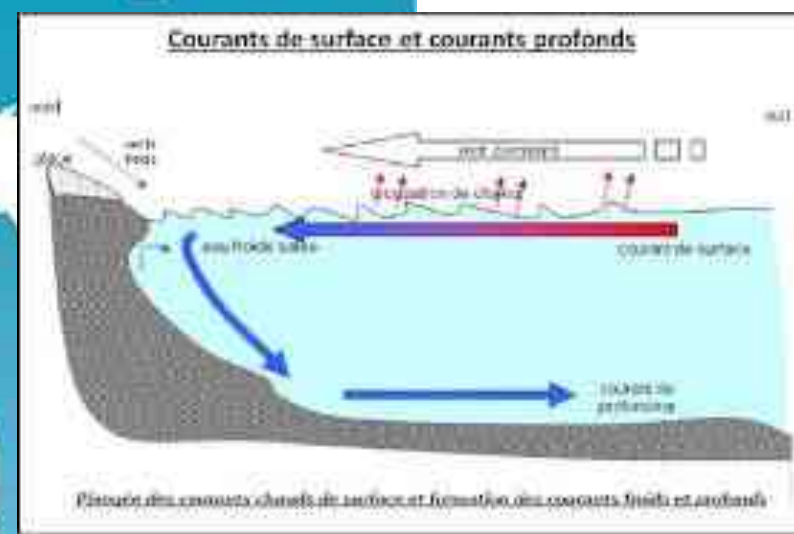
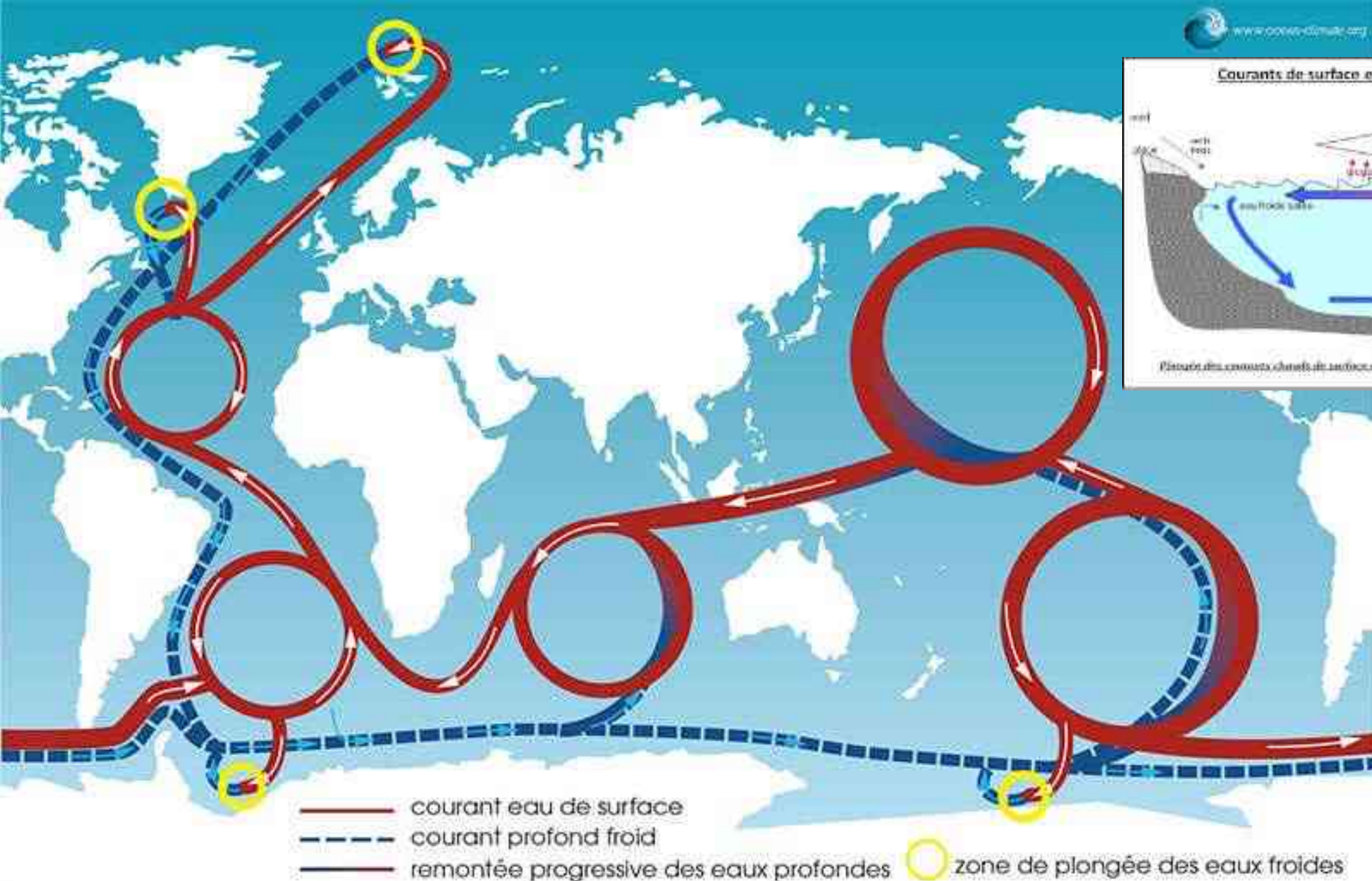


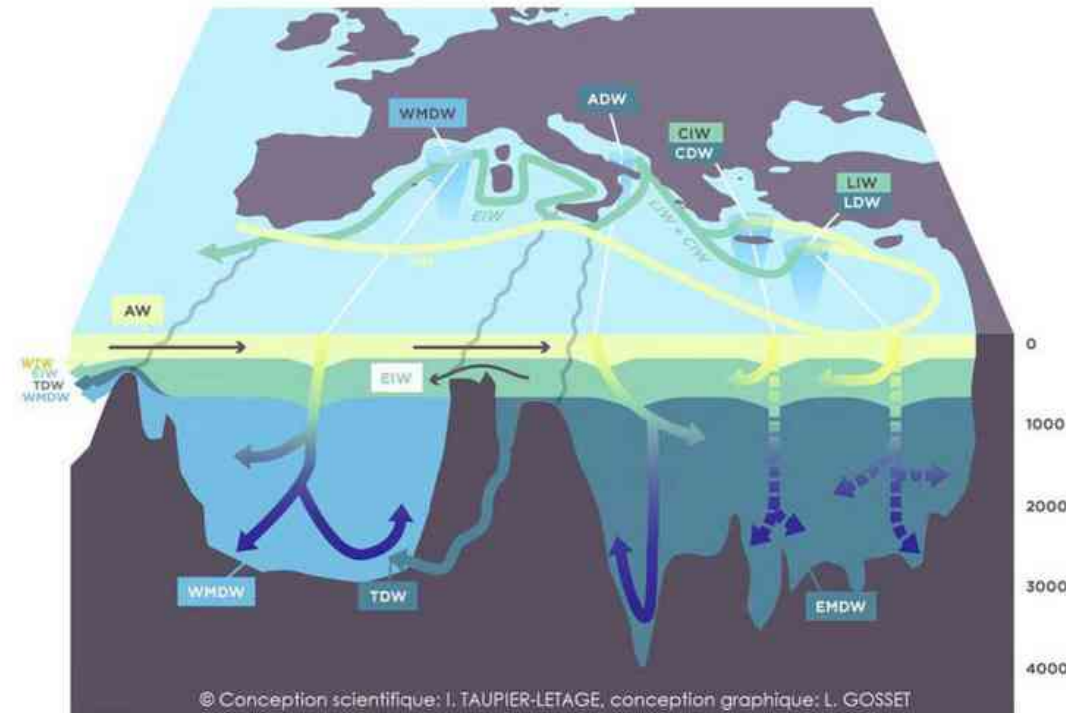
Tidal streams



## Schéma de la circulation thermohaline en Méditerranée

Profondeur

- Moyenne 1 500 m
- Maximale 5 369 m



Ellipses bleues: zones de formation d'eau profonde par convection

AW: Atlantic Water

LIW: Levantine Intermediate Water

CIW: Cretan Intermediate Water

EIW: Eastern Intermediate Water (mélange de LIW + CIW à l'ouest du canal de Sicile)

WIW: Western Intermediate Water

ADW: Adriatic Deep Water

CDW: Cretan Deep Water \*

LDW: Levantine Deep Water \*

EMDW: Eastern Mediterranean Deep Water

TDW: Tyrrhenian Deep Water

WMDW: Western Mediterranean Deep Water

\* : en tirets car plus épisodique



# Tidal streams



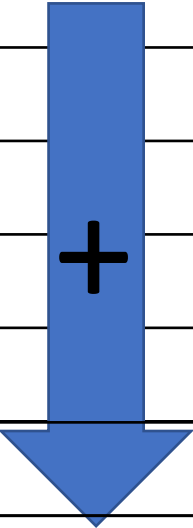
Tidal streams are defined:

- by a direction ( $^{\circ}$ T)
- and a speed/force (knots)

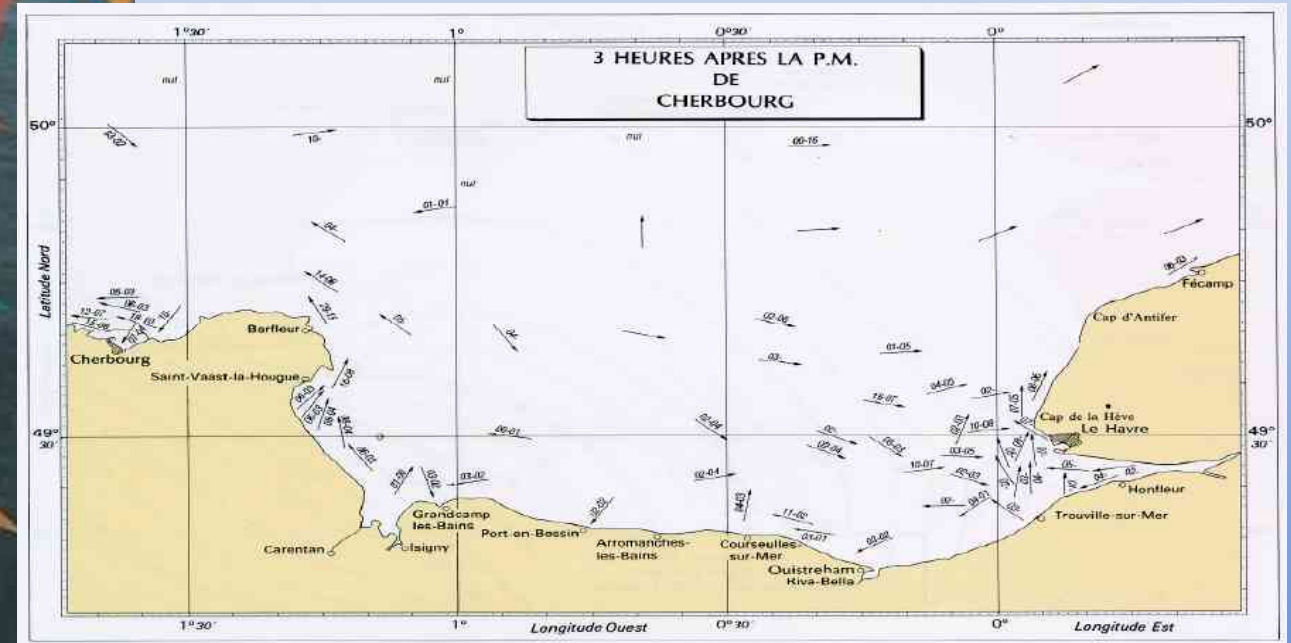




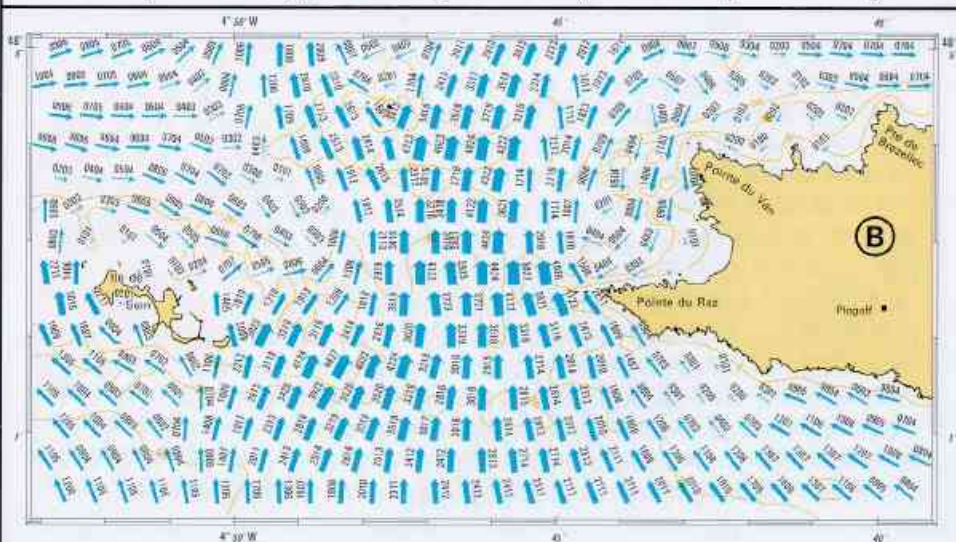
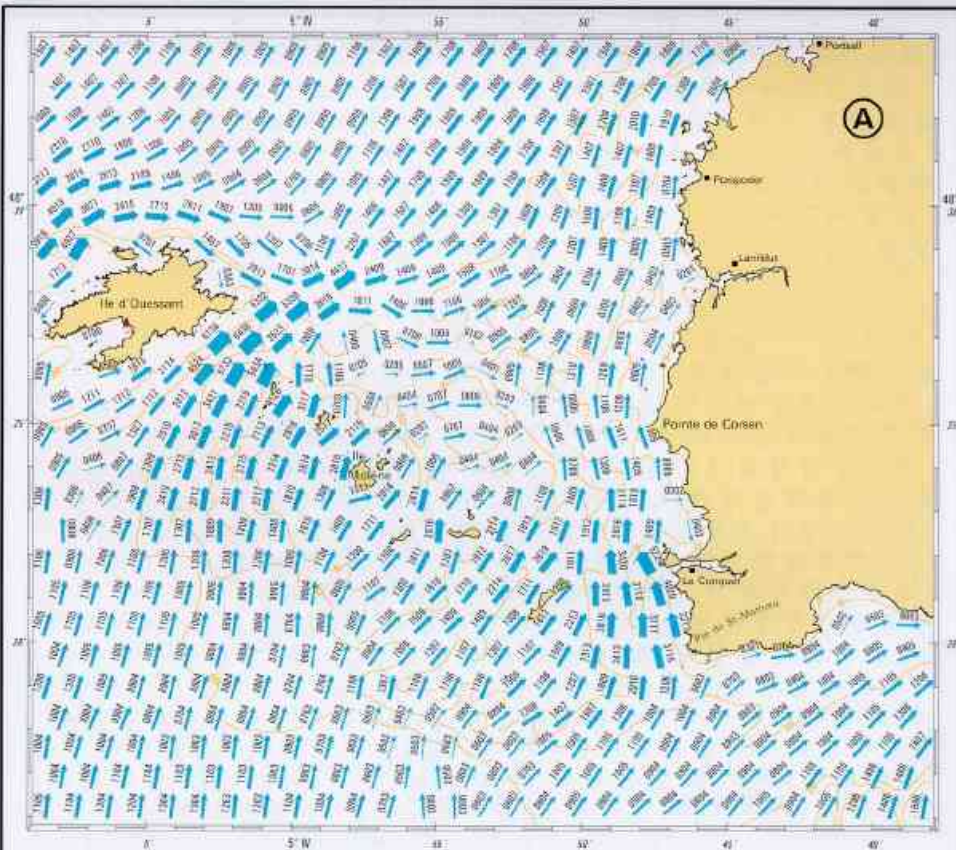
# Kurs

MgK	
+ Abl	
MwK	
+ Mw	
RwK	
+ BW	
KdW	
+ BS	
KüG / KaK	

# Navigation in Tidengewässer





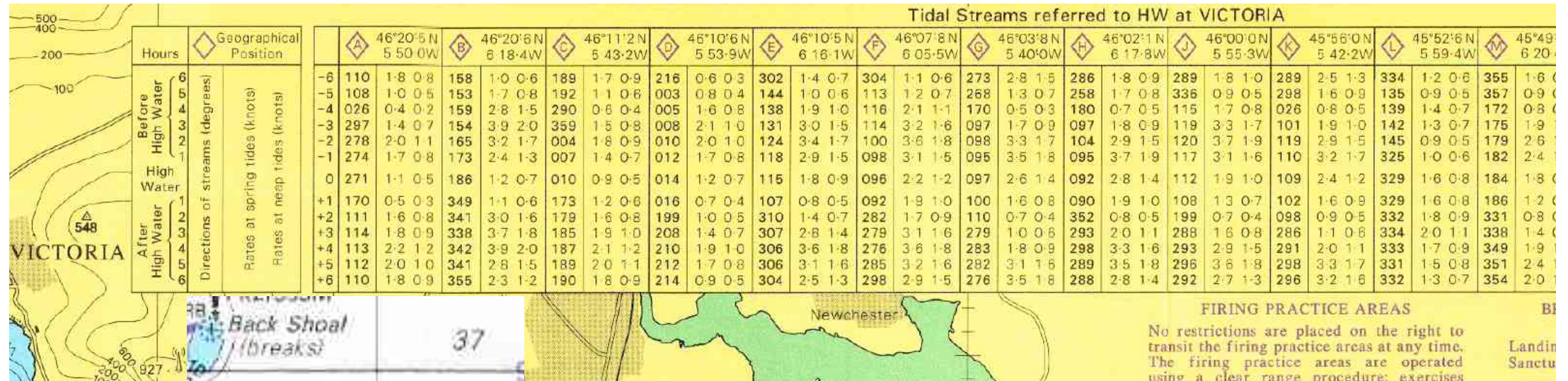


# The tidal stream

- Direction
  - In degrees compared to the geographical (true) North
- Force (speed)
  - kn or 1/10 of kn
- vector




# Charts





## Tidal Diamond from Chart

Victoria 

Hours		 46°20'5 N 5 50.0W		
Before High Water	6	-6	110	1.8 0.8
	5	-5	108	1.0 0.5
	4	-4	026	0.4 0.2
	3	-3	297	1.4 0.7
	2	-2	278	2.0 1.1
	1	-1	274	1.7 0.8
High Water		0	271	1.1 0.5
After High Water	1	+1	170	0.5 0.3
	2	+2	111	1.6 0.8
	3	+3	114	1.8 0.9
	4	+4	113	2.2 1.2
	5	+5	112	2.0 1.0
	6	+6	110	1.8 0.9

Spring rate (kn)

Neap rate (kn)

Direction (°T)

Time relative to HW  
of reference port



# Training Almanac pages 12 - 25

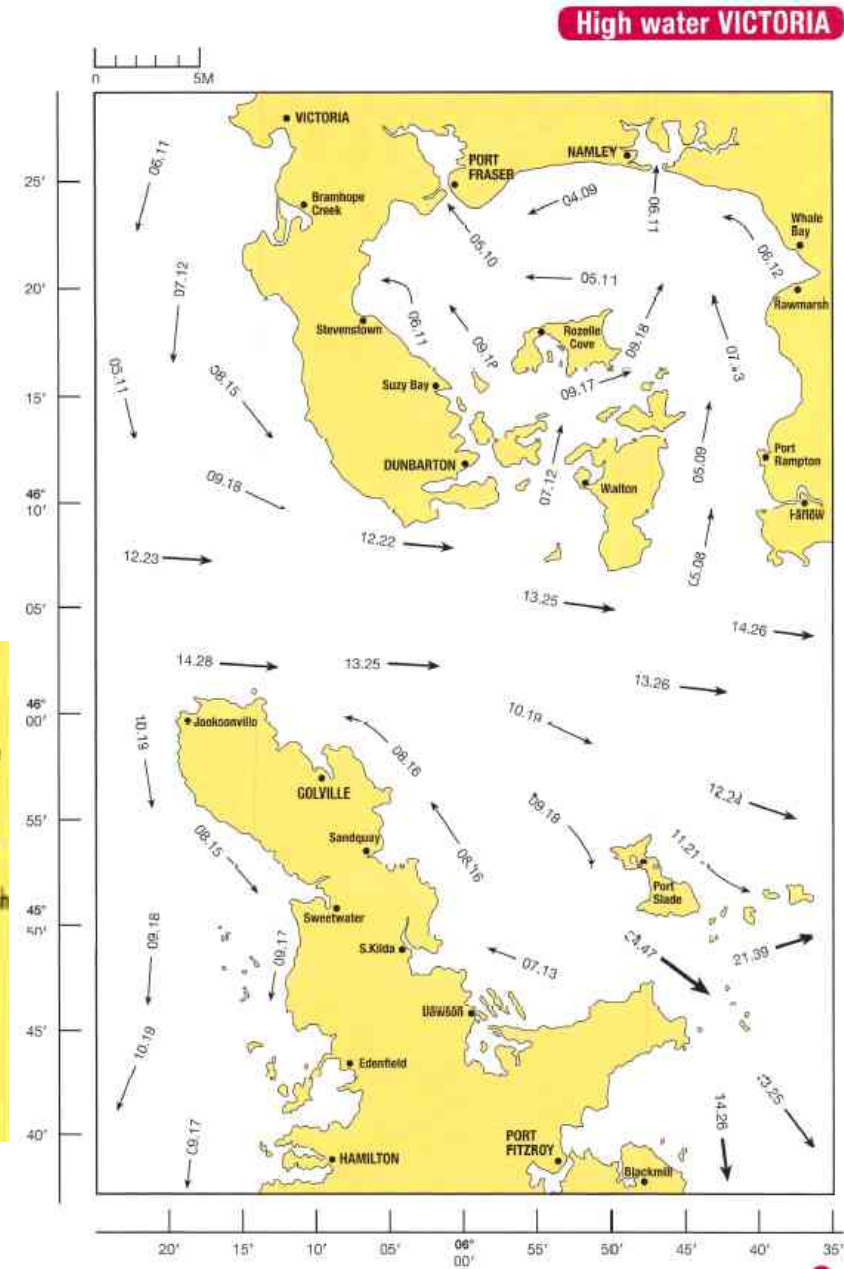
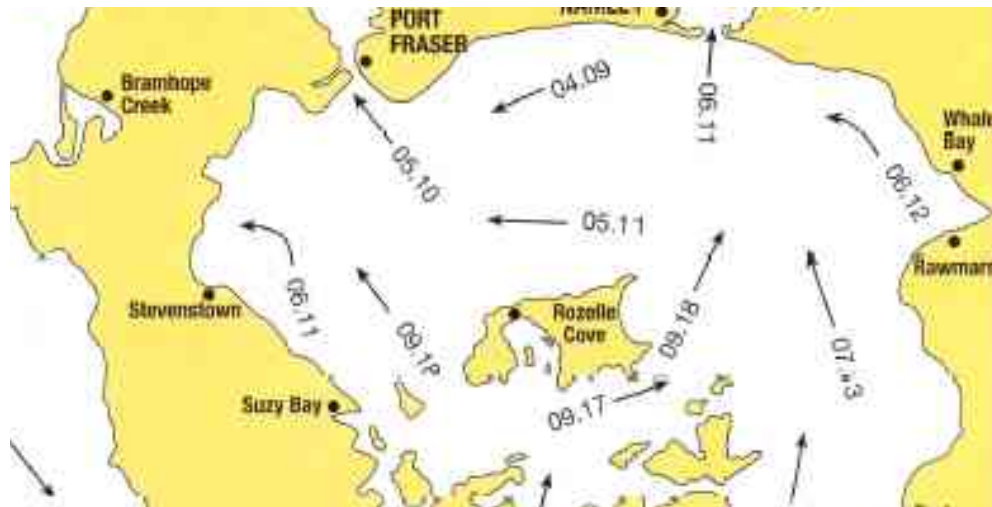
## VICTORIA - Standard Port

**TIME ZONE UT**  
For Summer Time add ONE  
hour in non-shaded areas

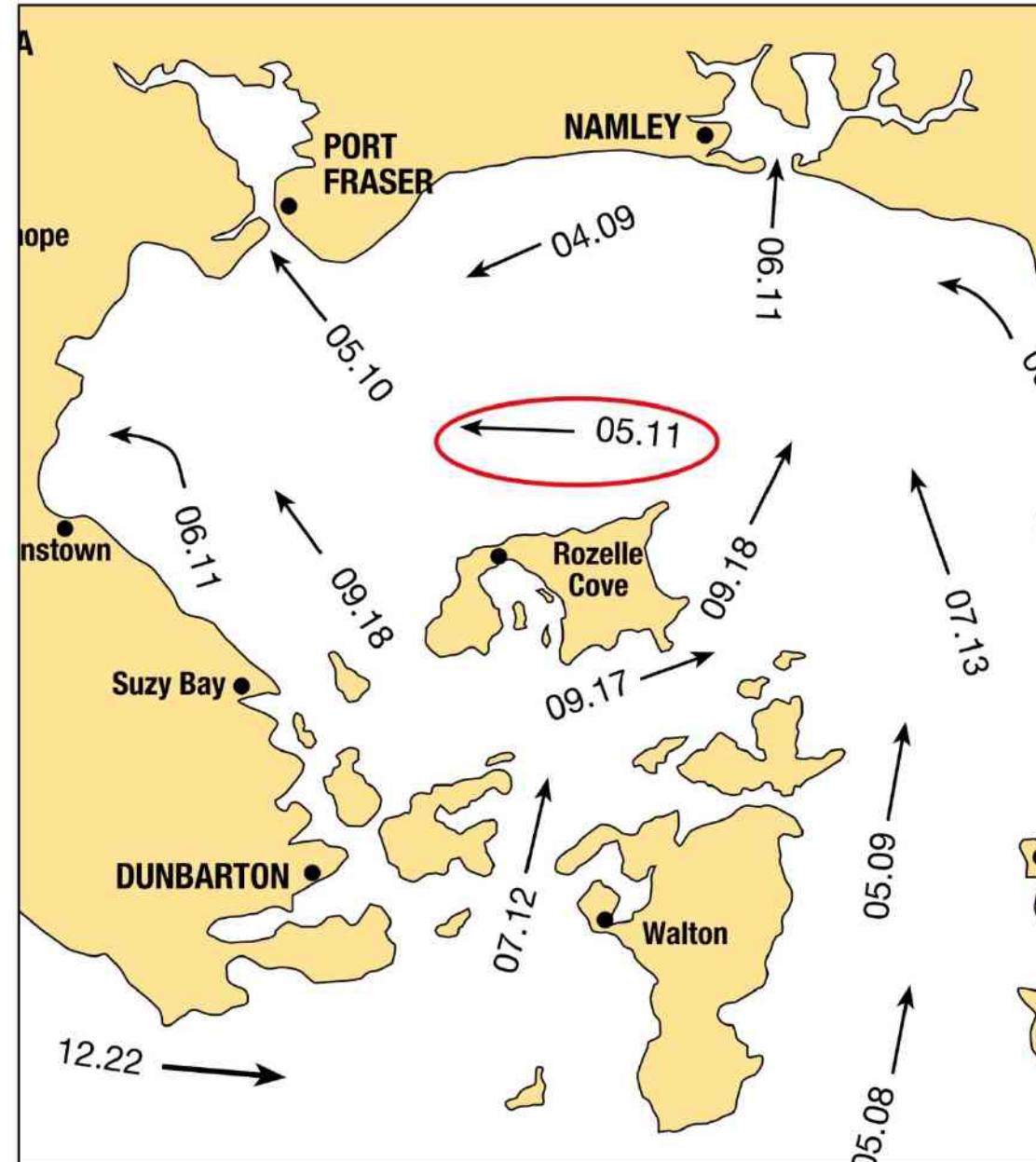
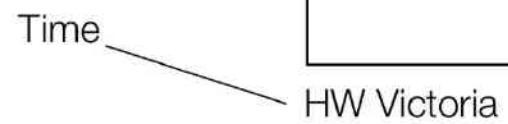
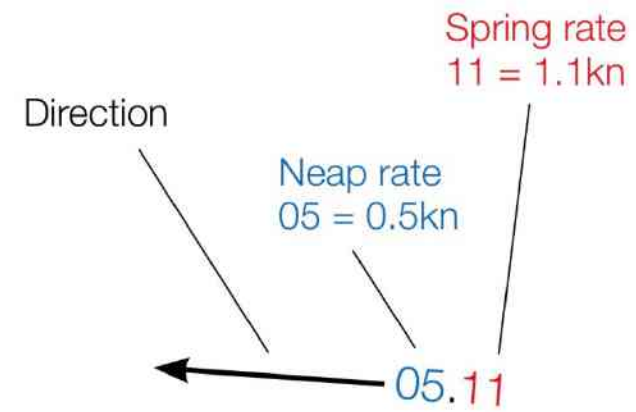
**SPRING & NEAP TIDES**  
Dates in red are **SPRINGS**  
Dates in blue are **NEAPS**

TIMES AND HEIGHTS OF HIGH AND LOW WATERS

JANUARY				FEBRUARY				MARCH				APRIL			
Time	m	Time	m	Time	m	Time	m	Time	m	Time	m	Time	m	Time	m
1 0510	0.9	16 0549	1.2	1 0028	5.7	16 0028	5.1	1 0524	0.3	16 0532	5.9	1 0024	5.7	16 0000	5.3
TU 1126	5.8	W 1201	5.5	F 0627	0.6	SA 0629	1.2	F 1139	6.2	SA 1142	5.5	M 0628	0.4	TU 0607	1.0
TU 1742	0.7	W 1814	1.1	F 1245	6.0	SA 1242	5.4	F 1758	0.0	SA 1750	0.9	M 1247	5.8	TU 1219	5.2
2354	5.6			1903	0.4	1851	1.1	2359	5.2	1856	0.6	1821	1.1		



## Tidal Stream Atlas



# Example

- 5 NM SSW Namley Harbour
- 19 August at 1100 DST
- force and direction of current?



# 1. HW Victoria

19		Time	m
		0123	1.7
		0751	4.7
	M	1354	1.7
		2012	5.0

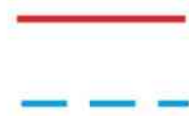
0751 UT

0851 DST is the nearest HW



## 2. Springs or Neaps

MEAN RANGES	
Springs	4.9m
Neaps	2.4m

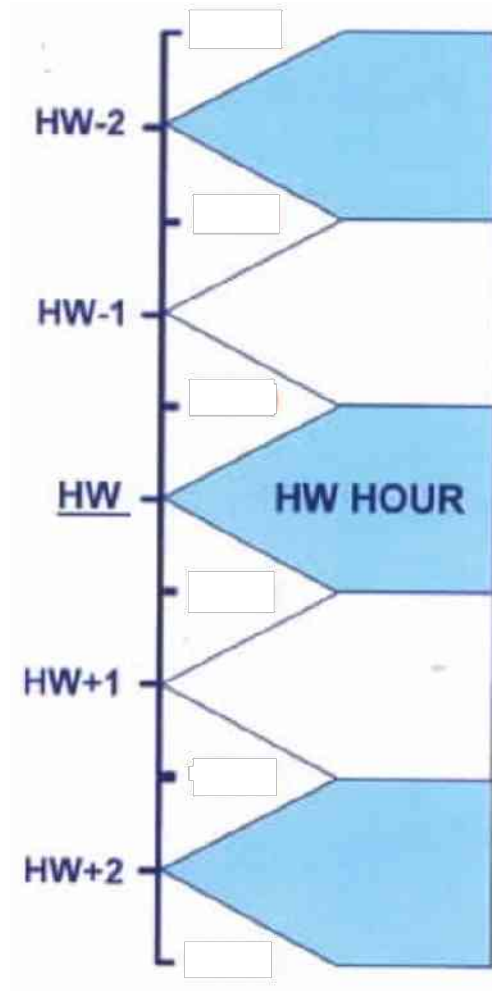


4.7 m

-1.7 m

Tidal range: 3.0 m

### 3. Time before/after HW



HW Victoria  
0851 DST

HW is taken as the  
midpoint of the hour

Answer +2 hours

HW 0851

+1 0951

+2 1051

0821

0921

1021

1121

A diagram showing time offsets from HW 0851. A black arrow points from the text "HW 0851" to "0821". A red arrow points from the text "+1 0951" to "0921". Another red arrow points from the text "+2 1051" to "1021". A fourth red arrow points from the text "+2 1051" to "1121". The times 0821, 0921, 1021, and 1121 are listed on the right side of the diagram.

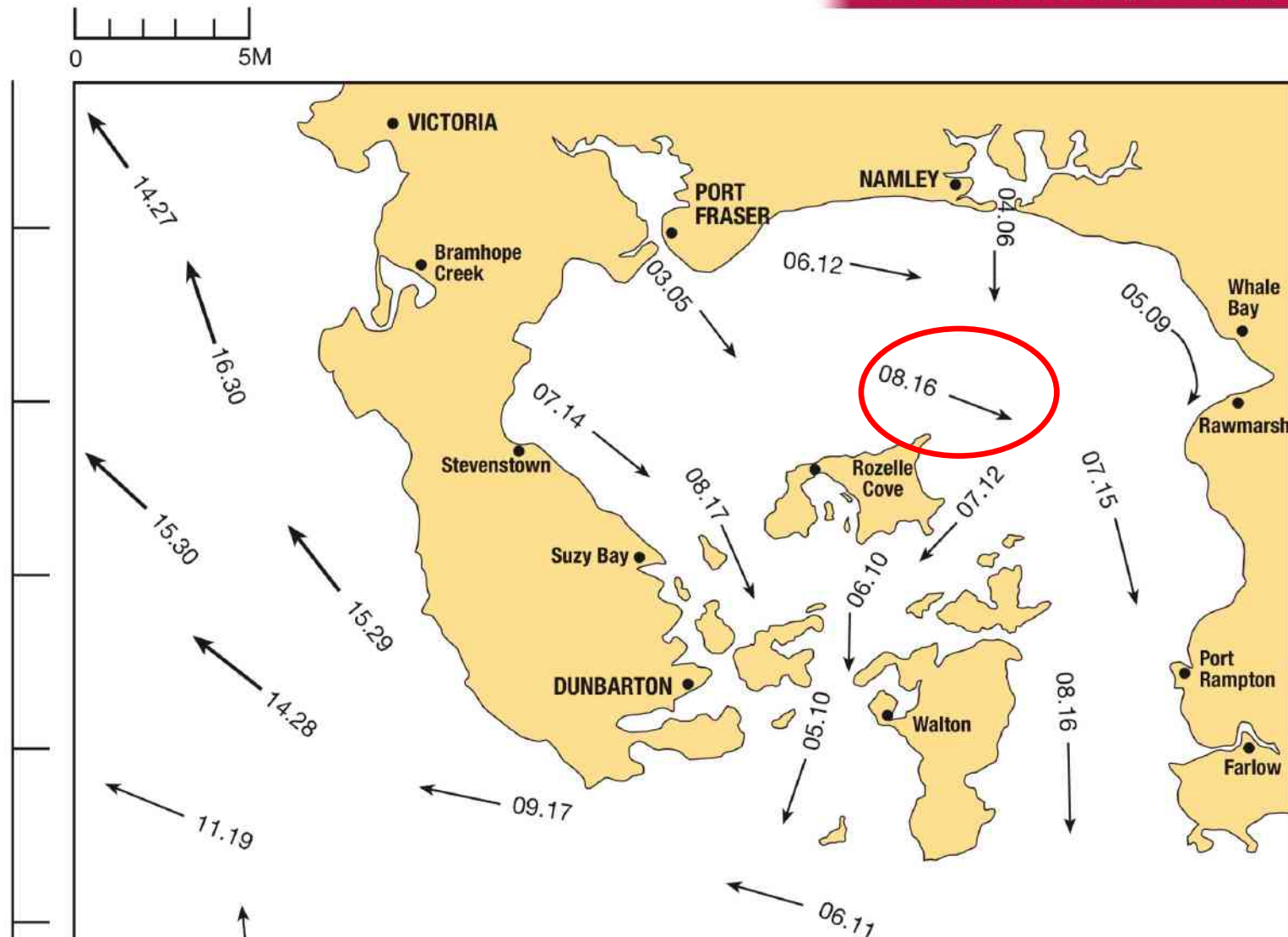
## 4. Closest diamond



	<div><div>A</div></div>	46°20'5 N	5 50 0W
-6	110	1.8	0.8
-5	108	1.0	0.5
-4	026	0.4	0.2
-3	297	1.4	0.7
-2	278	2.0	1.1
-1	274	1.7	0.8
0	271	1.1	0.5
+1	170	0.5	0.3
+2	111	1.6	0.8
+3	114	1.8	0.9
+4	113	2.2	1.2
+5	112	2.0	1.0
+6	110	1.8	0.9

## 4bis. Charts from the almanac

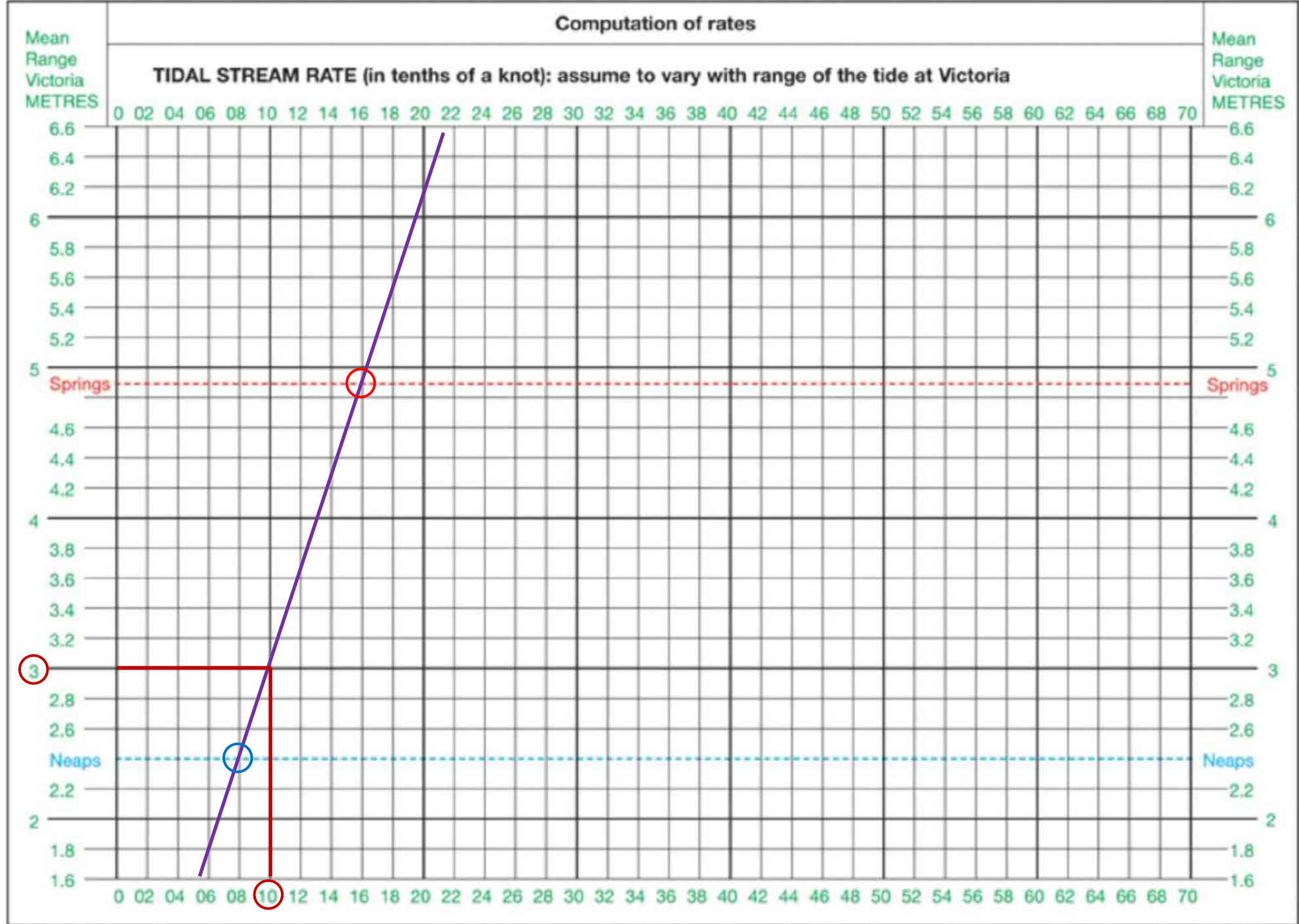
Two hours after HW Victoria





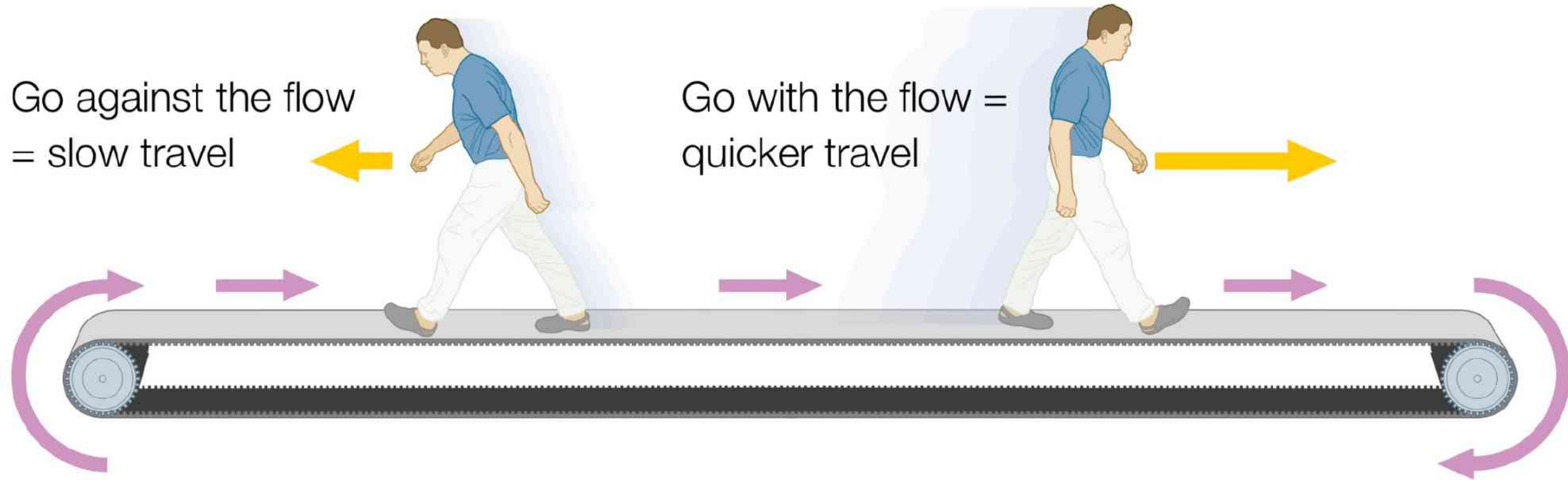
## 5. Speed of the tidal stream

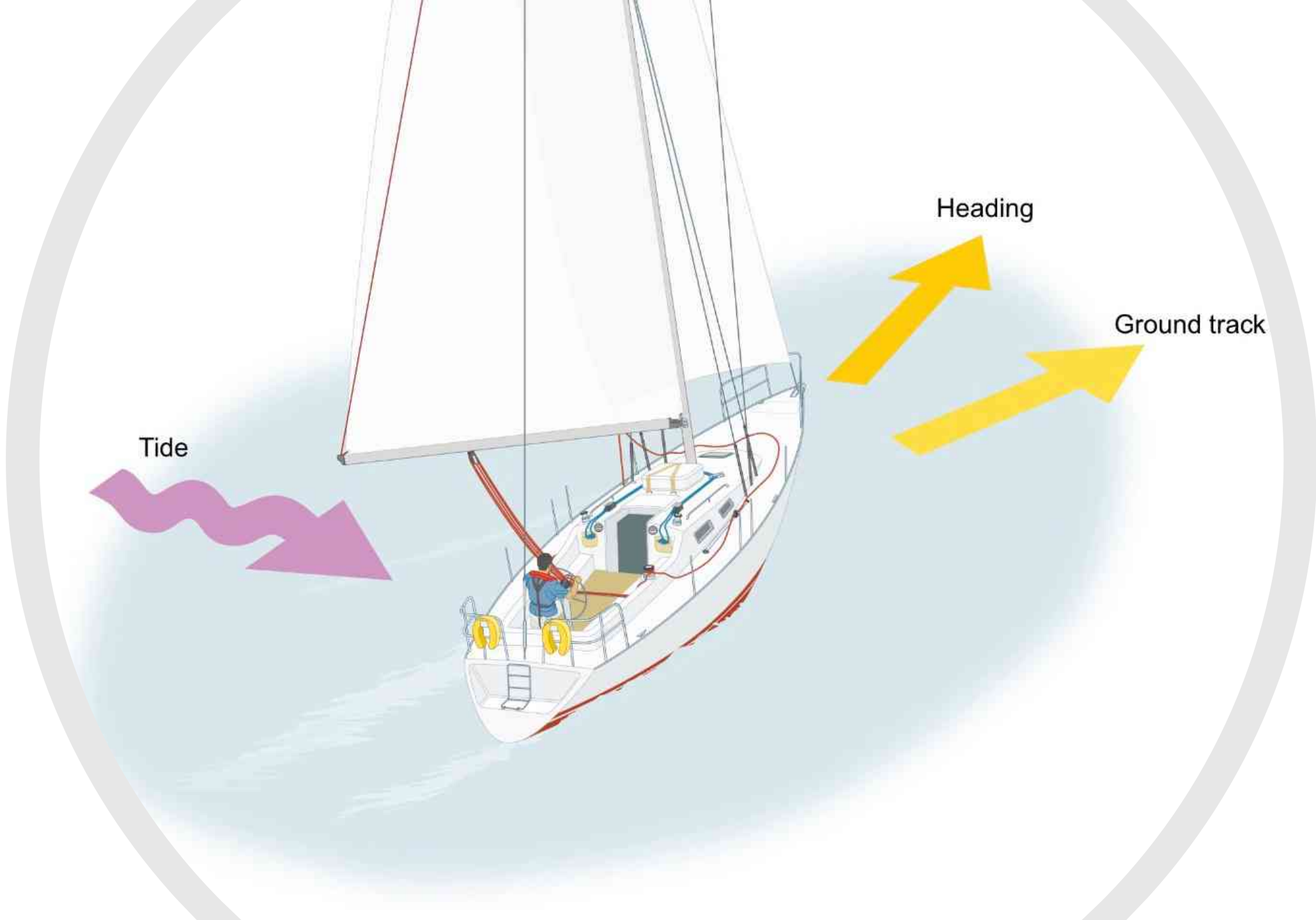
- computation of rates (page 26)



Go against the flow  
= slow travel

Go with the flow =  
quicker travel

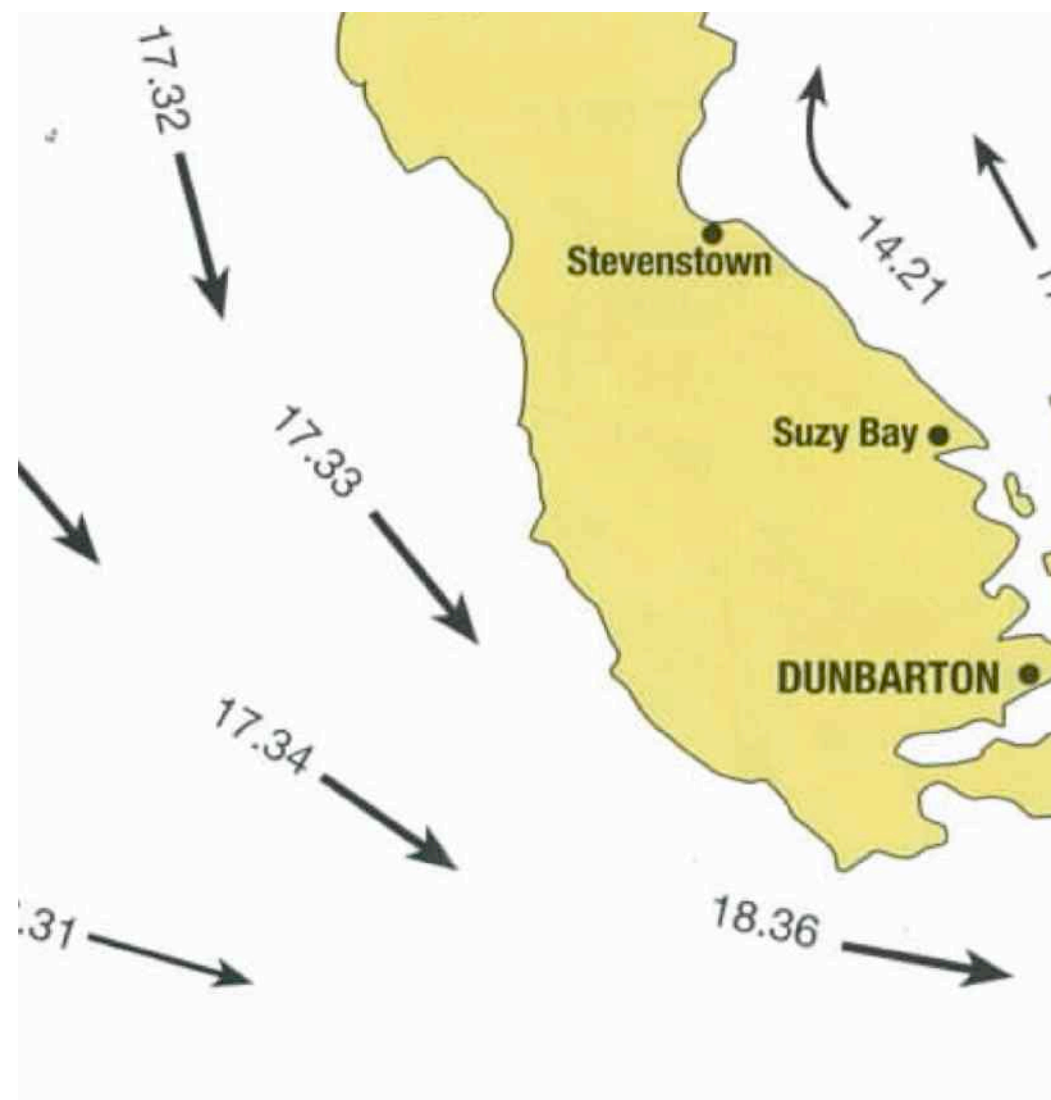




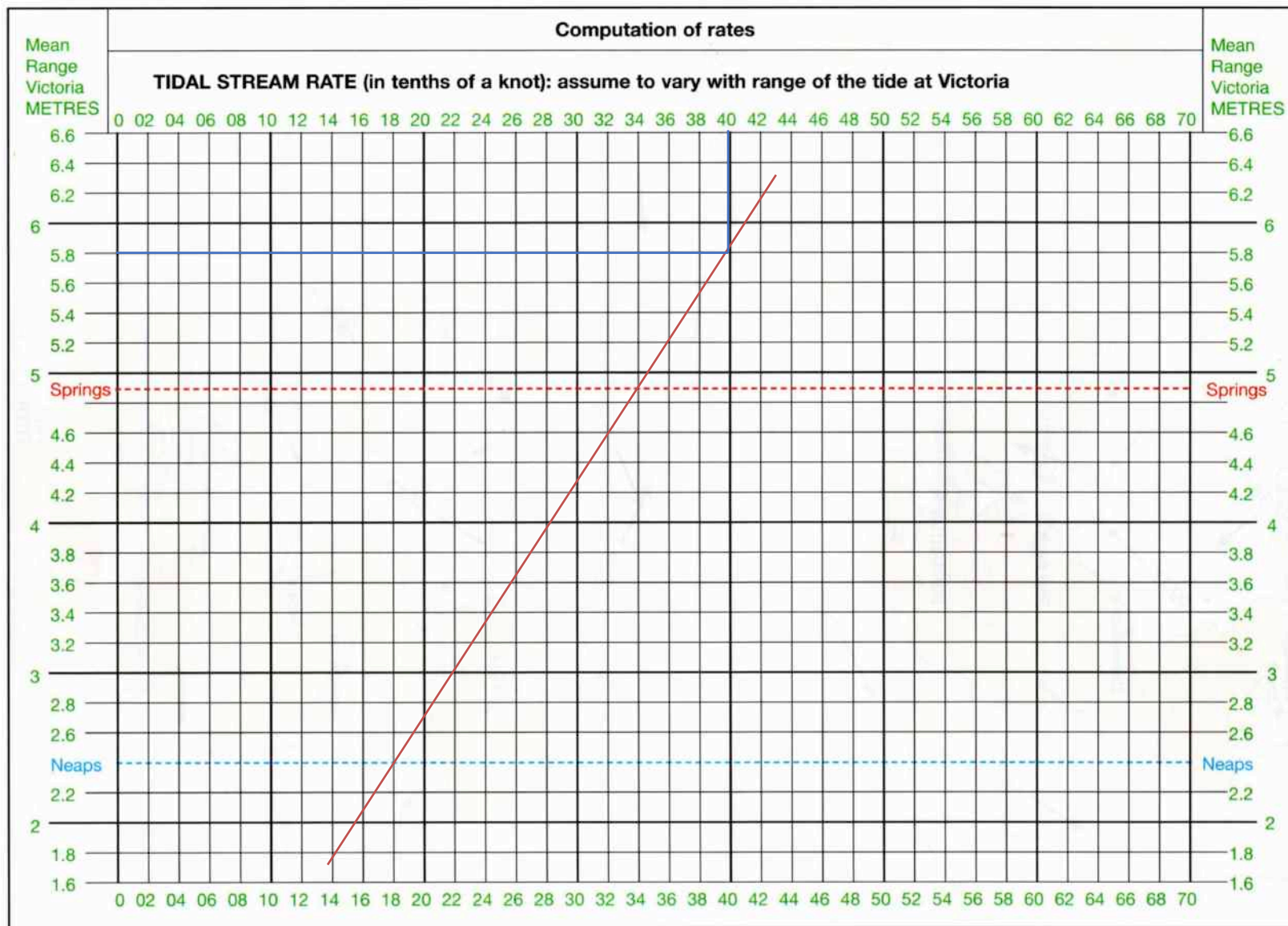


# Exercise

- 46° 15'.00 N; 006° 15'.00 W
- 19. February, 12:30
- 8. September, 21:12









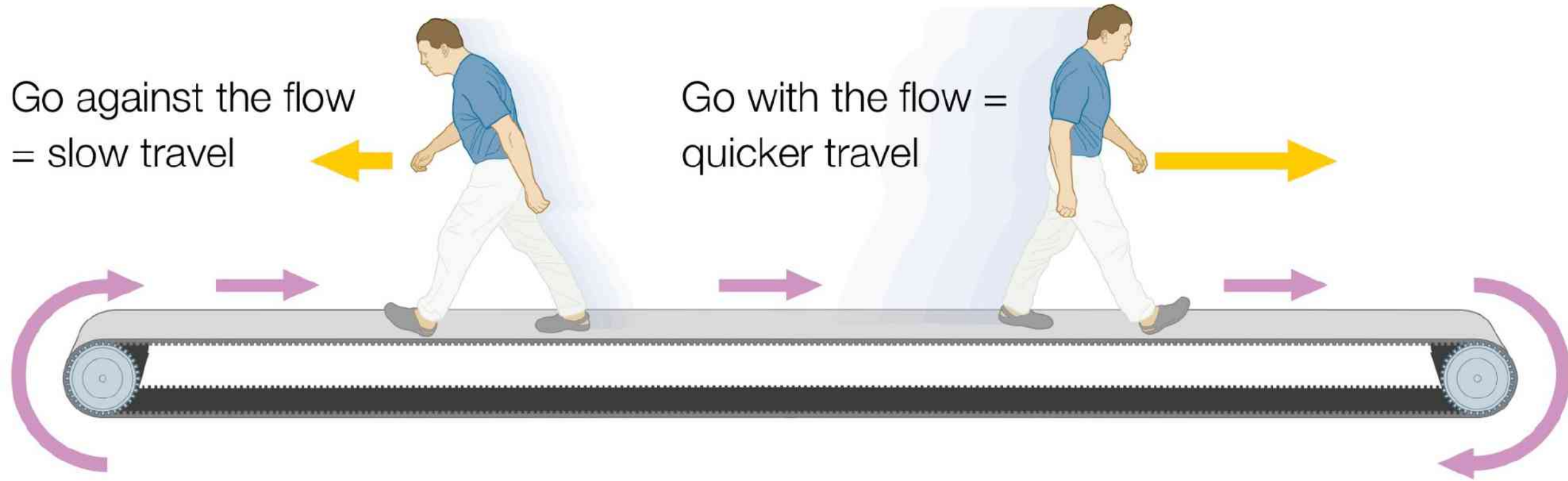
<b>MgK</b>	
<b>+ Abl</b>	
<b>= mwK</b>	
<b>+ Mw</b>	
<b>= rwK</b>	
<b>+ BW</b>	
<b>= KdW</b>	
<b>+ BS</b>	
<b>= KüG/KaK</b>	

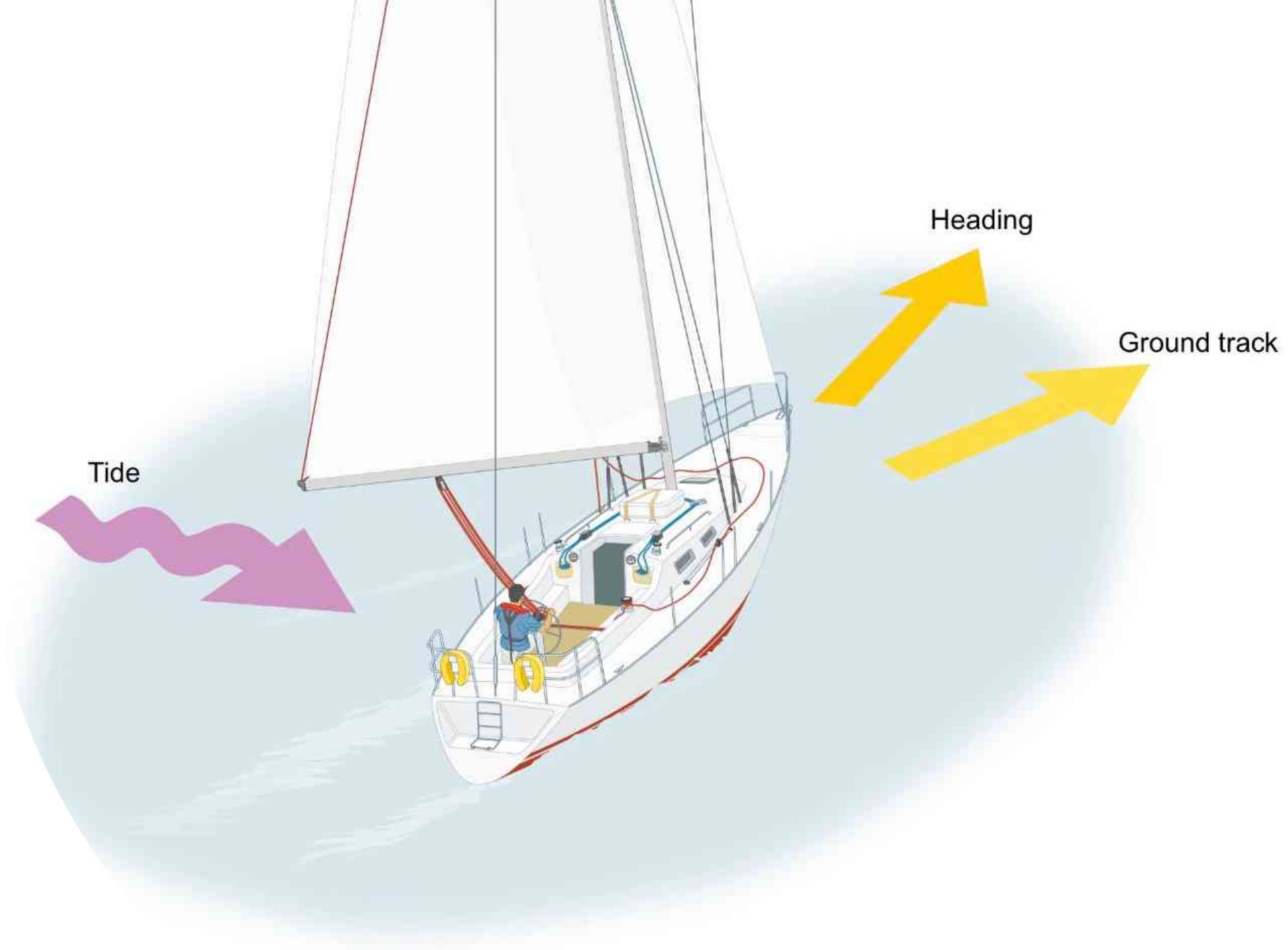
# Effect of tidal streams



Go against the flow  
= slow travel

Go with the flow =  
quicker travel

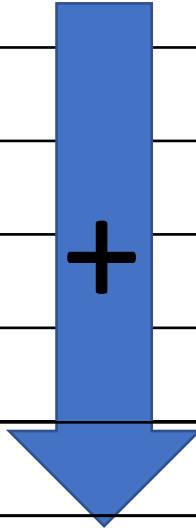






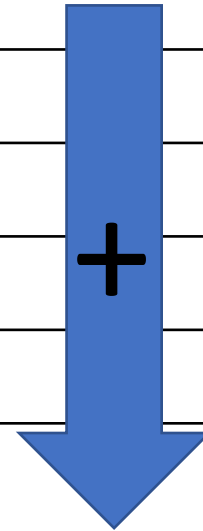
# Kurs

MgK	
+ Abl	
MwK	
+ Mw	
RwK	
+ BW	
KdW	
BS	
KüG / KaK	

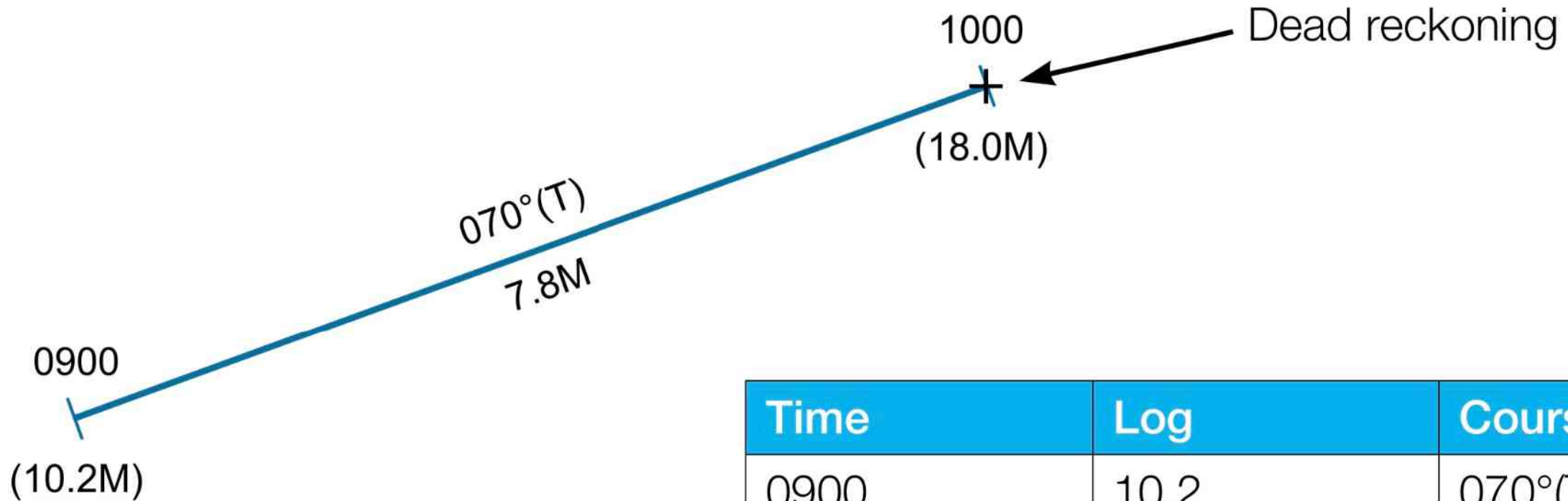


# Kurs

MgK	
+ Abl	
MwK	
+ Mw	
RwK	



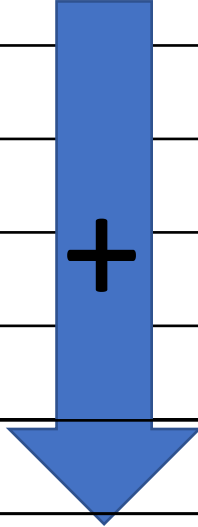
# Dead reckoning



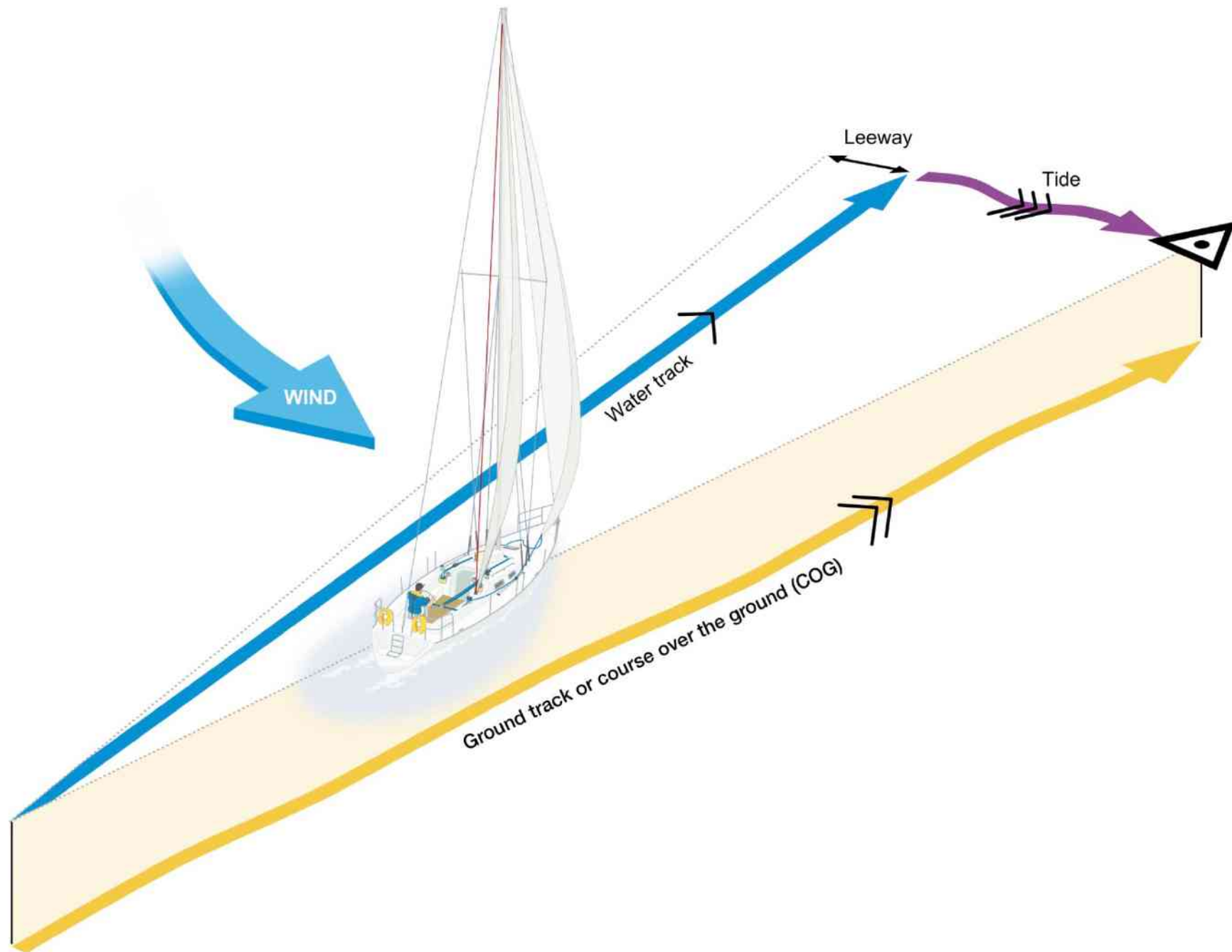
Time	Log	Course
0900	10.2	070°(T)
1000	18.0	070°(T)

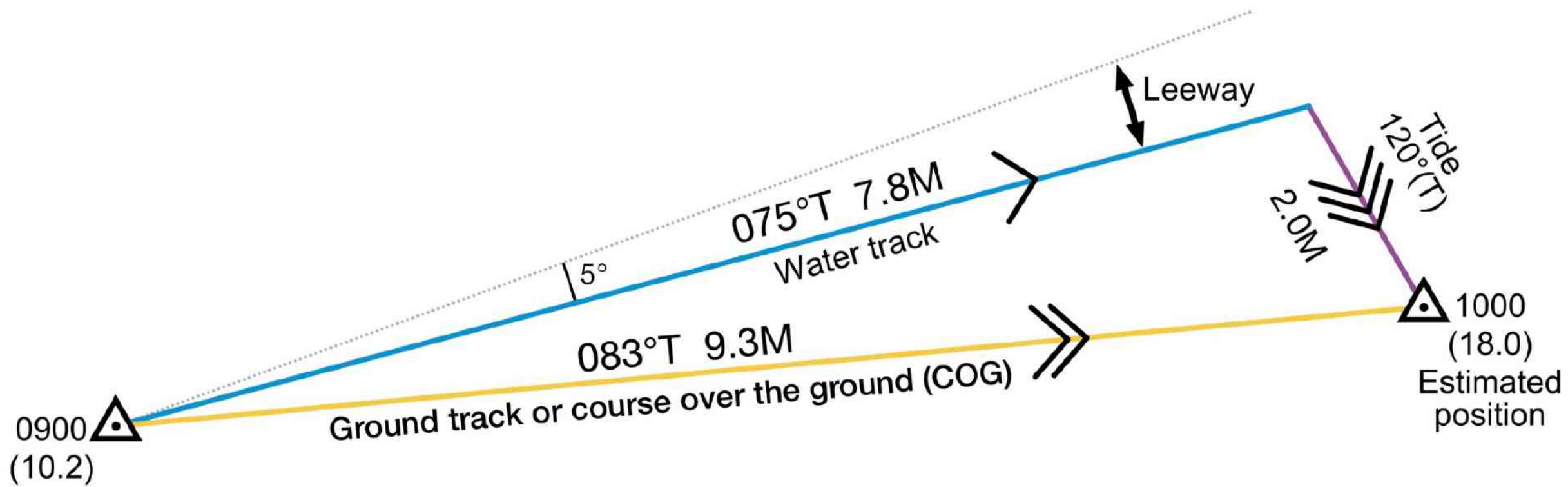
(7.8 miles travelled)

# Kurs

MgK	
+ Abl	
MwK	
+ Mw	
RwK	
+ BW	
KdW	
BS	
KüG / KaK	







# Position

 A dead reckoning position or **DR** is represented by a cross.

 An estimated position or **EP** is represented by a triangle.

 A fixed position or **fix** is represented by a circle.

# Exercise

## From the logbook of 8th of March

time	log	course (°M)	wind	leeway (°)	depth	notes
1635 UT	0.0	235	NE4	0	20	excit Victoria, N- entrance 46°26'.10N 006°13'.00W
1712 UT	4.8	235	NE4	0	51	West Point Ledge on port
1735 UT	7.9	235	NE4	0	130	

Dead reckoning at 1735UT

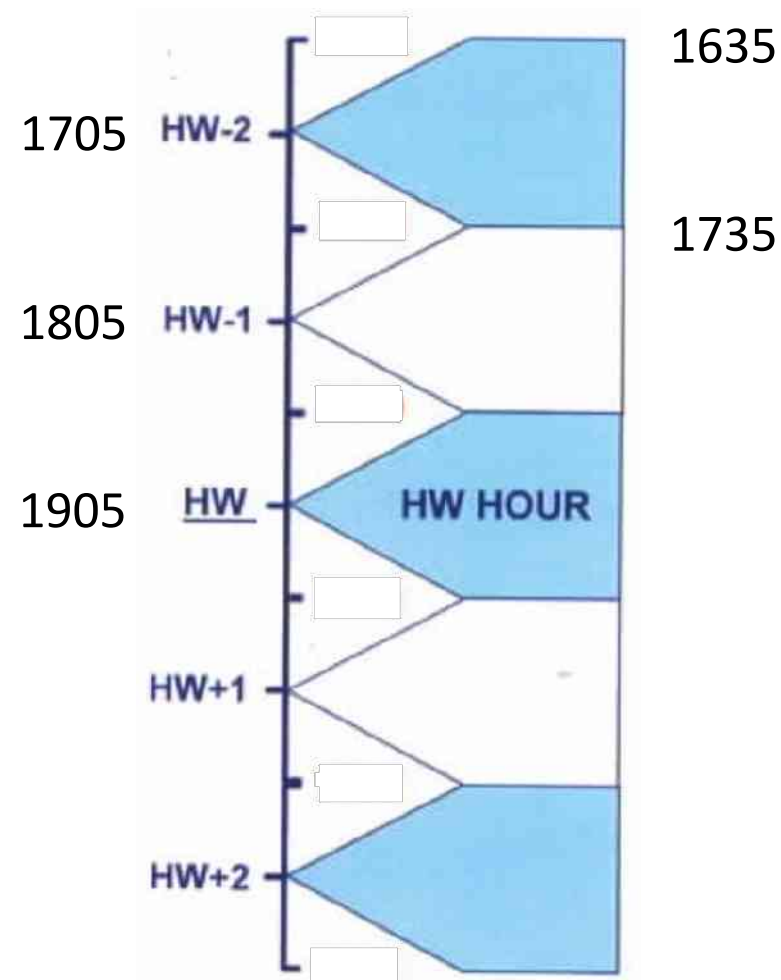
What was the distance to West Point Ledge lateral bouy?



<b>8</b>	0603	4.4
	1225	2.0
	F 1905	4.4

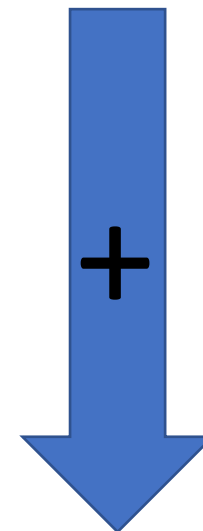
HW Victoria: 1905 UT  
tidal range: 2.4 m (neaps)

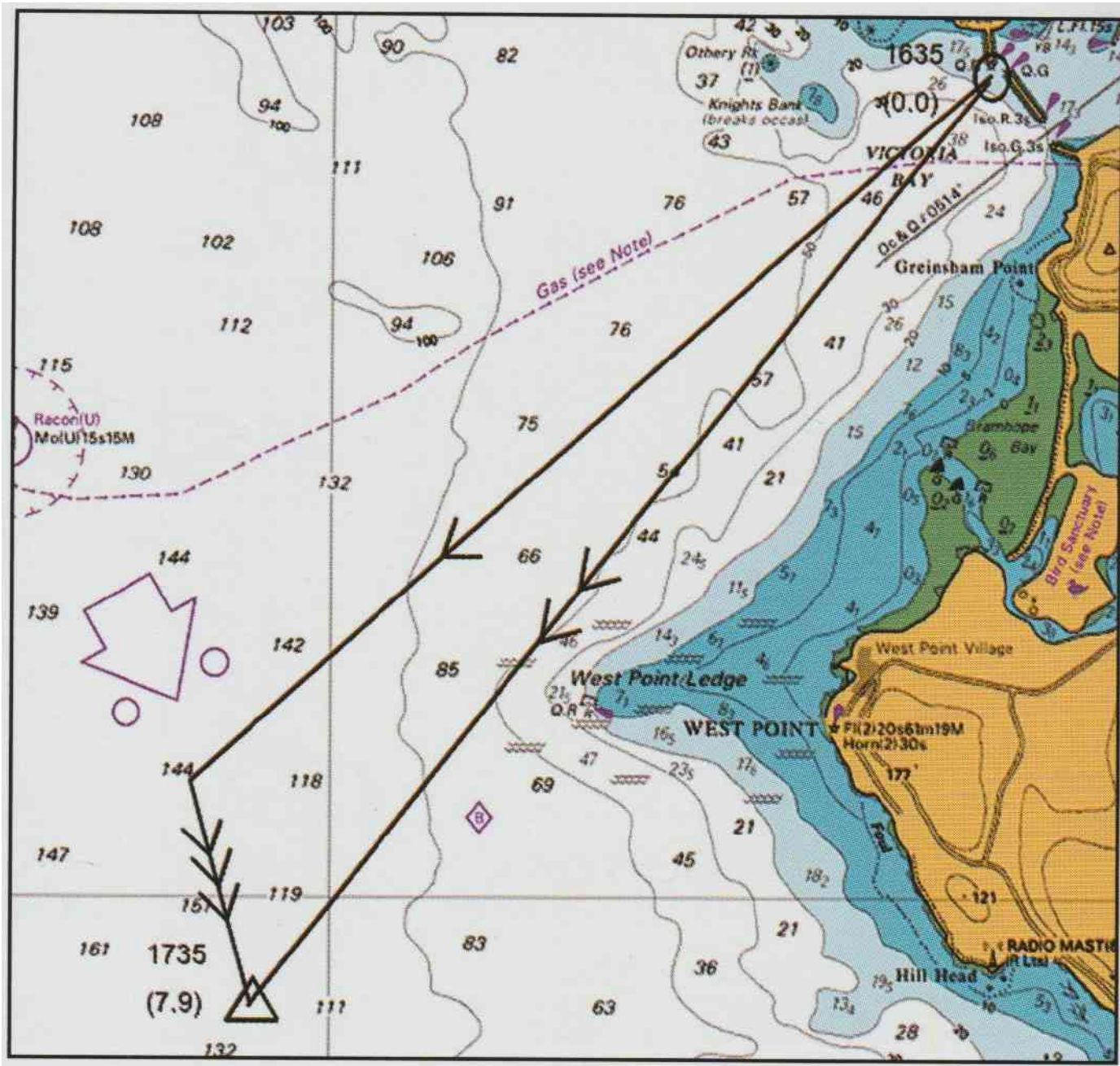
<div> <div>B</div> <div>46°20'6"N</div> <div>6 18 4W</div> </div>		
158	1.0	0.6
153	1.7	0.8
159	2.8	1.5
154	3.9	2.0
165	3.2	1.7
173	2.4	1.3
186	1.2	0.7
349	1.1	0.6
341	3.0	1.6
338	3.7	1.8
342	3.9	2.0
341	2.8	1.5
355	2.3	1.2



**stream:**  
**165°T**  
**1.7 kn**

MgK	235
+ Abl	0
mwK	235
+ Mw	-7
RwK	228
+ BW	0
KdW	228





PE à 1735 UT:  
46°19'.20N  
006°20'.85W

à 0.6 NM

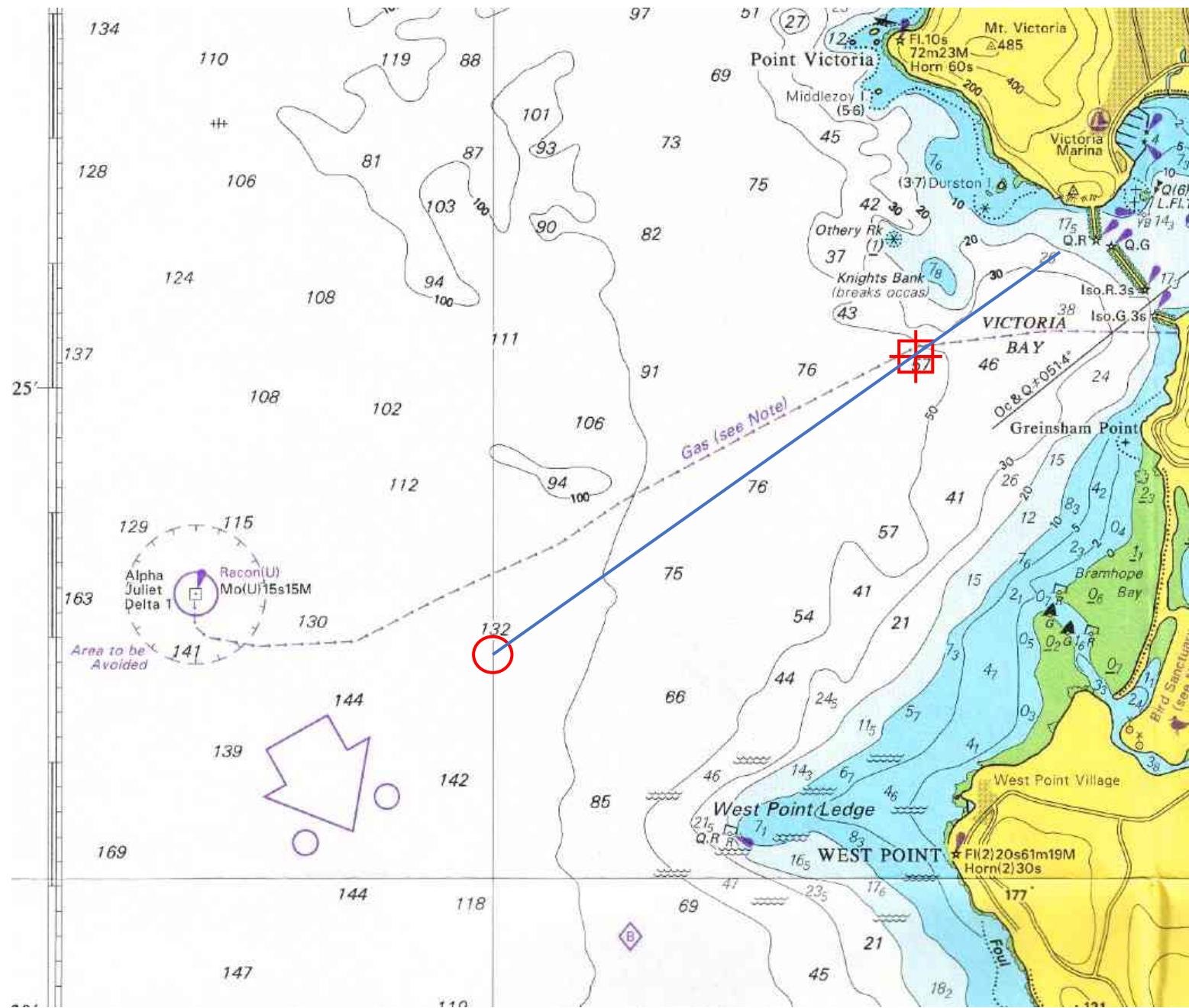
# Course to steer?



# Exercise

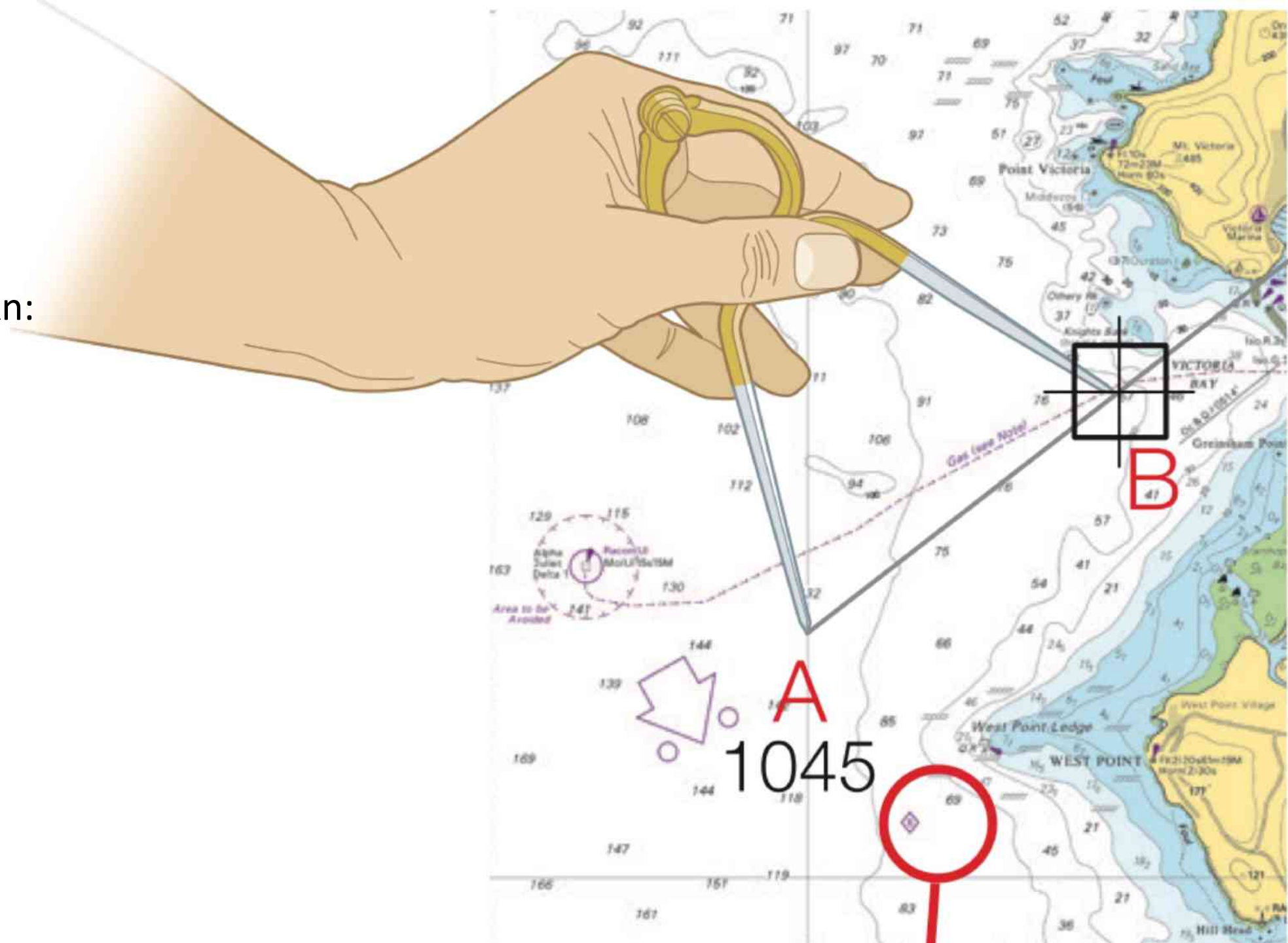
- 24<sup>th</sup> of May
- at 1045 DST





Distance to  
navigate:  
8.5 NM

Time taken at 9 kn:  
 $\pm 1$  heure



Victoria

B

HW 0916  
+1 1016  
+2 1116  
+3 1213

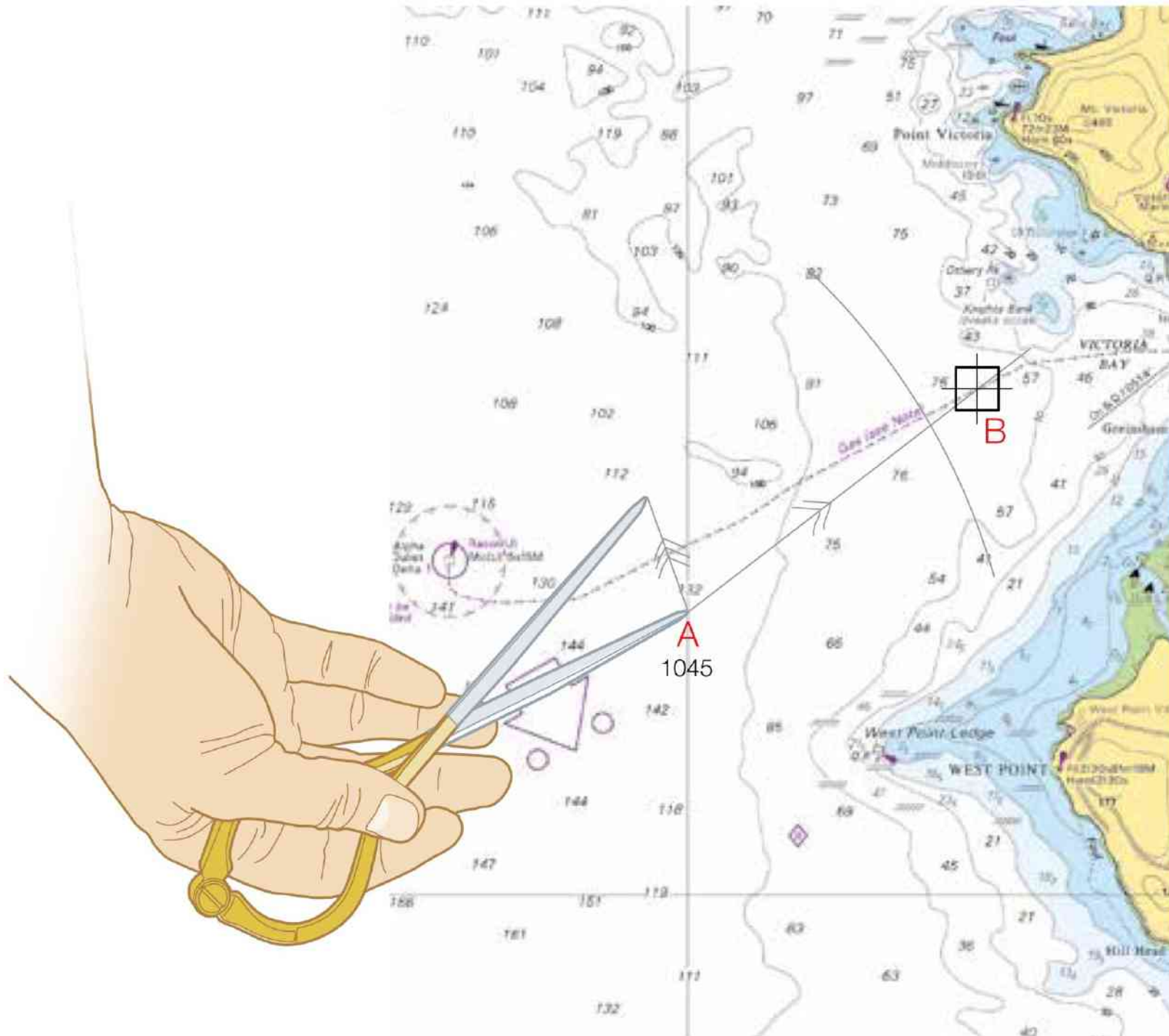
0946  
1046  
1146  
1246

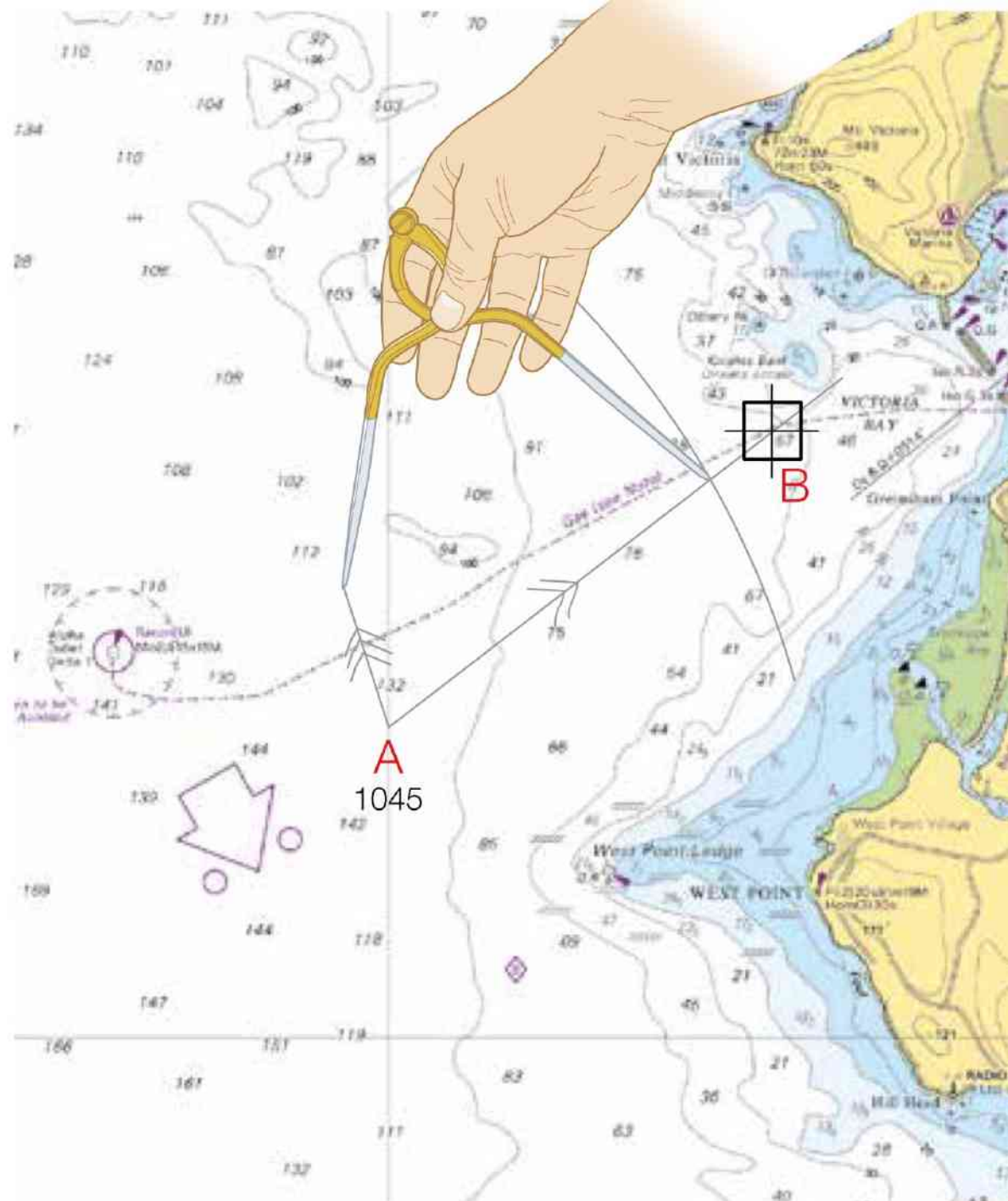
1045-1145  
= HW +2

Answer 341°(T) 3.0kn

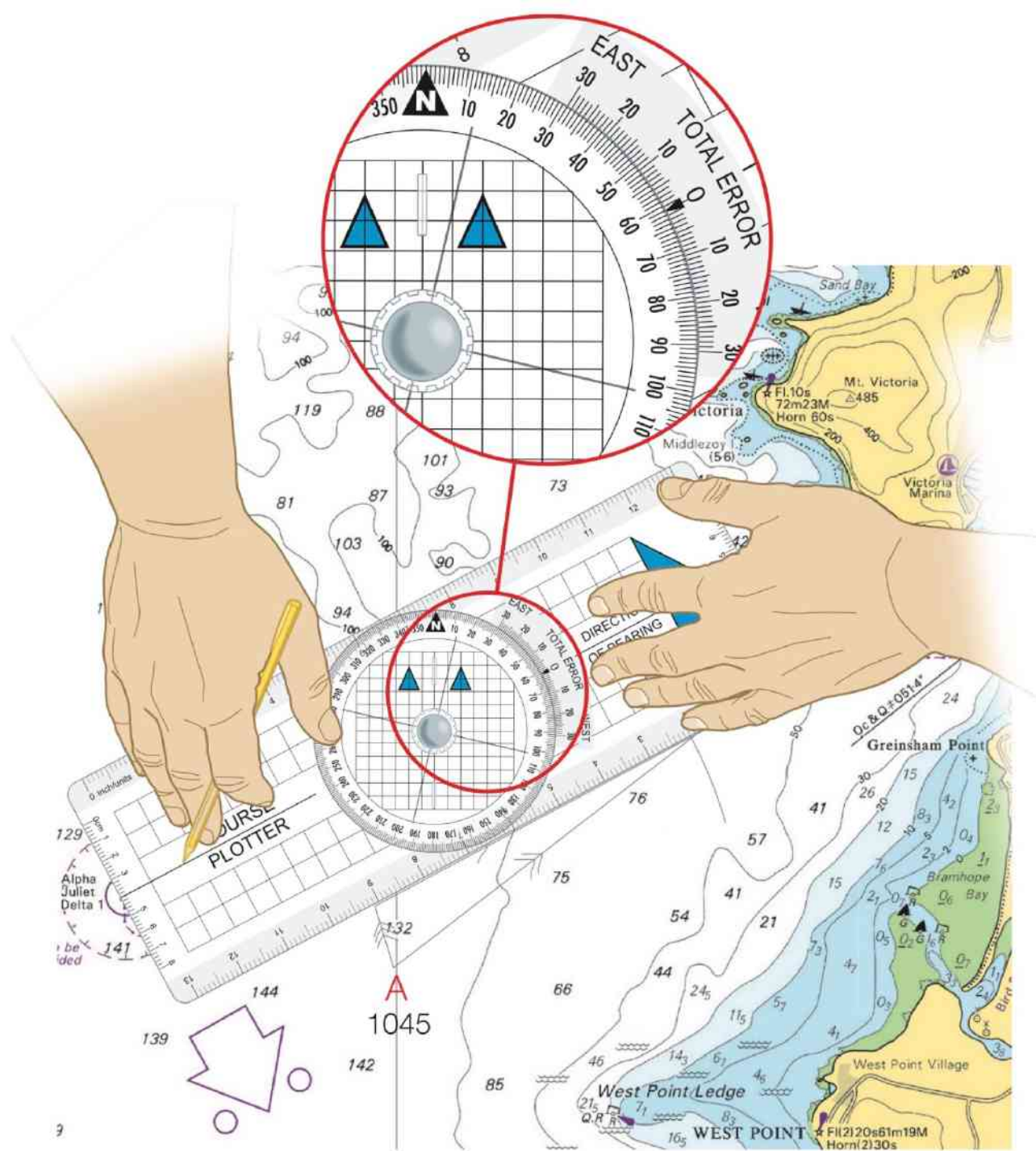
Hours	B	46°20'6 N 6 18.4W
Before High Water	6	158
	5	153
	4	159
	3	154
	2	165
	1	173
High Water		186
After High Water	1	349
	2	341
	3	338
	4	342
	5	341
	6	355





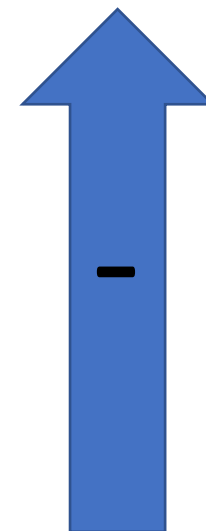


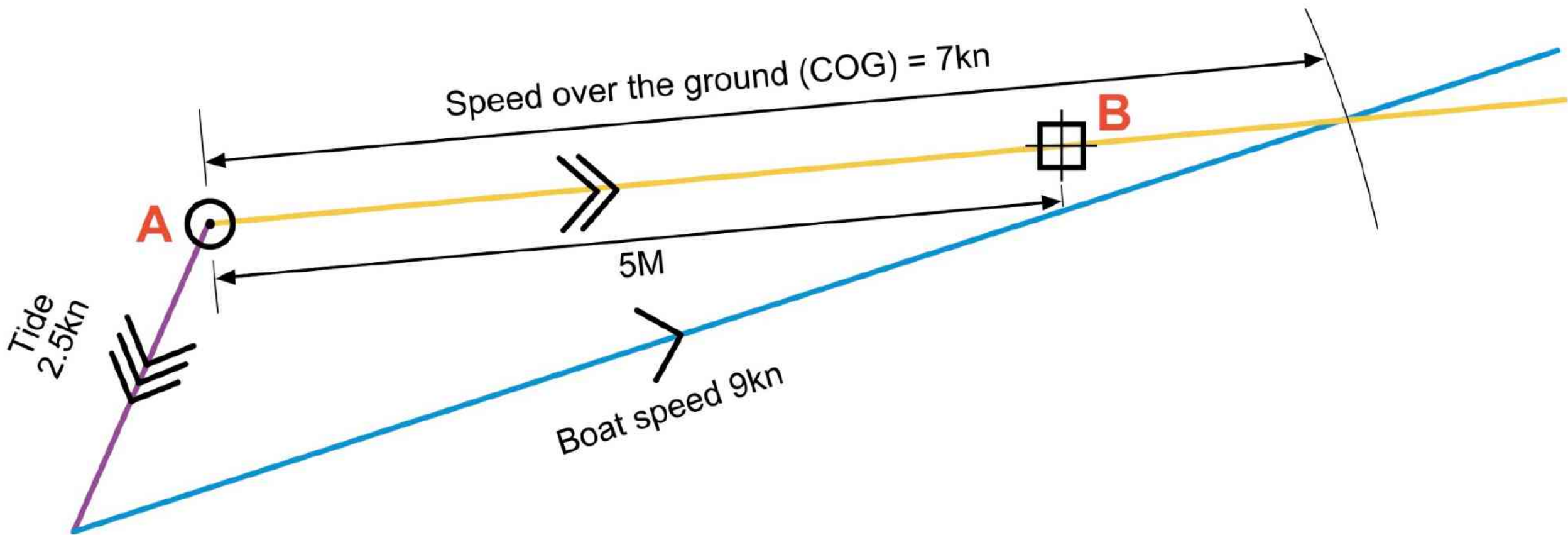




61°T

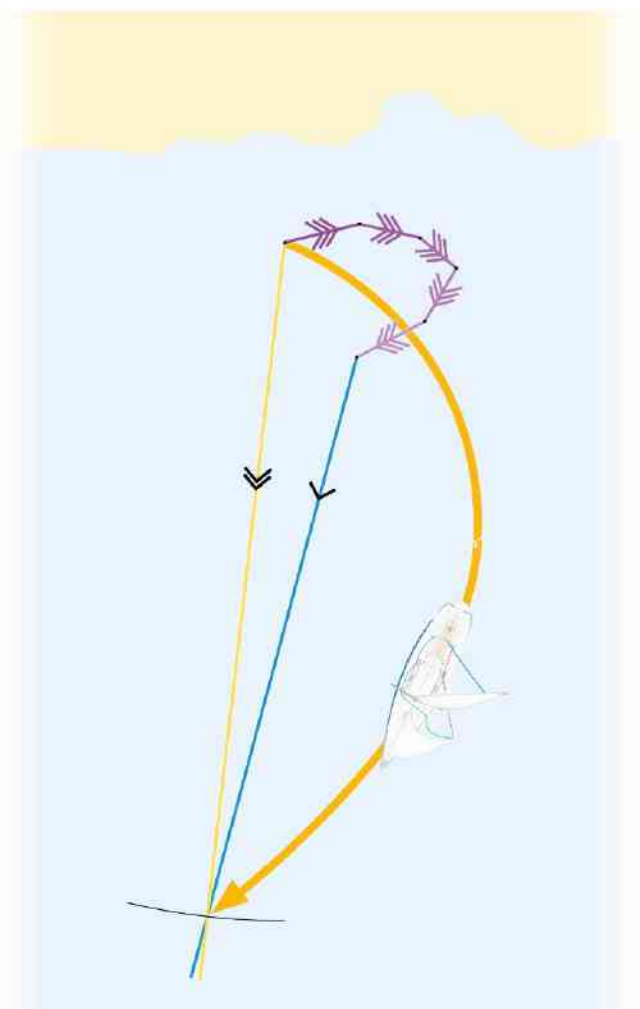
MgK	66
+ Abl	+2
MwK	68
+ Mw	-7
RwK	61
+ BW	0
KdW	61

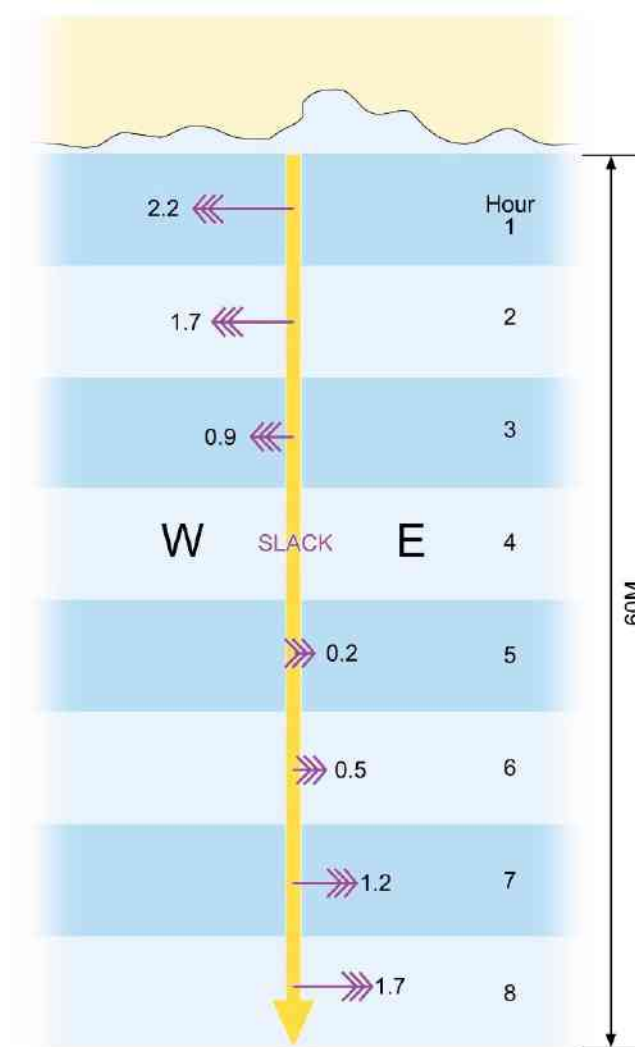






You must work out a tidal vector for each hour of passage.





$$\begin{aligned}
 \text{West - East} &= \\
 &2.2 + 1.7 + 0.9 \\
 &- 0.2 - 0.5 - 1.2 - 1.7 \\
 &= 1.2W
 \end{aligned}$$

