Week 4

Position 2

1

Estimated Position (EP)

2

Plotting an EP

We need to know:

- Departure Point
- Water track (i.e. Course steered corrected for leeway)
- Distance sailed through the water
- Set and drift of the tide

for the period concerned

AXE YACHT CLUB

3

Example

Taken from a yacht's log:

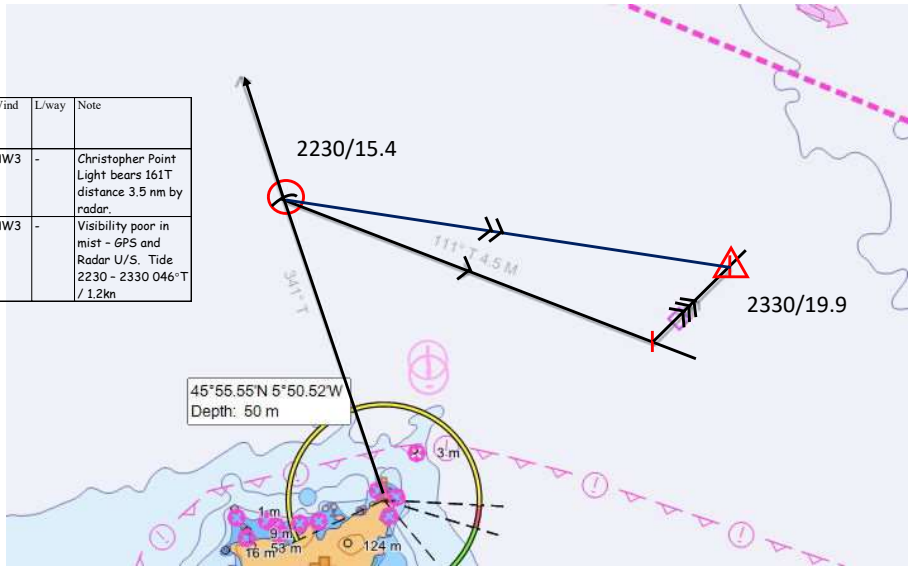
Time	Log	Co	Wind	L/way	Note
2230	15.4	111T	NW3	-	Christopher Point Light bears 161T distance 3.5 nm by radar.
2330	19.9	111T	NW3	-	Visibility poor in mist – GPS and Radar U/S. Tide 2230 – 2330 046°T / 1.2kn

Estimate the yacht's position at 2330.

AXE YACHT CLUB

4

Time	Log	Co	Wind	L/way	Note
2230	15.4	111T	NW3	-	Christopher Point Light bears 161T distance 3.5 nm by radar.
2330	19.9	111T	NW3	-	Visibility poor in mist - GPS and Radar U/S. Tide 2230 - 2330 046°T / 1.2kn



5

PLOTTING SYMBOLS

DR (Dead reckoning) — 1600

EP (Estimated position) — 1945

Fix (Observed position) — 2006 OR 2117

Position line

Transferred position line

Range / Distance off

Depth contour line — 20

Water track

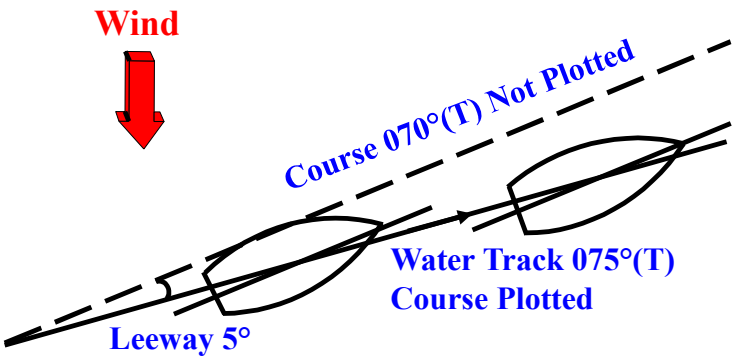
Ground track

Tidal stream

AXE YACHT CLUB

6

LEEWAY

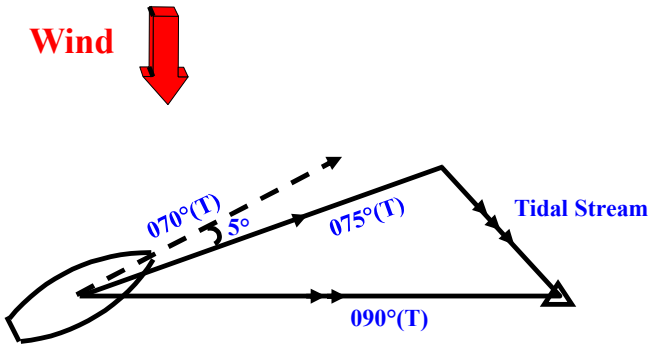


Water Track = Heading + or - LEEWAY

AXE YACHT CLUB

7

ESTIMATED POSITION WITH LEEWAY



AXE YACHT CLUB

8

Fix by Transferred Position Line

The running fix

9

Information required

- Bearing to a fixed point, time bearing taken and log reading.
- A second bearing to the fixed point taken after a suitable time interval. Ideally, this bearing should be 40 to 50 degrees different from the first bearing.
- The time of taking this second bearing and the log reading at that time are recorded.
- The course steered between taking the two bearings.
- The tidal set and drift for the period between taking the two bearings.

10

Process

- Lay off a position line on the first bearing of the fixed object.
- From any point on this line, construct an EP using the water track, distance run and tidal information.
- Transfer the first bearing to give a transferred position line through this EP.
- Lay off the second bearing of the fixed object.
- The intersection of this second line with the transferred position line gives the "fix" at the time the second bearing was taken.

11

Running Fix Example

Taken from a yacht's log

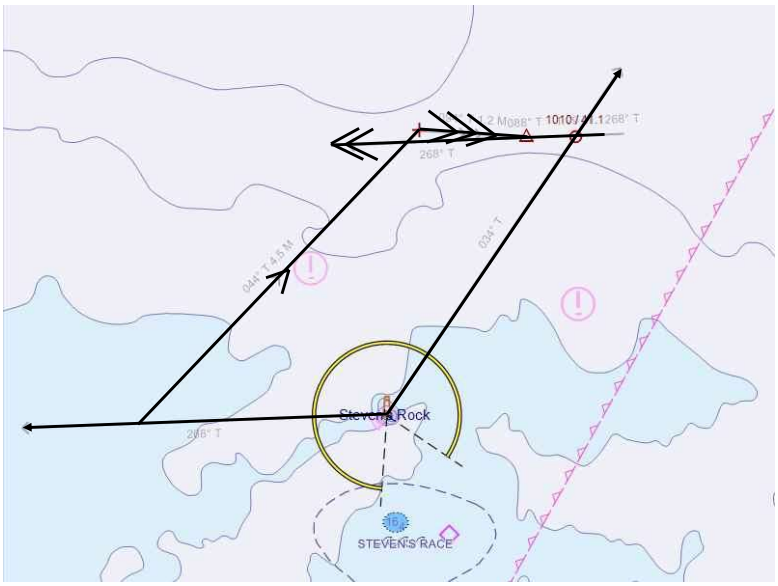
Time	Log	Course	Wind	L/W	Notes
0910	36.6	044T	W3	0	Steven's Rk Lt bears 088T
1010	41.1	044T	W2	0	Steven's Rk Lt now bears 214T

Tidal stream 0910 to 1010 – 094T / 1.2kn

Find the yacht's position at 1010.

12

The Chartwork



13

Break

14

Fixing Position by Rising and Dipping Distances

AXE YACHT CLUB

15

The Lighthouse

From the chart we can get:

Position of light

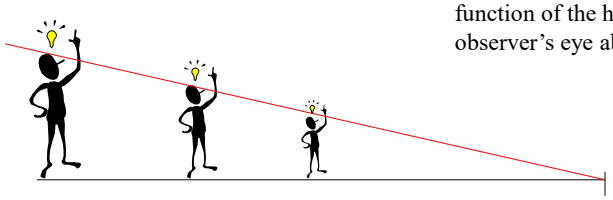
Height of light above MHWS

Characteristic of light

AXE YACHT CLUB

16

The Geometry 1

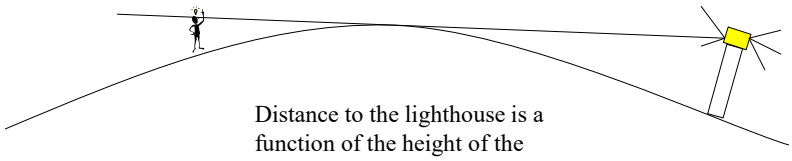


Distance to the horizon is a function of the height of the observer's eye above sea level

Horizon

17

The Geometry 2



Distance to the lighthouse is a function of the height of the lighthouse and the height of eye of the observer.

18

Rising and Dipping Tables

Lights - distance off in Miles when rising or dipping

Height of light		Height of eye									
metres	1	2	3	4	5	6	7	8	9	10
metres	feet	feet	3	7	10	13	16	20	23	26	30	33
10	33		8·7	9·5	10·2	10·8	11·3	11·7	12·1	12·5	12·8	13·2
12	39		9·3	10·1	10·8	11·4	11·9	12·3	12·7	13·1	13·4	13·8
14	46		9·9	10·7	11·4	12·0	12·5	12·9	13·3	13·7	14·0	14·4
16	53		10·4	11·2	11·9	12·5	13·0	13·4	13·8	14·2	14·5	14·9
18	59		10·9	11·7	12·4	13·0	13·5	13·9	14·3	14·7	15·0	15·4
20	66		11·4	12·2	12·9	13·5	14·0	14·4	14·8	15·2	15·5	15·9
22	72		11·9	12·7	13·4	14·0	14·5	14·9	15·3	15·7	16·0	16·4
24	79		12·3	13·1	13·8	14·4	14·9	15·3	15·7	16·1	16·4	17·0
26	85		12·7	13·5	14·2	14·8	15·3	15·7	16·1	16·5	16·8	17·2
28	92		13·1	13·9	14·6	15·2	15·7	16·1	16·5	16·9	17·2	17·6
30	98		13·5	14·3	15·0	15·6	16·1	16·5	16·9	17·3	17·6	18·0
32	105		13·9	14·7	15·4	16·0	16·5	16·9	17·3	17·7	18·0	18·4
34	112		14·2	15·0	15·7	16·3	16·8	17·2	17·6	18·0	18·3	18·7
36	118		14·6	15·4	16·1	16·7	17·2	17·6	18·0	18·4	18·7	19·1
38	125		14·9	15·7	16·4	17·0	17·5	17·9	18·3	18·7	19·0	19·4
40	131		15·3	16·1	16·8	17·4	17·9	18·3	18·7	19·1	19·4	19·8
42	138		15·6	16·4	17·1	17·7	18·2	18·6	19·0	19·4	19·7	20·1
44	144		15·9	16·7	17·4	18·0	18·5	18·9	19·3	19·7	20·0	20·4
46	151		16·2	17·0	17·7	18·3	18·8	19·2	19·6	20·0	20·3	20·7
48	157		16·5	17·3	18·0	18·6	19·1	19·5	19·9	20·3	20·6	21·0
50	164		16·8	17·6	18·3	18·9	19·4	19·8	20·2	20·6	20·9	21·3
55	180		17·5	18·3	19·0	19·6	20·1	20·5	20·9	21·3	21·6	22·0
60	197		18·2	19·0	19·7	20·3	20·8	21·2	21·6	22·0	22·3	22·7
65	213		18·9	19·7	20·4	21·0	21·5	21·9	22·3	22·7	23·0	23·4
70	230		19·5	20·3	21·0	21·6	22·1	22·5	22·9	23·2	23·6	24·0
75	246		20·1	20·9	21·6	22·2	22·7	23·1	23·5	23·9	24·2	24·6
80	262		20·7	21·5	22·2	22·8	23·3	23·7	24·1	24·5	24·8	25·2
85	279		21·3	22·1	22·8	23·4	23·9	24·3	24·7	25·1	25·4	25·8
90	295		21·8	22·6	23·3	23·9	24·4	24·8	25·2	25·6	25·9	26·3
95	312		22·4	23·2	23·9	24·5	25·0	25·4	25·8	26·2	26·5	26·9
metres	feet	metres	1	2	3	4	5	6	7	8	9	10
Height of light		feet	3	7	10	13	16	20	23	26	30	33
							Height of eye					

AXE YACHT CLUB

19

Obtaining a fix (rising)

- Identify light on chart
- You will be able to see the loom of the light above the horizon.
- Note the time at which the light itself becomes visible.
- Take a bearing of the light.
- Note the log reading.

AXE YACHT CLUB

20

Finding the Distance Off

- Adjust the height of the light for the height of tide.
- Enter the table at the height of the light.
- Move across to the relevant height of eye column.
- Read “distance off”.

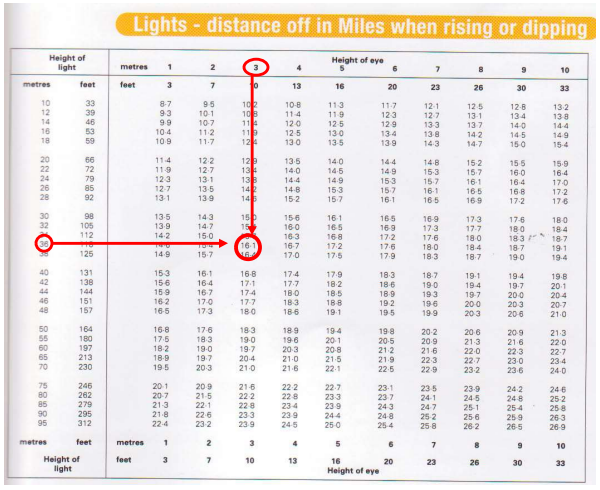
Example

Height of eye = 3m

Corrected height of light = 36m

Distance off = ?

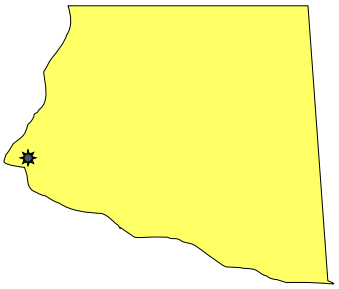
16.1 nm

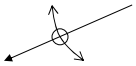


Lights - distance off in Miles when rising or dipping

Height of light		Height of eye									
metres	1	2	3	4	5	6	7	8	9	10
metres	feet	feet	3	7	10	13	16	20	23	26	30	33
10	33		8·7	9·5	10·2	10·8	11·3	11·7	12·1	12·5	12·8	13·2
12	39		9·3	10·1	10·8	11·4	11·9	12·3	12·7	13·1	13·4	13·8
14	46		9·9	10·7	11·4	12·0	12·5	12·9	13·3	13·7	14·0	14·4
16	53		10·4	11·2	11·9	12·5	13·0	13·4	13·8	14·2	14·5	14·9
18	59		10·9	11·7	12·4	13·0	13·5	13·9	14·3	14·7	15·0	15·4
20	66		11·4	12·2	12·9	13·5	14·0	14·4	14·8	15·2	15·5	15·9
22	72		11·9	12·7	13·4	14·0	14·5	14·9	15·3	15·7	16·0	16·4
24	79		12·3	13·1	13·8	14·4	14·9	15·3	15·7	16·1	16·4	17·0
26	85		12·7	13·5	14·2	14·8	15·3	15·7	16·1	16·5	16·8	17·2
28	92		13·1	13·9	14·6	15·2	15·7	16·1	16·5	16·9	17·2	17·6
30	98		13·5	14·3	15·0	15·6	16·1	16·5	16·9	17·3	17·6	18·0
32	105		13·9	14·7	15·4	16·0	16·5	16·9	17·3	17·7	18·0	18·4
34	112		14·2	15·0	15·7	16·3	16·8	17·2	17·6	18·0	18·3	18·7
36	118		14·6	15·4	16·1	16·7	17·2	17·6	18·0	18·4	18·7	19·1
38	125		14·9	15·7	16·4	17·0	17·5	17·9	18·3	18·7	19·0	19·4
40	131		15·3	16·1	16·8	17·4	17·9	18·3	18·7	19·1	19·4	19·8
42	138		15·6	16·4	17·1	17·7	18·2	18·6	19·0	19·4	19·7	20·1
44	144		15·9	16·7	17·4	18·0	18·5	18·9	19·3	19·7	20·0	20·4
46	151		16·2	17·0	17·7	18·3	18·8	19·2	19·6	20·0	20·3	20·7
48	157		16·5	17·3	18·0	18·6	19·1	19·5	19·9	20·3	20·6	21·0
50	164		16·8	17·6	18·3	18·9	19·4	19·8	20·2	20·6	20·9	21·3
55	180		17·5	18·3	19·0	19·6	20·1	20·5	20·9	21·3	21·6	22·0
60	197		18·2	19·0	19·7	20·3	20·8	21·2	21·6	22·0	22·3	22·7
65	213		18·9	19·7	20·4	21·0	21·5	21·9	22·3	22·7	23·0	23·4
70	230		19·5	20·3	21·0	21·6	22·1	22·5	22·9	23·2	23·6	24·0
75	246		20·1	20·9	21·6	22·2	22·7	23·1	23·5	23·9	24·2	24·6
80	262		20·7	21·5	22·2	22·8	23·3	23·7	24·1	24·5	24·8	25·2
85	279		21·3	22·1	22·8	23·4	23·9	24·3	24·7	25·1	25·4	25·8
90	295		21·8	22·6	23·3	23·9	24·4	24·8	25·2	25·6	25·9	26·3
95	312		22·4	23·2	23·9	24·5	25·0	25·4	25·8	26·2	26·5	26·9
metres	feet	metres	1	2	3	4	5	6	7	8	9	10
Height of light		feet	3	7	10	13	16 Height of eye	20	23	26	30	33

Plotting





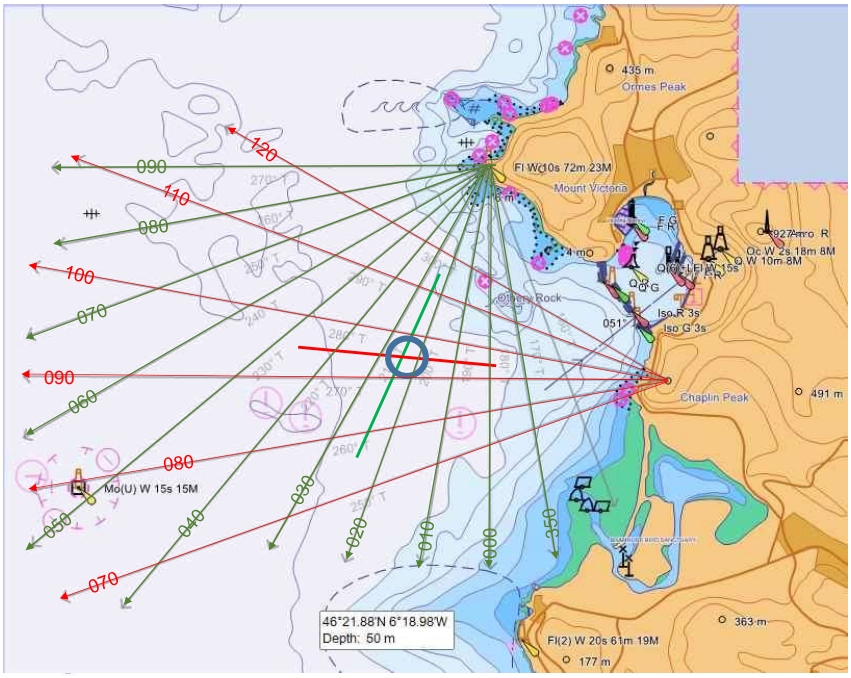
2215 / 54.2

AXE YACHT CLUB

23

Bearing Grids

24



Point Victoria Lt bears 025T

Chaplin Peak bears 095T

25