

# **USING TIDAL CURVES**

### **AIR DRAFT**

How to work out if you have enough air draft to pass under bridges/power lines, etc

This presentation deals with how you can to work out when it is safe to pass under bridges and power lines which at high water are lower than your mast

# You Will Need

### **RYA Almanac**



### **RYA Chartplotter**



### Pad of paper, pencil and rubber



### Pad of Graph Paper





- At 15.30 DST on July 9<sup>th</sup> you are approaching the road bridge over the FARLOW RIVER.
- Your yacht has an AIR DRAFT of 14.5m
- What clearance will there be between the top of the mast and the bridge?

### Find FARLOW RIVER in the RYA ALMANAC (page 61)

	6:0	0	> 10	
	FARLOW	River -	DI FARE	wes
2	STANDARD	Poet -	NAMLEY !	HARBOR
8	TIMES			
0	HW	Ly	)	
	0000 06	0000 00	0600	
	1200 180	00 1200	1800	
	- 0040 -0	- 0010	-0020	
		0010		
2	HEAHTS			
63	MHWS	MHWN	MLWN	MLWS
	4.0	3.4	(-1	0.4
	+0.7	+0.3	+0-7	+0-2
		(TRA)		
		L		l ook for a
		-	The second s	

dmark from some distance	
er is conspicuous on the Point.	
of Tom. Visitors benns are in	
HTS There is no tidal stream	
ver the River Rampton feeds	
na near the visitors berths.	
effect of the river when in	
some berthing difficulties.	
on VHF for present conditions.	
ach to the marina is 5.1m. The	
.0m.	
interest of	
marina is unlit and a night entry	
out local knowledge. There is a	
Rampton Point.	

VHF Ch 80 (1000-1700)-H, ME, EL, R.

DESCRIPTION. Farlow Riv of mountains. The Twins to Mt. Golding to the S. The the two quays. The entran	s bet Dr vci	
APPROACH WAYPOINT. PILOTAGE NOTES. If app		

1N 005"36".65W

Northern Territories CHART RYA 3.

Standard Port NAMLEY HARBOUR (+)

 High Water
 Low Water
 MH/VS
 MH/VS
 ML/VV
 ML/VV
 ML/VS
 ML/VS

Differences FARLOW -0040 -0018 -0010 -0020 +0.7 +0.3 +0.7 +0.2

Height (metres)

ent.shelter at

TIDAL STREAMS AND HEIGHTS. The stream runs up to 2.5kn in the main Farlow Channel, reducing to approx half of these rates in the shallows of Farlow Bay. The main effect within the river itself is that of the outgoing river current which, given the average rainfall, will be running past the quays at 0.5kn. The river has a minimum depth of 1.9m up to the lower Town Quay and 1.2m to the Upper Town Quay

Farlow River

LIGHTS AND MARKS. The major Lt Ho at Misery Pt IFI.10s34m25MI /B & W hor bands. O twill is 2.5M to the S of the river entrance. The entrance can be difficult to locate from offshore but is situated between the Twins (conspic Mts. to the N) and Mount Drew to the S. There is a conspicuous chapel on Farlow Point and Mon on South Point. There is an unit PHM on the N shore opposite the monument

VHF RADIO. None.

FACILITIES. FW, D&P (cans), Gas, CH, R.

and write down the following information: **The STANDARD PORT** •

The differences for FARLOW RIVER •

### Find NAMLEY HARBOUR in the RYA ALMANAC (from page 52)

#### NAMLEY HARBOUR - Standard Port

46°25'.74N 005°46'.70W Northern Territories CHARTS RYA 3, 4.

NAMLEY

TIME

UT 1054-

HW

13

-

-

-

TUES 95 JULY

Standard Port NAMLEY HARBOUR (→)

Times				Height (metres)					
High Water		Low	Water	MHWS	MHWN	MUN	MUS		
0000	0600	0000	0600	4.0	3.4	1.1	0.4		
1200	1800	1200	1800						
Different	es ITCHE	NHAM							
+0020	+0010	-0005	0000	-0.2	-0.1	-0.1	-0.1		
Different	es EMSB	OURNE							
+0010	+0010	-0010	-0005	-0.3	-8.1		-0.1		

HARBOUR

HEGH

LW

O.7 M RANGE 3.0 M

Hw

3.7m

TDAL STREAMS AND HEIGHTS. Best entry/exit is HW -3 to HW +1 avoiding the confused seas caused by the strong ebb stream. To build spring tables, the bar becomes very unconflortable in onshore winds > F5 combined with the ebb stream. The bail is dredged to 1.5m below CD but this may vary by ±0.76m after heavy onahore gales.

LIGHTS AND MARKS. Namiley Bar Beacon [PK2R-10s14m2M] is a conspicuous red painted wooden sincuture. A weather station on the beacon www.namieymetan.co.nt gives access to the current washer conditions in the vicinity of the entrance. All channels within the harbour are well marked by day. Channel and Repenting Reach are utilit. Nutworth Channel and Repenting Reach are utilit.

VHF RADIO. Namley Harbour Radio and patrol vessels VHF Ch 14, 16. Marinas VHF Ch 80.

FACILITIES. Clockwise from W Warren Point. Namley Marina. 30 V. Access at all states of the tide wa



work out the range

![](_page_5_Figure_12.jpeg)

FARLON RIVER

-18

0600 0700 0200 0900

DIHORENKES

- 35

1000

- 29

1100

1200

-40

Next, you will need the graph paper to interpolate between the corrections. Firstly expand the HW data and then you can then read off the right correction for the HW time of 10.54 - in this case minus 36 minutes

HW UT 1054 -36 UT 1018	2	HW L 3.7m 0				
HW	1	HW L				
TIME		HEGH				
TUES QE	HARBOUR JULY					
+0.7	+0.3	+0-				
MHW5 4.0	MHWN 3.4	MLW 1-1		•		
	MHWS 4.0 +0.7 NAMLEY TUES QE TIME	MHWS MHWN 4.0 3.4 +0.7 +0.3 NAMLEY HARBOUR TUES 95 JULY TIME	MHWS MHWN MLW 4.0 3.4 (.) +0.7 +0.3 +0. NAMLEY HARBOUR TUES 95 JULY TIME HEQH	MHWS MHWN MLW 4.0 3.4 1.1 +0.7 +0.3 +0. NAMLEY HARBOUR TUES 95 JULY TIME HEIGH	MHWS MHWN MLW 4.0 3.4 1.1 +0.7 +0.3 +0. NAMLEY HARBOUR TUES 95 JULY TIME HEQH	MHWS MHWN MLW 4.0 3.4 (.1 +0.7 +0.3 +0. NAMLEY HARBOUR TUES 95 JULY TIME HEQH

![](_page_7_Picture_1.jpeg)

# Height of Tide

Now you can add the differences in heights for FARLOW RIVER. First find the tidal curve for NAMLEY HARBOUR (page57)

![](_page_8_Figure_2.jpeg)

For HW you can see that the height of tide for that day is approx. halfway between springs and neaps, therefore you need to add 0.5m to the HW height

![](_page_8_Figure_4.jpeg)

![](_page_8_Picture_5.jpeg)

For LW you can see that the height of tide is just slightly less than halfway between the two figures, therefore you need to add 0.4m to the LW height

![](_page_9_Figure_1.jpeg)

![](_page_10_Figure_1.jpeg)

SPRINGS OR NEAPS? Look at the MEAN RANGES and write them down and compare them to the range on the 9<sup>th</sup> July

		-		
$\square$	MEAN R	ANGES		
	Springs	3.6m	The Party	
	Neaps	2.3m		-
0.8	Springs occu after new an	ur two days Id full moon		NAM
0.7				LEY
0.6				E
0.5 2				ARB
Q.4				DUR
	+			1
0.3	A .			
0.2				a
		N		th
0.1				
				b

You can see the spring range is 3.6m and neap range is 2.3m. On 9<sup>th</sup> July the range is 3.0m, which is about half-way between the inner RED spring range line and the outer BLUE neap range line

### Now draw a line from the time to the tidal curve

![](_page_12_Figure_2.jpeg)

![](_page_13_Figure_1.jpeg)

![](_page_14_Figure_1.jpeg)

# Finding Bridge Clearance

You've just worked out that at 15.30 the height of tide is 1.7m Now look up the height of the bridge ABOVE HAT (page 61) This shows there is 14m clearance at HAT

![](_page_15_Figure_2.jpeg)

![](_page_15_Figure_3.jpeg)

### Next - you need to find the HAT figure for FARLOW RIVER You'll find this in the almanac on page 12 in the TIDAL LEVELS TABLE

# **Finding Bridge Clearance**

### First of all take away the height of tide at 15.30 from HAT at FARLOW RIVER

![](_page_16_Picture_2.jpeg)

RANGE 3.0 M

m

Next - add the height of the bridge (3.7m + 14.0m = 17.7m) and then finally take away your air draft (17.7m - 14.5m = 3.2m)

![](_page_16_Picture_4.jpeg)

So you will have 3.2m clearance at 15.30 which.....is enough to proceed

![](_page_17_Picture_0.jpeg)

1. Farlow River	9 <sup>th</sup> July <u>Time</u>
	HW
Namley Harbour	(UT) 10.54
difference	- <u>00.36</u>
Farlow River	(UT) 10.18
correction for DS	ST + 01.00
Farlow River	(DST) 11.18

	<u>Heigh</u>	<u>ts</u>
	HW	LW
	3.7m	0.7m
+	<u>0.5m</u>	+0.4m
	<b>4.2m</b>	1.1m

2.	HAT at Farlow River	5.4m
	Height of tide at 15.30	- <u>1.7m</u>
	Fall of tide from HAT	3.7m
	Charted height of bridge	+ <u>14.0m</u>
	Height of bridge at 15.30	17.7m
	Air draught	<u>- 14.5m</u>
	Clearance	3.2m

# **Top Tips**

## Practical Tips for On-board Use

![](_page_18_Picture_2.jpeg)

### TOP TIP

In practical situations you may not have time to use the 'graph paper method' to interpolate tidal differences . With practice and experience you will be able to quickly compute in your head reasonably accurate figures.

If in doubt make sure you give yourself a bigger for margin for error.

![](_page_19_Picture_0.jpeg)

### TOP TIP

In the real world I write down my tidal information in my **LOGBOOK** on the page that I intend to use during the passage. That way I always have the information to hand when I need to refer to it.

![](_page_19_Figure_3.jpeg)

TID	5							ALES - HO
TIME ZONE () For Summer Time a	IT) WAI	LES - HOLYHEA	D	Dates in amber are Dates in yellow are	SPRINGS NEAPS	IDRE (UT)	LAT	53º19'N LO
hour in non-shade	TIMES AND HER	GHTS OF HIGH AND L	OW WATERS		2012	e-baded areas	IMES AND	HEIGHTS OF THE
MAY Time m Tin	JUNE		ULY	AUGUST	P	TEVISER	ime m	Time m
1 0537 4.6 10 1827 4.6 10 1827 4.6	56 1.8 1 0045 1.5 16 1 16 1.5 1 0045 1.5 16 1 16 1.5 1 10 5.1 10 5.4	0202 1.8 1 0124 1.3 0810 4.7 1 0745 5.1 1419 3.6 50 1358 1.1 040 6.9 3155 5.1	16 0222 1.8 M 1634 1.7 M 1634 1.7	1 0916 0.8 W 1516 0.9	0319 12 0129 51 1526 13	16 111 0.5 1	0415 0.8 1046 5.5 1649 0.9 2299 1.7	16 0409 0.4 1021 3.9 TU 1624 0.5 2229 6.1
2 0024 1.8 W 1301 1.3 W 1301 1.3 W 1301 1.3 W 1301 1.3	10 1.7 <b>2</b> 0143 1.2 <b>17</b> 0 10 1.7 <b>2</b> 0143 1.2 <b>17</b> 0 10 1.7 <b>1 1 1 1 1 1 1 1 1 1</b>	2247         1.6         2 0225         1.0           3054         4.8         2 0845         5.3           1459         1.5         M 1453         0.9           1177         5.0         2108         5.3	17 0925 15 10 1514 15 2131 51	2 0404 0.6 1019 5.5 TH 1620 0.8 17 1620 0.8	2341 3.4 32 0954 1.0 11 1003 5.3 1 1601 1.0	17 555 54 18 557 55 1952 55	2 0506 0.9 1118 5.5 U 1722 1.0 2332 5.6	17 0450 0.4 1103 6.0 W 1708 0.5 2324 6.0
3 0122 1.4 0730 5.1 TH 1350 0.9 2012 5.2 21	H 15 15.0	H26 1.4 3 0321 0.8 H33 5.0 3 0939 5.5 533 1.4 TU 1545 0.8 H51 5.2 0 2118 5.7	18 0340 1.3 W 1550 1.3	3 044/ 05 7 1701 07 2112 58	1425 0.7 10 1037 5.4 1 1636 0.8 1	18 1514 0.4 1025 5.8 10 1727 0.5	3 0537 1.3 1149 5.4 W 1756 1.2	18 1147 5.9 TH 1755 0.6
4 0012 10 10020 555 11440 0.6 3026 55 3026 55 20	2 1.3 4 0129 0.6 19 0 9 5.1 4 0947 5.7 19 1 5 1.2 M 1555 0.6 TU 5 1 52 0 2289 5.8 2	403 1.3 4 0413 0.3 010 5.0 4 1030 5.5 609 1.3 W 1621 0.7 225 5.3 2246 5.9	19 0419 1.1 19 1038 5.2 TH 1625 1.1 • 2240 5.5	4 1521 0.5 54 1540 0.7 55 1540 0.7 2553 5.8	1504 0.6 113 5.6 712 0.7 127 5.4	19 1054 0.5 W 1010 0.6	4 0005 5.4 0605 13 TH 1222 5.3 1830 1.4	19 0012 5.9 0620 0.8 1225 5.8 1845 0.8
5 0913 5.7 5 0913 5.7 5 1325 6.4 2140 5.7 9 20 09 50 15 2140 5.7	112 5 1050 653 112 110 1644 0.6 2257 5.9 20 10 10 1644 0.6 2257 5.9	438 1.1 5 0501 0.4 045 5.1 5 1118 5.8 644 1.2 5H 1719 0.7 259 5.4 2331 5.5	20 0454 0.9 7 1700 1.0 2315 5.6	5 0607 0.6 51219 5.4 50 1819 0.9 20 1	540 83 150 56 750 87	20 0027 5.8 0037 0.7	5 0040 5.2 0643 1.5 7 1255 5.1	20 0105 55 0112 1.1 54 1337 55 1941 1.1
6 1001 59 21 50 50 1611 0.1 0 2224 59 4 16 0 2224 59	1 1.1 5.2 0 1.2 5.3 6 0511 0.4 1129 5.6 W 1793 0.6 2346 5.9 21 02 1110 1129 5.6 21 02 1129 5.6 21 02 21 0 21 0 21 21 0 21 0 2	513 1.1 121 5.1 6 0548 0.4 129 1.2 F 1803 0.8 134 1.4 F 1803 0.8	21 0528 0.8 54 1736 0.9 2352 5.6	6 0644 0.8 21 0 M 1257 52 TU 1	006 5.8 518 0.6 231 5.5 100 0.8	21 0115 5.6 1 21 0115 5.6 1 1341 5.4	6 0117 49 54 1333 43	21 0203 5.7 00 1427 5.3 200 1427 1.4
7 1649 5.9 22 11 M 1657 0.4 TU 17 2311 5.9 231	111 52 52 53 70462 0.4 71220 5.5 719 1821 0.8 719 1821 0.8	100 1.0 158 5.1 156 1.2 166 1.2 1847 0.9	22 0006 0.8 1215 5.3 50 1814 0.9	7 0110 5.4 01722 1.1 TU 1334 5.0 1936 1.4	13 54 14 05	1151 1.2 122 0210 5.2 12 022 0210 5.2 15 15 15 14 14 19 5.1	7 0200 41	22 (1115 4.8 (1122 1.9 M 1540 5.0 (2208 1.8
8 1119 5.9 1119 5.9 10 1745 0.5 2358 5.8 235	8 0005 3.8 23 00 5 121 8 10 10 5 121 10 1010 10	112 5.4 8 0001 5.7 27 1.0 0717 0.8 37 5.1 50 1332 5.1 04 1.2 1931 1.2	23 0010 5.6 0644 0.8 M 1255 5.3 1853 1.0	8 0148 52 23 07 W 1412 48 2419 17	12 55 46 10 00 52 05 12	4 23 0120 48 0 11555 48	8 0255 4 0901 2 M 1522 4	23 10412 47 10 1702 49 10 1702 49
9 1220 5.8 24 121 W 1825 0.8 TH 181	13 54 1407 54 50 50 13 13 54 1407 54 50 50 13 2002 13	51 53 9 0545 5.4 07 1.1 9 0602 1.1 18 5.0 M 1418 4.9 16 13 2017 1.4	24 0110 5.5 0725 0.8 TU 1838 5.2 1937 1.1	9 0229 49 24 02 TH 1457 45 7 14 0 2109 20 0 25	23 5.2 10 K 0 28 5.0 15	12 2236 1.7 14 24 0453 46 1101 2.0	9 0415 4 9 1017 7 TU 1648	24 1155 20 W 1818 5.0
10 0195 0.5 25 000 19 1325 5.3 1925 1927 1.1 155	12 10 0216 5.3 25 000 12 SU 0858 5.1 25 000 50 0858 5.1 M 140 2056 1.6 250	11 5.3 50 1.1 51 4.9 52 1.4 53 4.9 50 1.532 4.7 535 4.7 50 1.532 4.7 51 10 1532 4.7 51 10 1532 4.7	25 0154 5.4 W 1425 5.0 2027 1.3	10 0319 4.6 25 02 0 0936 2.0 25 02 1 1555 4.4 2.2 54 160 2214 2.2 54 22	7 4.9 11 11 11 11 11 11 11 11 11 11 11 11 11	14 2348 1.7 12 25 0625 4.7 12 25 0625 4.7 14 15 15	10 0545 W 1829	13 25 00 M2 16 24 Th 1306 18 1820 52
1 10802 0.9 26 010 7 3424 5.0 34 133 2025 1.4 192	11 0945 14 26 001 4.8 M 1557 4.6 TU 145 0 2157 1.8 205	8 52 <b>11</b> 0318 48 19 12 <b>12</b> 0939 13 3 48 W 1557 45 4 15 0 2205 20	26 0348 5.2 114 1520 4.9	1 6425 4.3 26 041 1 1043 2.3 26 111 14 1711 4.3 30 171	12 4.7 2 1.8 10 5 4.7 %	26 0104 15	11 0001	20 26 0001 51 11 26 0001 51

28 000

### **TOP TIP**

As almanacs are one hit wonders, ie, you buy a new one each year, I always circle the range of dates I am using. This is so I don't get confused and copy the wrong data and it makes checking much easier and quicker.

# Top Tips

### TOP TIP

Ž

I don't use a full almanac and prefer the **PBO Cruising Almanac**.....it's more compact, better value for money and has all the information I need.

![](_page_20_Picture_3.jpeg)

### TOP TIP

Almanacs have load of pages of similar looking information. To make it easy to find tide times of ports I often use, I make tabs out of stickers. This way I can find the information I need quickly when I need to refer to it.

This website helps support us and our families. If you found this document useful please consider donating £3.50 to the running of this website.

**CLICK HERE TO DONATE £3.50** 

Thank you for your honesty.

## **Further Reading**

![](_page_21_Picture_4.jpeg)

We highly recommend Tim Bartlett's **RYA Navigation Handbook (G6)** 

You can buy a copy of this book by visiting our on-line shop