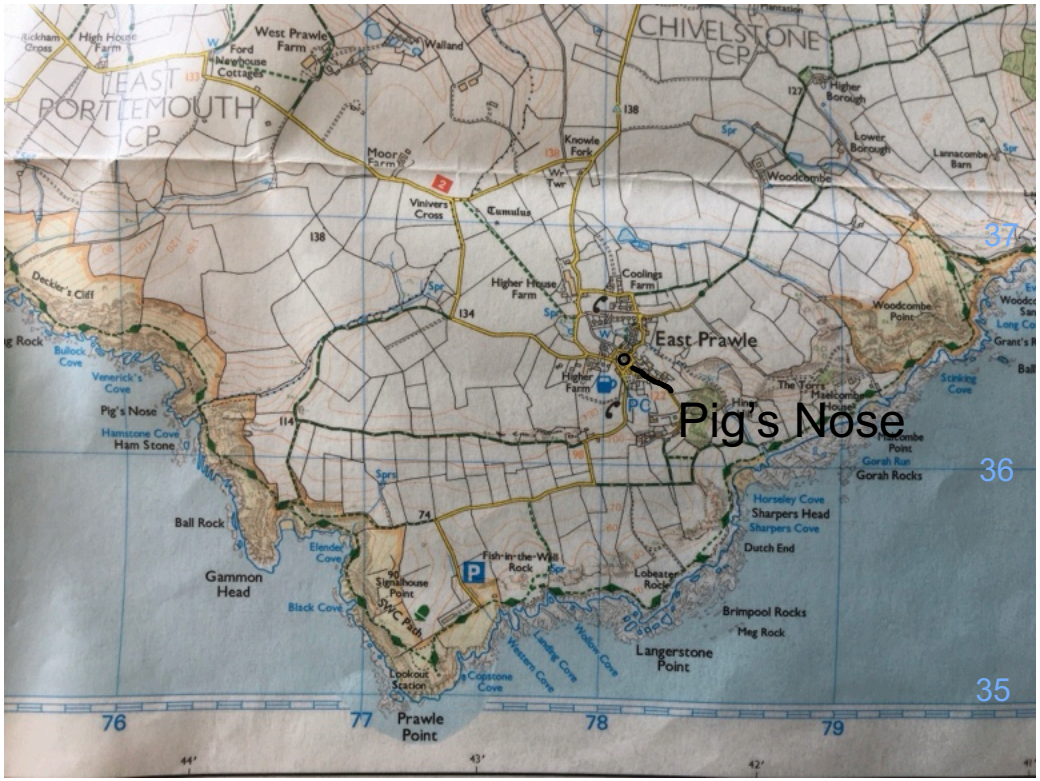
- Take turns to mark two random sea positions on your chart and work out the distance and bearing between them and write it on the chart
- Calculate the reciprocal bearing in each case.

On Land: OS Maps

Grid References have SX (Sierra X-ray) prefix in this area



To find a grid reference:



e.g. Pig's Nose

Read co-ordinates of target from scale at edges of map using a ruler for accuracy

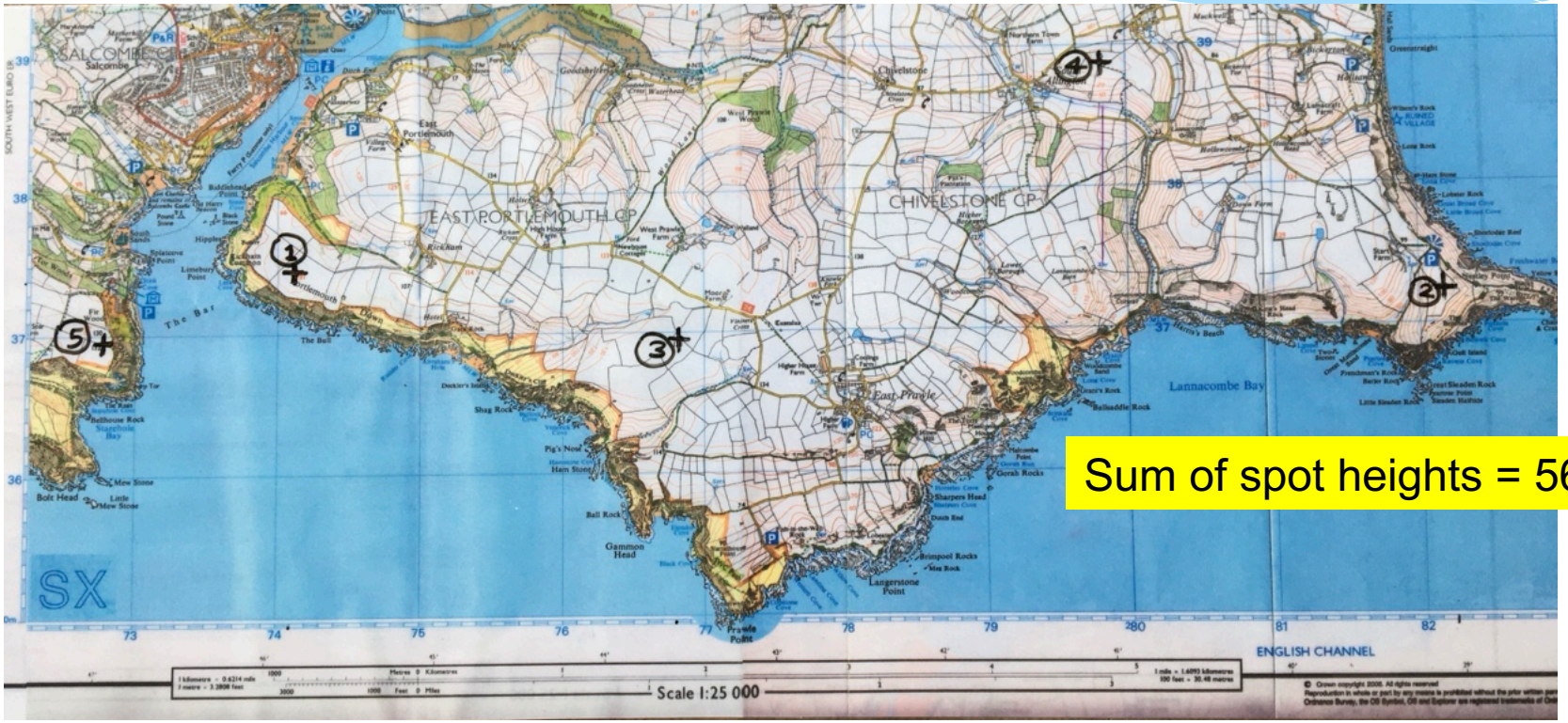
Go along the corridor then up the stairs i.e. Easting then Northing

SX 781 364

Exercise 6

* Plot the following grid references, note the spot height at each position & add them together.
* 1) SX 741374
* 2) SX 822373
* 3) SX 768369
* 4) SX 798388
* 5) SX 728369

Exercise 6: Answers



Practice!

You will have lots of practice at plotting as you go through your training; you will get quicker at it & eventually, it will become instinctive!

More advanced plotting (if we have time)

- Tide and wind
- Predicting the future position of a casualty at sea allowing for wind & tide.
- Calculating when lifeboat will arrive on scene.

Tides :PQ Rule of Thumb

At Prawle:

* HIGH WATER SPRINGS are generally between 0600 - 0830 hours and 1830 -2100 hours GMT.

* HIGH WATER NEAPS (daytime) are generally between 1200 - 1500 hours GMT.

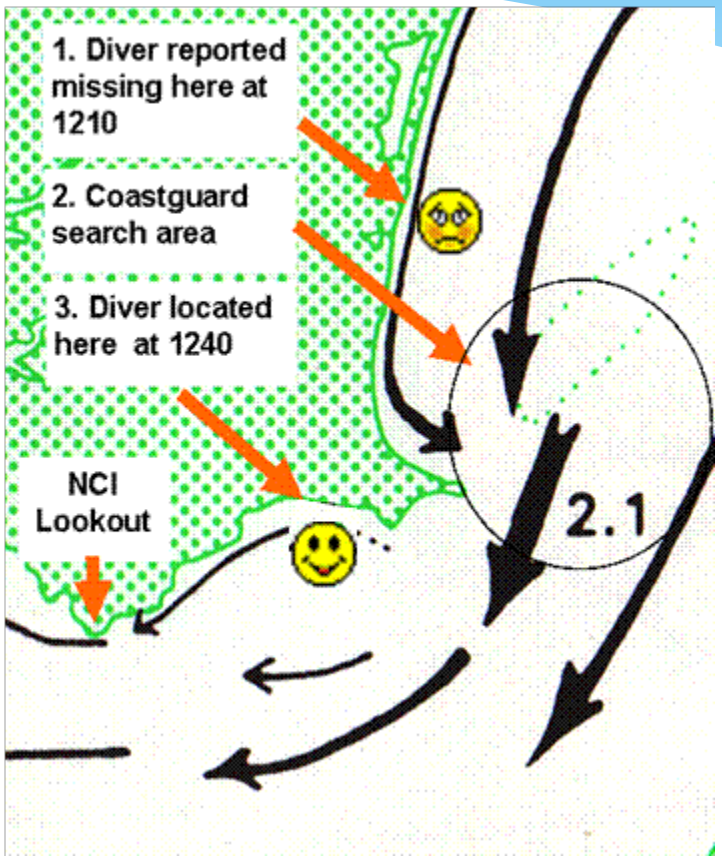
Tidal Streams-terminology

* **Set** -The direction in which a tidal stream flows:
* A tidal stream flows TO…unlike wind which blows FROM…
* A West setting (flowing) tide and a Westerly wind, you will hear the phrase ‘Wind against tide’.
* **Rate** -The speed in knots at which a tidal stream flows.
* **Drift** -The distance the stream carries in a period of time.

Wind against tide

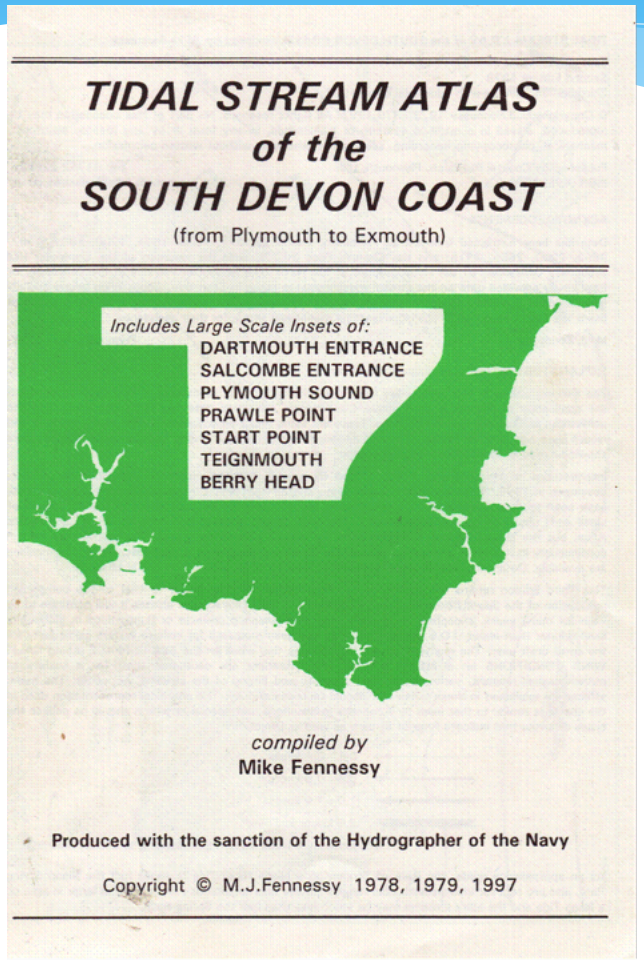
Calm conditions – wind and tide together

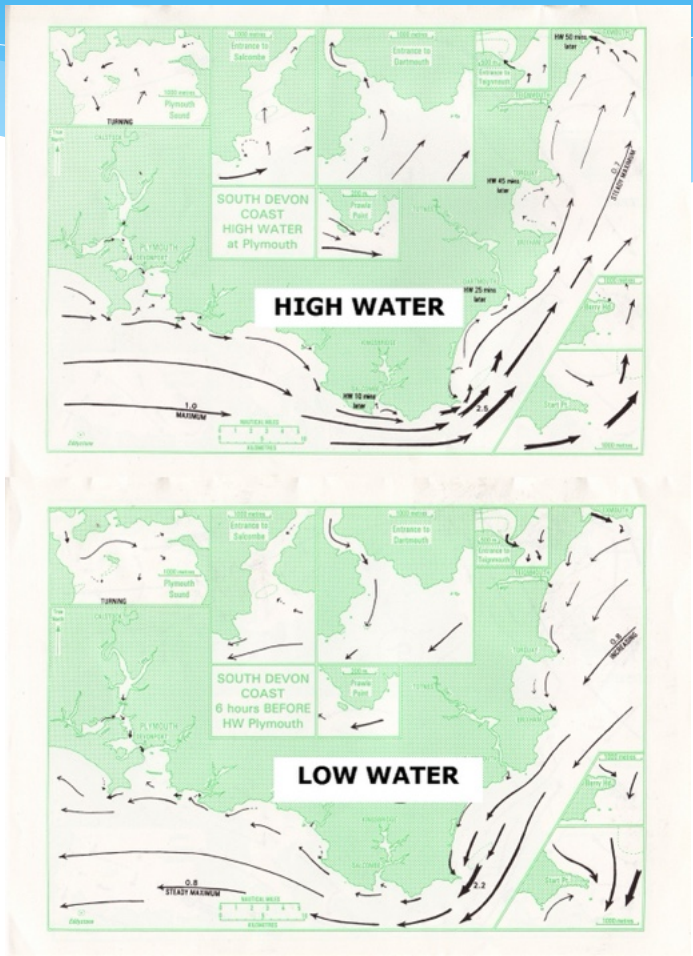
Why Tidal Streams matter to us?



An understanding can save lives!

The Tidal Stream Atlas we use





Tidal Set and Rate use the TSG

Around PQ it is location specific

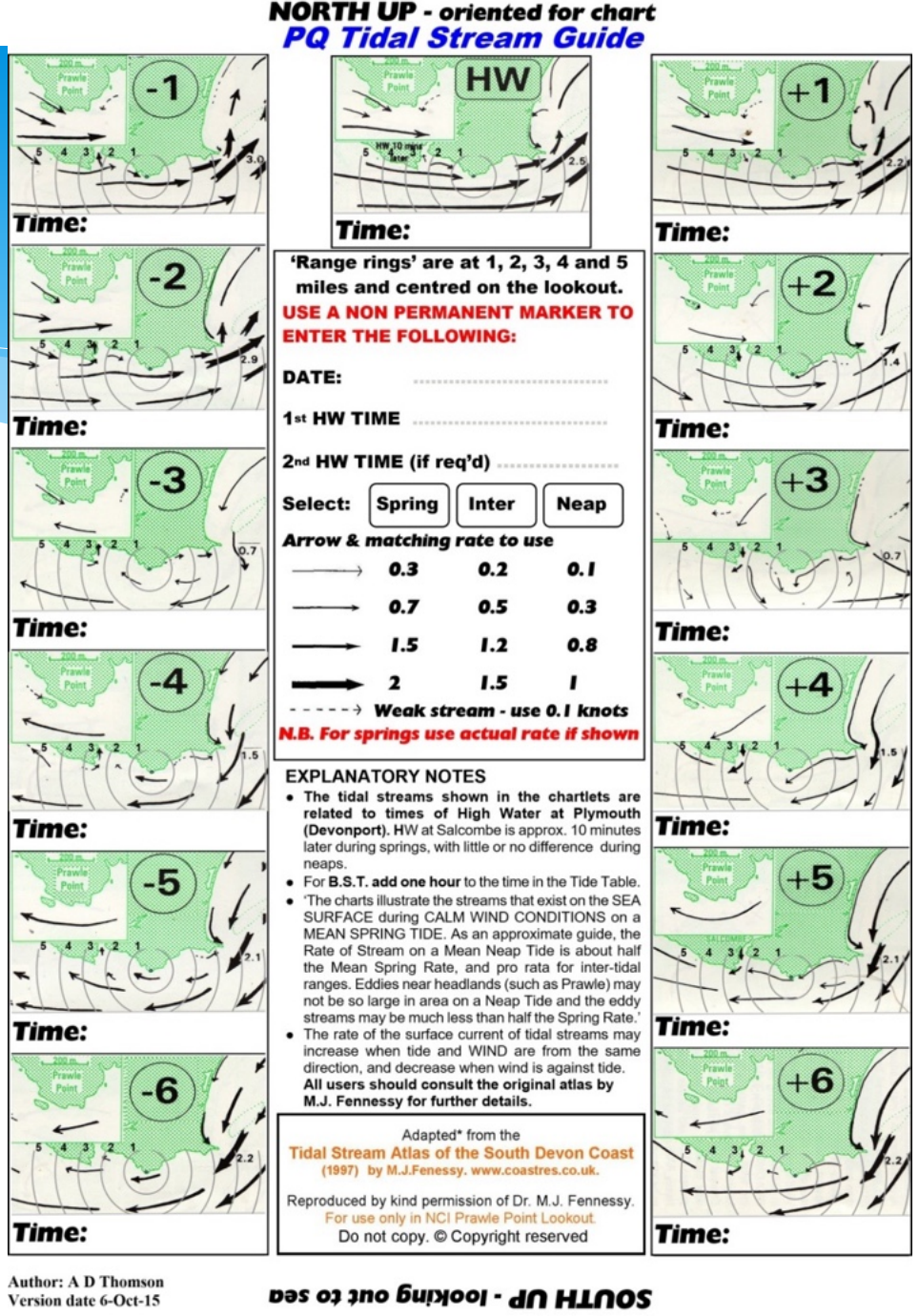
- Diamonds or radar can lead you astray!

Set

- Use the arrows
- PQ Rule of Thumb

Rate

- Use the arrows
- PQ Rule of thumb



TIMING

Two simple assumptions …

If HW-3 were at 15:00

THEN

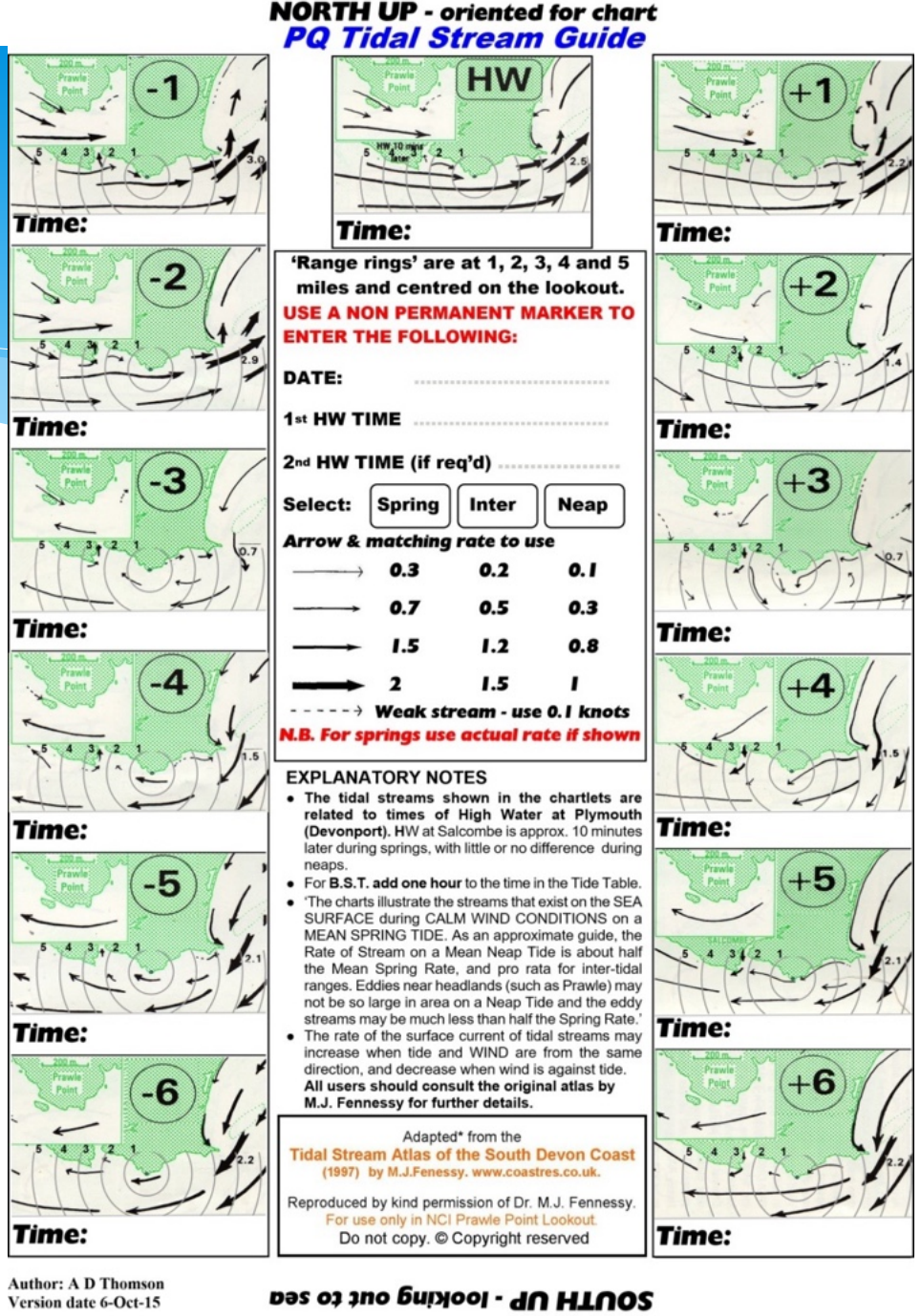
The tide chartlet applies from 14:30 to 15:30

Work FORWARD from 1st HW to HW+6

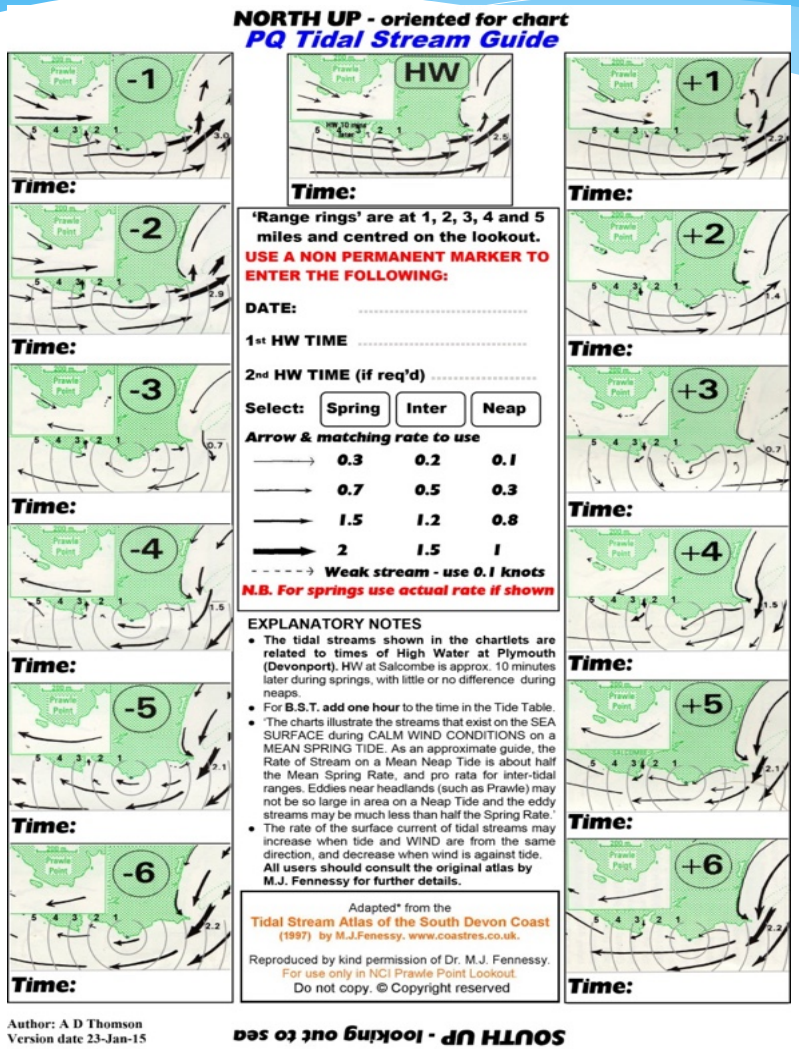
THEN

Work backward from 2nd HW to HW -6

HW+6 and HW-6 are NEVER the same time!



Exercise 7 Tidal Streams



Let's fill one in for 6th Nov 2021 with 1st High Water at 06:37hrs and the 2nd High Water at 18:55hrs

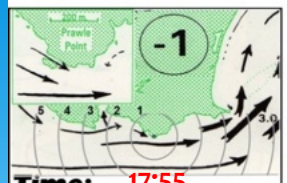
Will it be springs or neaps?

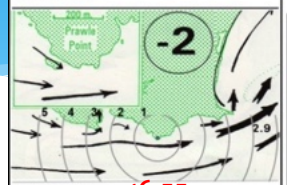
Exercise 7

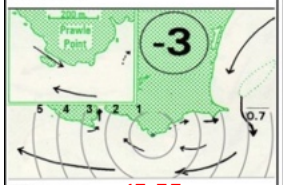
Answers

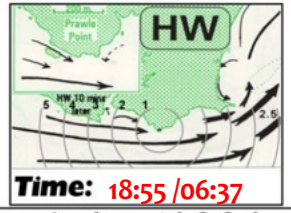
NORTH UP - oriented for chart

PQ Tidal Stream Guide









'Range rings' are at 1, 2, 3, 4 and 5 miles and centred on the lookout.

USE A NON PERMANENT MARKER TO ENTER THE FOLLOWING:

DATE: 6th Nov 21

1st HW TIME 06:37

2nd HW TIME (if req'd) 18:55

Select: Spring X | Inter | Neap

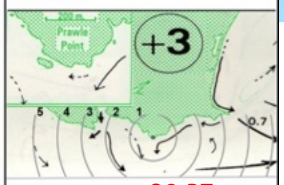
Arrow & matching rate to use

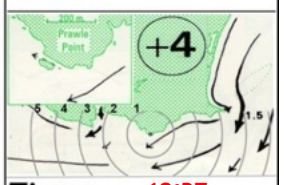
⟶	0.3	0.2	0.1
⟶	0.7	0.5	0.3
⟶	1.5	1.2	0.8
⟶	2	1.5	1
- - - - ⟶	Weak stream - use 0.1 knots		

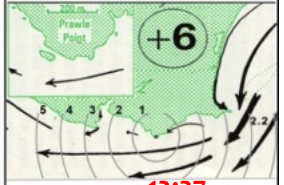
N.B. For springs use actual rate if shown

EXPLANATORY NOTES

- **The tidal streams shown in the chartlets are related to times of High Water at Plymouth (Devonport).** HW at Salcombe is approx. 10 minutes later during springs, with little or no difference during neaps.
- For **B.S.T. add one hour** to the time in the Tide Table.
- 'The charts illustrate the streams that exist on the SEA SURFACE during CALM WIND CONDITIONS on a MEAN SPRING TIDE. As an approximate guide, the Rate of Stream on a Mean Neap Tide is about half the Mean Spring Rate, and pro rata for inter-tidal ranges. Eddies near headlands (such as Prawle) may not be so large in area on a Neap Tide and the eddy streams may be much less than half the Spring Rate.'
- The rate of the surface current of tidal streams may increase when tide and WIND are from the same direction, and decrease when wind is against tide. **All users should consult the original atlas by M.J. Fennessy for further details.**



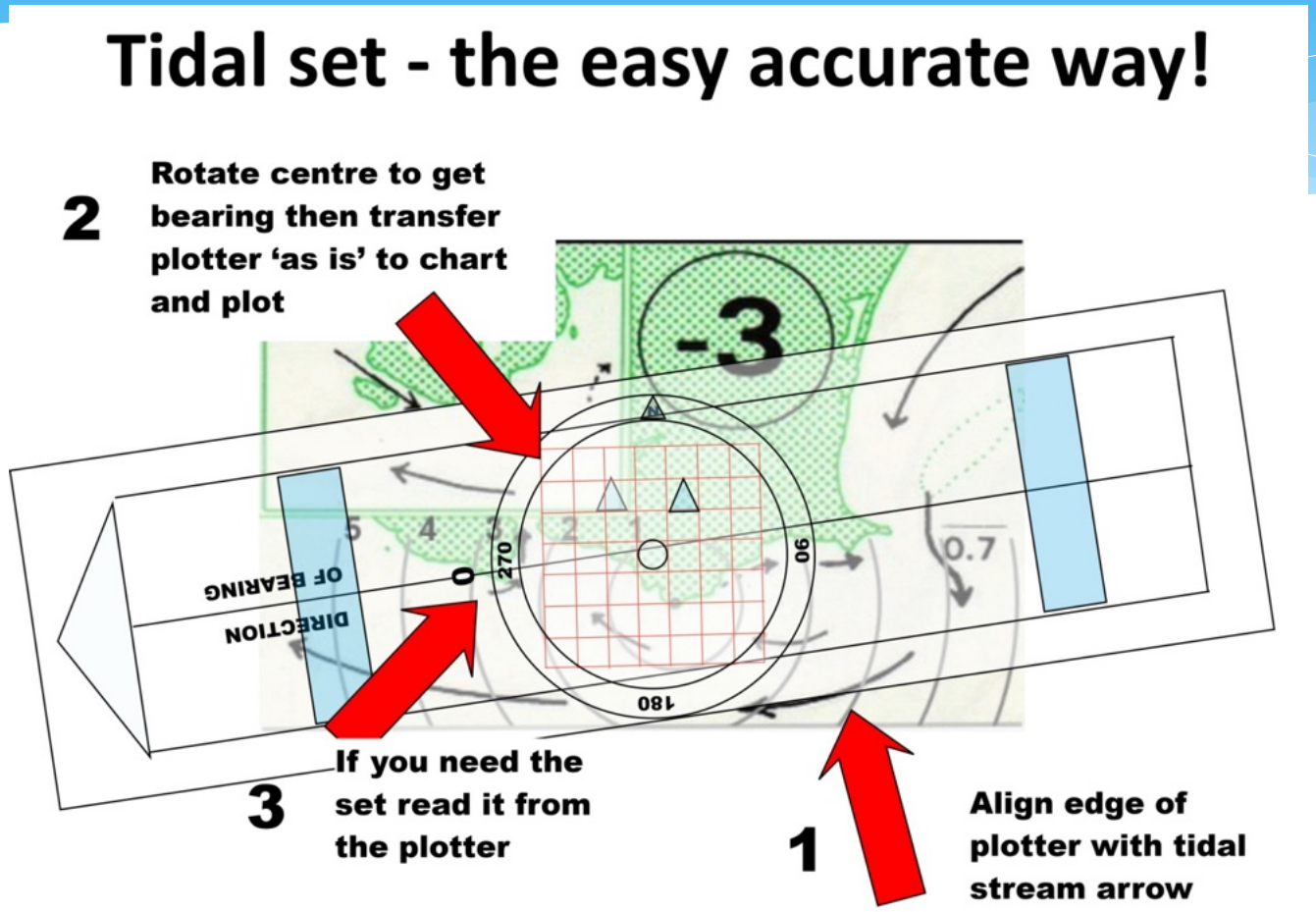




Author: A D Thomson
Version date 6-Oct-15

SOUTH UP - looking out to sea

Plotter and Tidal Streams



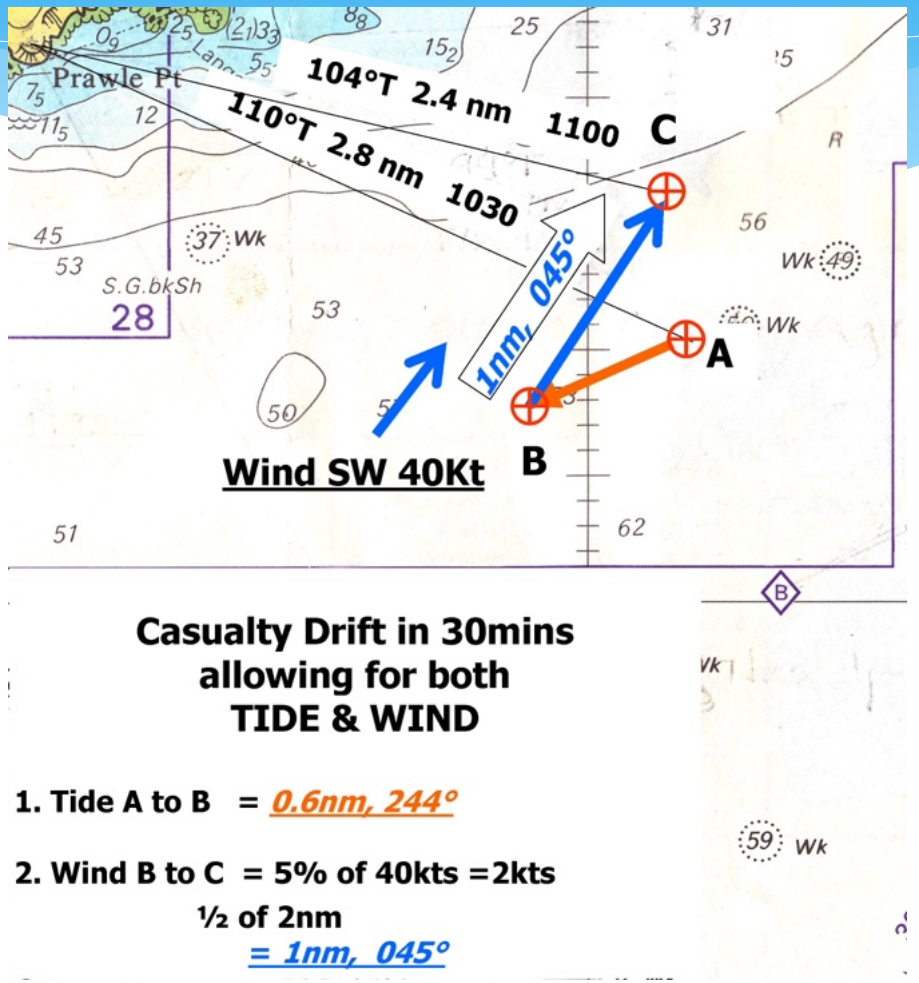
Plotting a target

Improve accuracy in stages

1. Plot position
2. Plot tidal drift
3. Plot wind drift

Allowing for wind and tidal drift

In addition to tidal drift, boats and life rafts will also be affected by the wind, drifting down-wind (±60˚) at about 5% of wind speed



Estimating time of arrival

1 Knot = 1 NM per hour

The **AWLB** maximum operating speed is 25 Knots
The **ILB** maximum operating speed is 35 Knots

Time (in minutes) = 60 x distance (in NM) / speed (in Knots)