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# ADMIRALTY TIDE TABLES

VOLUMES 1, 2 & 3

# 1992

# INDEX TO STANDARD PORTS






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# ADMIRALTY

# TIDE TABLES

## VOLUME 1

## 1992

## EUROPEAN WATERS

### INCLUDING MEDITERRANEAN SEA

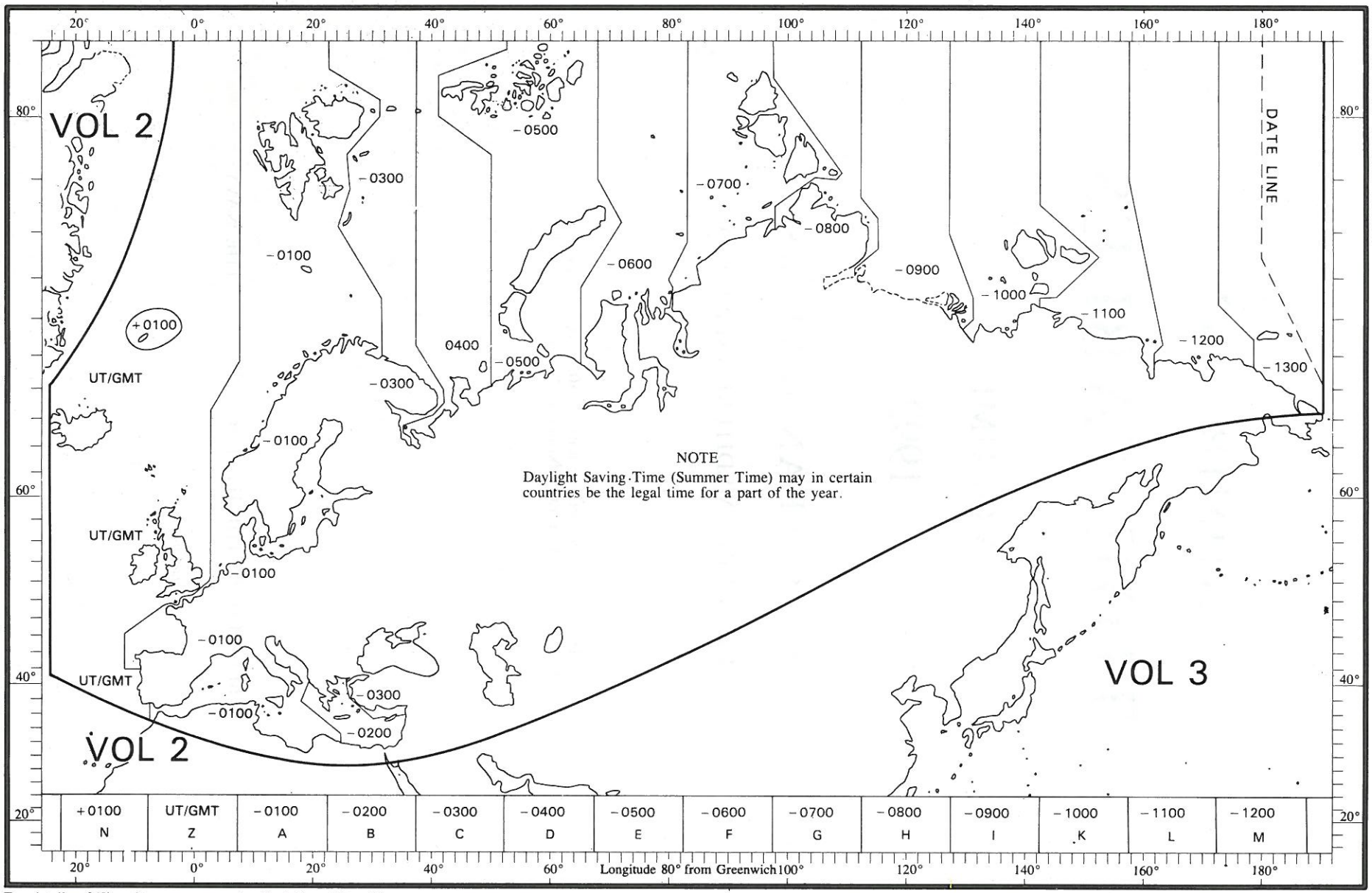
Important Corrections notified after going to press
will be found in Admiralty Notice to Mariners No. 1 of 1992



PUBLISHED BY THE HYDROGRAPHER OF THE NAVY

*To be obtained from the Agents for the sale of Admiralty Charts*

1991




For details of Time Zones see page ix, Part II and Part III.

# PREFACE

Admiralty Tide Tables are published annually in three volumes as follows:

VOLUME 1: EUROPEAN WATERS (including the Mediterranean Sea)

VOLUME 2: THE ATLANTIC AND INDIAN OCEANS (including tidal stream predictions)

VOLUME 3: THE PACIFIC OCEAN AND ADJACENT SEAS (including tidal stream predictions)

## Vol. 1: General arrangement

Part I of these tables gives daily predictions of the times and heights of high and low waters at a selected number of Standard Ports. The list of Standard Ports is given inside the front cover. Included with each set of predictions for Standard Ports (with the exception of Venezia) is a diagram to facilitate the calculation of heights at times other than high and low water. An explanation of the use of these diagrams is given in the Instructions for the use of the Tables (page xii).

The introduction to Part I deals with a number of subjects of general interest, in particular the effect of meteorological conditions on tidal heights; following the introduction are a number of special tables and diagrams for use with the tide tables.

Part II gives data for prediction at a large number of Secondary Ports; this is in the form of time and height differences, referred to one of the Standard Ports in Part I. Part III gives the harmonic constants for use with the Simplified Harmonic Method of Tidal Prediction (N.P.159). In those cases where harmonic constants are given two alternative methods of prediction are available.

## Source of tidal predictions

Predictions for some Standard Ports in the British Isles and elsewhere are computed on behalf of the harbour authorities by the Proudman Oceanographic Laboratory, Bidston; others are prepared by the Hydrographer of the Navy.

Predictions for the remaining Standard Ports are received from the appropriate authorities in Denmark, France, Germany, Netherlands and Norway.

Data in Part II for places outside the British Isles are, in general, extracted from the tide tables published by the appropriate national authority.

A list of the authorities responsible for the observations, analyses and predictions at Standard Ports is given in Table V (page xxxviii).

## Special Predictions for Secondary Ports

The Hydrographic Office can supply daily predictions for Secondary Ports, either as times and heights of high and low waters or as hourly heights, upon request.

## Times used for predictions in Vol. 1

**ALL TIMES OF PREDICTIONS IN PART I ARE GIVEN IN THE STANDARD TIME KEPT AT THE PLACE. IN THE BRITISH ISLES THE TIME USED IS UNIVERSAL TIME (G.M.T.).** The Zone Time used for this purpose is shown on every page of Part I and Part II of the tables (see page ix).

When British Summer Time is being kept, one hour should be *added* to the predicted times. It is believed that B.S.T. will be kept between 29th March and 24th October, 1992 but these dates are provisional and subject to confirmation.

## Heights of predictions

**ALL PREDICTED HEIGHTS IN PART I ARE GIVEN IN METRES** above Chart Datum. The height differences in Part II are also given in metres and, when applied to heights at Standard Ports, will give heights referred to Chart Datum at the *Secondary Port*.

Chart Datum is understood to be the datum of soundings on the latest edition of the largest scale Admiralty chart.

# INSTRUCTIONS FOR THE USE OF TABLES

## TO FIND THE TIMES AND HEIGHTS OF HIGH AND LOW WATER

*Standard Ports*

The times and heights of High and Low Water are tabulated for every day of the year. The Zone Time used for the predicted times is usually the Standard Time for the area and is given at the top of each page. Care should be taken to ensure that this is the actual time zone in use on that date, the predicted time being corrected if necessary. Special care is needed for those ports whose Time is changed during the year. In the British Isles, Greenwich Mean Time is shown throughout the year and a correction must be applied during the period of "Summer Time".

The heights are shown in metres referred to the Chart Datum of the port concerned.

*Secondary Ports*

The times of High and Low Water are obtained by applying the Time Differences tabulated in Part II to the daily prediction for the most suitable (not necessarily the closest) Standard Port. The Standard Port to be used is that which appears in bold type at the head of the subsection in Part II. Other Standard Ports may occur within a subsection in their correct geographical sequence but full data for these are not shown. The times obtained by applying these corrections are in the Zone Time shown next above the Secondary Port irrespective of the Zone Time used for the Standard Port predictions. Special care is needed when considering adjacent ports in different countries which may not be keeping the same time.

The time differences given are approximately the maximum and minimum differences which will be found to occur under normal weather conditions. Although these differences are normally shown to the nearest minute it must not be assumed that the resulting predictions will be to this accuracy.

Predictions which fall between the times given for the Standard Port at the head of each column can be obtained by simple interpolation between the columns. Time differences must not be extrapolated but only interpolated between the given values for Times at Standard Port which gives values throughout a 24 hour period. Thus for secondary ports referred to SHOREHAM:

| | | | | | H.W. | | L.W. | |
|---|---|---|---|---|---|---|---|---|
| | | | | | 0500 and 1700 | 1000 and 2200 | 0000 and 1200 | 0600 and 1800 |
| 81 | **SHOREHAM** | . . . | (see page 18) | | | | | |
| 75 | Worthing | . . . | 50 48 | 0 22 | +0010 | 0000 | −0005 | −0010 |

the H.W. time difference for a tide which occurs at SHOREHAM at 1230 must be interpolated between the values tabulated for 1000 and 1700. High Waters which occur at SHOREHAM at both 2330 and at 0300 must have their time differences interpolated between those values tabulated for 2200 and 0500. If a number of tides are required stretching over a period a graphical solution is a convenient method of obtaining this interpolation.

The heights of High and Low Water are obtained by applying the height differences tabulated in Part II to the daily predictions for the same Standard Port as is used for the times. These differences are tabulated for mean spring and mean neap levels at the Standard Port. Unless there is a statement to the contrary in Part II it may be assumed that the variation is linear and differences for heights other than springs and neaps may be obtained by interpolation or extrapolation. It MUST be noted that the predictions for the Standard Ports include the Seasonal Variations for the Standard Port which may be different from those for the Secondary Port. The first step is therefore to SUBTRACT algebraically the seasonal variation for the Standard Port from the predicted height obtained from Part I. The next step is to apply the height difference corresponding to this corrected height at the Standard Port, interpolating or extrapolating as necessary. The final step is to ADD algebraically the seasonal variation for the Secondary Port. In both cases great care must be taken to ensure that the signs of the seasonal variations are correctly applied. Where no seasonal variations are given they are less than 0·1 m and can be ignored. Allowance has been made in the preparation of the tables for any difference in the level of Chart Datum between the Standard and Secondary Port and the resulting heights are referred to *Chart Datum at the Secondary Port concerned.* See Example I.

For certain ports the time differences are replaced by "*p*" indicating that no suitable Standard Port is available and predictions can only be made by using the Simplified Harmonic Method of Tidal Prediction (N.P.159). Height differences are included for these ports to enable tidal levels to be obtained but they should not be used for obtaining daily predictions.

Programmable Calculators can be used with advantage for the arithmetic of N.P. 159. A recommended method with a Form and worked example for use when programming can be found on page xxvi.

The accuracy of a prediction for a Secondary Port will depend on the amount of work involved. The less work undertaken, the less accurate the prediction is likely to be. All the data necessary for a more accurate prediction are published in this volume where such data exists.

## TO FIND THE HEIGHT OF TIDE AT TIMES BETWEEN HIGH AND LOW WATER

*Standard Ports*

Intermediate times and heights may best be predicted by the use of the Mean Spring and Neap curves which are given before the daily predictions for each port. See Examples II and III.

*Secondary Ports*

For Secondary Ports on a stretch of coast where there is little change of shape between adjacent Standard Port curves and where the duration of rise or fall at the Secondary Port is not markedly different from that of the appropriate Standard Port (i.e. where H.W. and L.W. time differences in Part II are nearly the same) intermediate times and heights may be obtained by using the Mean Spring and Neap Curves for the appropriate Standard Port. See Examples IV and V.

Between Swanage and Selsey the tide is of considerable complexity and justifies the inclusion of individual curves—shown on pages xxii to xxiv.

In some other cases the use of the Simplified Harmonic Method of Tidal Prediction (N.P.159) is recommended where the intermediate heights are important; these ports are indicated in Part II by "*c*". This method may sometimes be improved by adjusting the curve to fit high and low waters derived from the time and height differences, particularly when a large range of tide is involved.

Full instructions for the Simplified Harmonic Method of Tidal Prediction are contained in the booklet of forms N.P.159 and the remainder of this section is therefore devoted to descriptions of and instructions for the use of the Mean Spring and Neap Curves in Admiralty Tide Tables. See also page xxvi for further instructions on the use of calculators and the Simplified Harmonic Method of Tidal Prediction. The Harmonic Constants required for this method will be found in Part III of these Tables, the Tidal Angles and Factors in Table VII, and Forms A and B at the back of the book.

## CURVE INTERPOLATION

Mean Spring and Neap Curves for Standard Ports show the factor of the range attained at given time intervals relative to that of H.W.: thus by definition H.W.=1 and L.W.=0.

The Spring curve is shown in solid line and the Neap curve, where it differs from the Spring, in pecked. Interpolation can be made by eye using the plotted positions of the predicted heights with reference to the levels of M.H.W.S. etc. No attempt should be made to extrapolate beyond the Spring or Neap curves: for ranges greater than Springs the Spring curve should be used, while for ranges less than Neaps the Neap curve should be used.

Where there is an appreciable change in duration between Spring and Neap tides the results obtained may have a slight error. This error will normally be greatest near L.W. but in the few cases where the times are plotted relative to L.W. it will be greatest near H.W.

## MEAN LEVELS

The values of L.A.T., M.L.W.S., M.L.W.N., M.L., M.H.W.N., M.H.W.S. and H.A.T. are shown for Standard Ports in Table V. The values of M.L.W.S., M.L.W.N., M.H.W.N. and M.H.W.S. may be found for Secondary Ports by the direct application of the appropriate height difference tabulated in Part II.

The values of H.A.T. and L.A.T. may be found for a Secondary Port by extrapolating beyond the given differences for a tide that reaches the appropriate level at the Standard Port.

## OFFSHORE AREAS AND PLACES BETWEEN SECONDARY PORTS

Tidal predictions for offshore areas and stretches of coastline between Secondary Ports should be obtained by the use of Co-Tidal Charts. For details of Co-Tidal Charts available see page 436 and the Catalogue of Admiralty Charts. Full instructions for their use are contained on the body of the charts.

## DETAILED INSTRUCTIONS AND EXAMPLES

Form N.P.204 is intended to assist with Time and Height calculations. The examples have been carried out on these forms and the instructions refer to the boxes. Copies of the form are bound in the back of Admiralty Tide Tables and further copies in booklet form may be obtained from the agents for the sale of Admiralty Charts. This booklet also includes additional copies of most of the Standard Port Spring and Neap Curves contained in Part I of these tables.

*I. To find the time and height of H.W. and L.W. at a Secondary Port*

I. Complete heading of form N.P.204.

II. Transfer data from A.T.T. Part I to boxes (1), (2), (3) and (4).

III. Interpolate data from A.T.T. Part II and insert in boxes (7), (8,) (9) and (10).

IV. Enter Seasonal Changes for Standard and Secondary Ports from A.T.T. Part II in boxes (6) and (11).

V. Apply results of Steps III and IV to obtain boxes (12), (13), (14) and (15).

**Example:**
Find the time (B.S.T.) and height of the afternoon H.W. and L.W. at ST. MARY'S (Isles of Scilly) on 14th July.

*Note:* The data used in this example do not refer to the year of these tables.

Extract from A.T.T. Part I.

**PLYMOUTH (DEVONPORT)**

| | JULY | | |
|---|---|---|---|
| 14 | 0309 | 1.0 |
| | 0927 | 5.3 |
| SA | 1532 | 1.1 |
| | 2149 | 5.0 |

Extract from A.T.T. Part II.

| No. | PLACE | Lat. N. | Long. W. | TIME DIFFERENCES High Water Zone U.T.(G.M.T.) | | Low Water | | HEIGHT DIFFERENCES (IN METRES) MHWS | MHWN | MLWN | MLWS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 14 | **PLYMOUTH (DEVONPORT)** | (see page 2) | | **0000 and 1200** | **0600 and 1800** | **0000 and 1200** | **0600 and 1800** | **5·5** | **4·4** | **2·2** | **0·8** |
| 1 | *Isles of Scilly* St. Mary's . . . | 49 55 | 6 19 | −0030 | −0110 | −0100 | −0020 | +0·2 | −0·1 | −0·2 | −0·1 |

SEASONAL CHANGES IN MEAN LEVEL

| No. | Jan. 1 | Feb. 1 | Mar. 1 | Apr. 1 | May 1 | June 1 | July 1 | Aug. 1 | Sep. 1 | Oct. 1 | Nov. 1 | Dec. 1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1–60b | Negligible | | | | | | | | | | | |

## TIDAL PREDICTION FORM

STANDARD PORT....Devonport....TIME/HEIGHT REQUIRED.....p.m.....

SECONDARY PORT..St. Mary's.....DATE..14 July..TIME ZONE...BST....

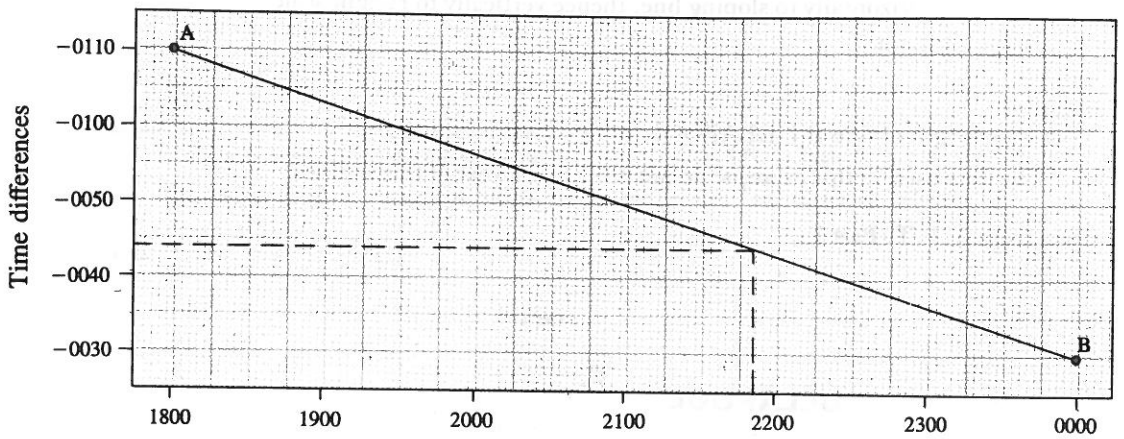
| | TIME | | HEIGHT | | |
|---|---|---|---|---|---|
| STANDARD PORT | HW | LW | HW | LW | RANGE |
| | 1 2149 | 2 1532 | 3 5.0 | 4 1·1 | 5 3.9 |
| Seasonal change | Standard Port | | 6 0.0 | 6 0.0 | |
| DIFFERENCES | 7* −0044 | 8* −0036 | 9* +0·1 | 10* −0·1 | |
| Seasonal change | Secondary port | | 11 0.0 | 11 0.0 | |
| SECONDARY PORT | 12 2105 | 13 1456 | 14 5·1 | 15 1·0 | |
| Duration | 16 0609 | | | | |

LW 1456 GMT = 1556 BST
HW 2105 GMT = 2205 BST

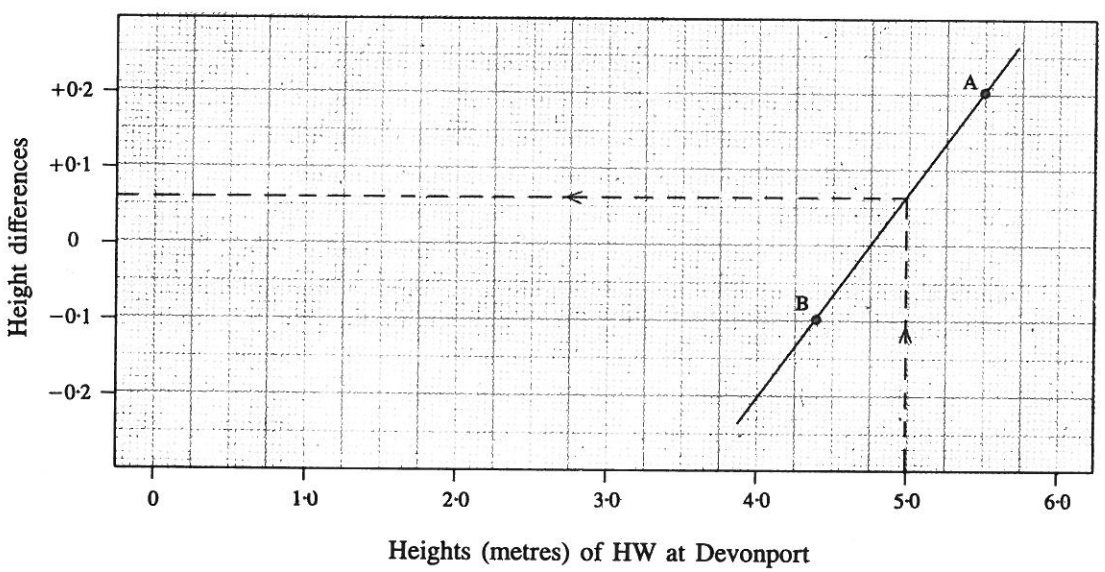
## SECONDARY PORT TIME AND HEIGHT DIFFERENCE INTERPOLATION

In most cases interpolation can be carried out by eye. For complex examples or where greater accuracy is required the use of a pocket calculator may be preferred. These interpolations can also be shown graphically at any convenient scale.

Plot the two high water time differences A (−0110 at 1800) and B (−0030 at 0000) and join AB. Read off the Time Difference for St Mary's corresponding to a HW time at Devonport of 2149 ≙ −0044.




The height difference can be plotted in the same way. Plot A (MHWS of 5·5 and +0.2) and B (MHWN of 4·4 and −0·1). Draw a line through A and B. Read off the height difference for St Mary's corresponding to a height at Devonport of 5·0 = +0·1 m.




Similarly plot the low water time and height differences.

*II. To find the height at a given time (Standard Port)*

I. On Standard Curve diagram, plot heights of H.W. and L.W. occurring either side of required time and join by sloping line.

II. Enter H.W. time and sufficient others to embrace required time.

III. From required time, proceed vertically to curves, using heights plotted in I to assist interpolation between Springs and Neaps. Do NOT extrapolate.

IV. Proceed horizontally to sloping line, thence vertically to Height scale.

V. Read off height.

**Example:**
Find the height of tide at ULLAPOOL at 1900 on 6th January.

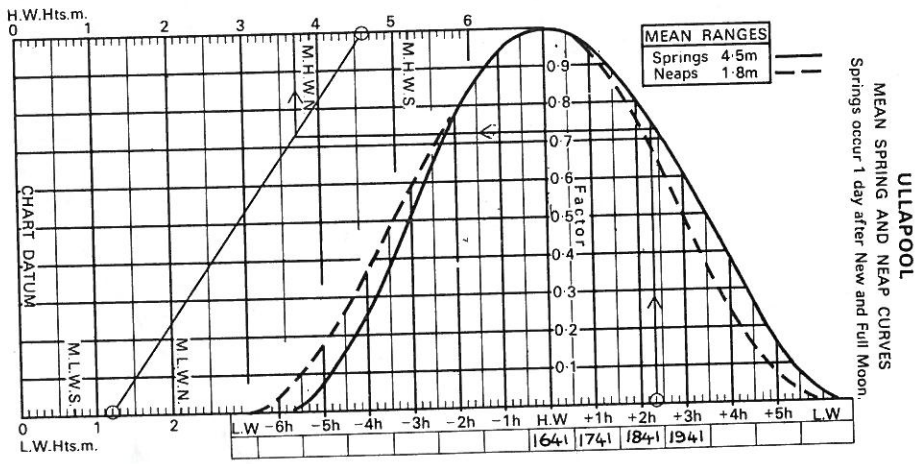
*Note:* The data used in this example do not refer to the year of these tables.

Extract from A.T.T. Part I.

JANUARY

**ULLAPOOL**

| | | | |
|---|---|---|---|
| **6** | 0420 | 4.6 |
| | 1033 | 1.6 |
| F | 1641 | 4.6 |
| | 2308 | 1.2 |




Height 3·7 m

*III. To find the time for a given height (Standard Port)*

I. On Standard Curve diagram, plot heights of H.W. and L.W. occurring either side of required event and join by sloping line.

II. Enter H.W. time and those for half-tidal cycle covering required event.

III. From required height, proceed vertically to sloping line, thence horizontally to curves, using heights plotted in I to assist interpolation between Springs and Neaps. Do NOT extrapolate.

IV. Proceed vertically to Time scale.

V. Read off time.

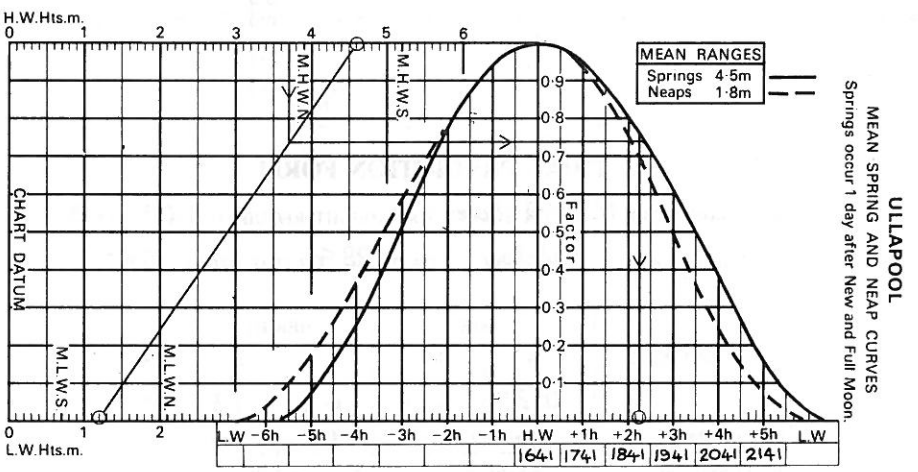
**Example:**
Find the time at which the afternoon tide at ULLAPOOL falls to 3·7 m on 6th January.

*Note:* The data used in this example do not refer to the year of these tables.

Extract from A.T.T. Part I.

JANUARY

| | | | |
|---|---|---|---|
| **ULLAPOOL** | **6** | 0420 | 4.6 |
| | | 1033 | 1.6 |
| | F | 1641 | 4.6 |
| | | 2308 | 1.2 |




Time 1855

*IV and V. Intermediate Times/Heights (Secondary Port)*

These are the same as the appropriate calculations for a Standard Port (Examples *II* and *III*) except that the Standard Curve diagram for the Standard Port must be entered with H.W. and L.W. heights and times for the Secondary Port obtained on Form N.P.204 (Example *I*). When interpolating between the Spring and Neap curves (see para. III of Examples *II* and *III*) the Range at the Standard Port must be used.

**Examples:**

Find the height of the tide at PADSTOW at 1100 on 28th February. Find the time at which the morning tide at PADSTOW falls to 4·9 m on 28th February.

*Notes:* The data used in these examples do not refer to the year of these tables.
For Instructions on graphical interpolation of differences, see page xv.

Extract from A.T.T. Part I.

**MILFORD HAVEN**

FEBRUARY

| | | | |
|---|---|---|---|
| 28 | 0315 | 1.1 |
| | 0922 | 6.6 |
| TU | 1538 | 1.3 |
| | 2145 | 6.3 |

Extract from A.T.T. Part II.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 496 | **MILFORD HAVEN** | (see page 98) | | **0100 and 1300** | **0700 and 1900** | **0100 and 1300** | **0700 and 1900** | **7·0** | **5·2** | **2·5** | **0·7** |
| 545 | Padstow . . . | 50 33 | 4 56 | −0055 | −0050 | −0040 | −0050 | +0·3 | +0·4 | +0·1 | +0·1 |

SEASONAL CHANGES IN MEAN LEVEL

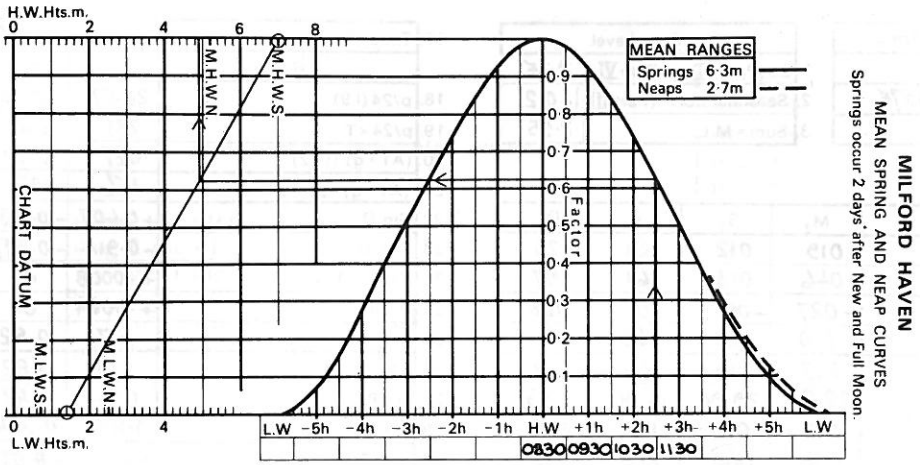
| No. | Jan. 1 | Feb. 1 | Mar. 1 | Apr. 1 | May 1 | June 1 | July 1 | Aug. 1 | Sep. 1 | Oct. 1 | Nov. 1 | Dec. 1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 496 | 0·0 | 0·0 | 0·0 | 0·0 | 0·0 | 0·0 | −0·1 | 0·0 | 0·0 | 0·0 | +0·1 | +0·1 |
| 544–548 | +0·1 | 0·0 | 0·0 | −0·1 | −0·1 | −0·1 | 0·0 | 0·0 | 0·0 | 0·0 | +0·1 | +0·1 |

## TIDAL PREDICTION FORM

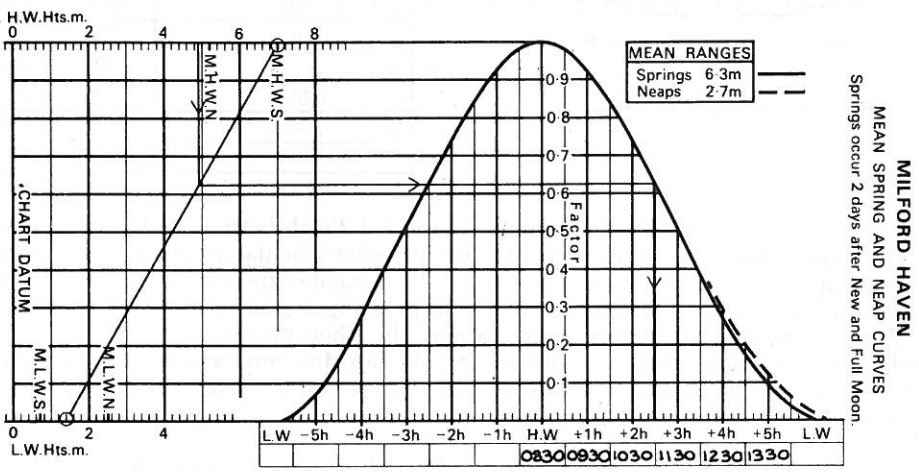
STANDARD PORT Milford Haven TIME/HEIGHT REQUIRED 1100 ; 4·9

SECONDARY PORT Padstow DATE 28 Feb TIME ZONE GMT

| | TIME | | HEIGHT | | |
|---|---|---|---|---|---|
| STANDARD PORT | HW | LW | HW | LW | RANGE |
| | 1 0922 | 2 1538 | 3 6.6 | 4 1·3 | 5 5·3 |
| Seasonal change | Standard Port | | 6 0·0 | 6 0·0 | |
| DIFFERENCES | 7* −0052 | 8* — | 9* +0·3 | 10* +0·1 | |
| Seasonal change | Secondary port | | 11 0·0 | 11 0·0 | |
| SECONDARY PORT | 12 0830 | 13 — | 14 6·9 | 15 1·4 | |
| Duration | 16 — | | | | |




Height 4·9m




Time 1100

## A

| | |
|---|---|
| Port | Example Port |
| A.T.T. No. | |
| Date | 10 July 1975 |
| Time Zone | −0800 |

| | Mean Level | |
|---|---|---|
| 1. | Zo (Part III) or (Tab VI) | 2·35 |
| 2. | Seasonal Corr. (Part III) | +0·2 |
| 3 | Sum = M.L. | 2·55 |

| | | $M_2$ | $S_2$ | $K_1$ | $O_1$ |
|---|---|---|---|---|---|
| 4. | A1 (Tab VII) | 019 | 012 | 161 | 229 |
| 5. | A2 (Tab VII) | 046 | 013 | 161 | 257 |
| 6. | A1 − A2 | −027 | −001 | 0 | −028 |
| *7. | 360. n | 720 | 720 | 360 | 360 |
| 8. | (A1 − A2) + 360.n = p | 693 | 719 | 360 | 332 |
| 9. | p/24 | 28·87 | 29·96 | 15·00 | 13·83 |
| 10. | A1 (I.4.) | 019 | 012 | 161 | 229 |
| 11. | g. (Part III) | 008 | 060 | 215 | 162 |
| 12. | A1 + g. | 027 | 072 | 016 | 031 |
| 13. | F2 (Tab VII) | 1·19 | 0·82 | 1·29 | 1·07 |
| 14. | F1 (Tab VII) | 1·17 | 0·82 | 1·28 | 1·05 |
| 15. | F2 − F1 = P | +0·02 | 0 | +0·01 | +0·02 |
| 16. | P/24 | +·0008 | 0 | +·0004 | +·0008 |

* n = 0 or smallest integer necessary to make I.8 > 600° in $M_2$ and $S_2$ columns and > 300° in $K_1$ and $O_1$ columns.

† R sin r = sum of H.Ft sin Θ for $M_2$ and $S_2$
R cos r = sum of H.Ft cos Θ for $M_2$ and $S_2$

‡ H.Ft cos Θ($K_1$)

§ H.Ft cos Θ($O_1$)

## B

| | Time = T | 0800 | | | |
|---|---|---|---|---|---|
| | H.C. | $M_2$ | $S_2$ | $K_1$ | $O_1$ |
| 18. | p/24 (I.9) | 28·87 | 29·96 | 15·00 | 13·83 |
| 19. | p/24 × T | 231 | 240 | 120 | 111 |
| 20. | (A1 + g) (I.12) | 027 | 072 | 016 | 031 |
| 21. | (A1 + g) − p.T/24 = Θ | 156 | 192 | 256 | 280 |
| 22. | Sin Θ | +0·407 | −0·213 | | |
| 23. | Cos Θ | −0·914 | −0·977 | −0·242 | +0·180 |
| 24. | P/24 (I.16) | +·0008 | 0 | +·0004 | +·0008 |
| 25. | P/24 × T | +·0064 | 0 | +·0032 | +·0064 |
| 26. | F1 (I.14) | 1·17 | 0·82 | 1·28 | 1·05 |
| 27. | F1 + P.T/24 = Ft | 1·18 | 0·82 | 1·28 | 1·06 |
| 28. | H. (Part III) | 0·94 | 0·42 | 0·23 | 0·14 |
| 29. | H × Ft. | 1·109 | 0·344 | 0·294 | 0·148 |
| 30. | (H × Ft) Sin Θ | +0·451 | −0·073 | ‡ | −0·071 |
| 31. | (H × Ft) Cos Θ | −1·014 | −0·336 | § | +0·027 |
| †32. | R sin r : R cos r | +0·378 | −1·350 | → | −1·350 |
| 33. | r : R | 164 | 1·402 | M.L. (I.3) | 2·55 |
| 34. | 2r : $R^2$ | 328 | 1·965 | | |
| 35. | $f_4$ : $F_4$ (Part III) | 290 | 0·185 | | |
| 36. | $2r + f_4 = d_4$ : $R^2.F_4 = D_4$ | 258 | 0·364 | $D_4 \cos d_4$ | −0·076 |
| 37. | 3r : $R^3$ | 132 | 2·756 | | |
| 38. | $f_6$ : $F_6$ (Part III) | 168 | 0·038 | | |
| 39. | $3r + f_6 = d_6$ : $R^3.F_6 = D_6$ | 300 | 0·105 | $D_6 \cos d_6$ | +0·052 |
| 40. | | Sum lines 30 - 39 = Height | | | 1·13 |

This variation of the Simplified Harmonic Method of Tidal Prediction (N.P.159) has been designed primarily for those who prefer to use a pocket calculator rather than obtain the solution by graphical methods. When performed in this manner there will be no saving in time required to predict a full 24 hours but there will be a slight gain in accuracy (see also note 4). However this method is probably quicker when only a short period of prediction is required, and prediction at fractions of an hour are easier. The box diagram has also been found useful to assist in programming a pocket calculator and to assist in this some additional notes have been added.

### *DETAILED INSTRUCTION FOR MANUAL COMPLETION OF FORM*

The example shows the number of decimal places required.

*Section A.* To be completed once for each day on which predictions are required.

1. Complete heading section (Port, No., Date and Time Zone).
2. From ATT Part III enter:
   - Zo (or from Tab VI) . . . . . Line 1.
   - Seasonal Change . . . . . Line 2.
   - Values of g . . . . . Line 11.
3. From ATT, Tab VII enter:
   - Values of A on required day (A1) . . . Lines 4 and 10.
   - Values of A on succeeding day (A2) . . . Line 5.
   - Values of F on required day (F1) . . . Line 14.
   - Values of F on succeeding day (F2) . . . Line 13.
4. Sum Lines 1 and 2 to obtain days value of Mean Level in Line 3.

For each column in turn:

5. Obtain Line 6 by subtracting A2 from A1.
6. Enter 360.n in Line 7. (See note under section A and Note 5).
7. Add Lines 6 and 7 to obtain daily rate of change of A (p) in Line 8.
8. Insert p/24 in Line 9.
9. Add Lines 10 and 11 to obtain (A1+g) in Line 12.
10. Subtract Line 14 from Line 13 to obtain daily rate of change of F (P) in Line 15.
11. Insert P/24 in Line 16.

*Section B.* To be completed for each time for which a prediction is required.

12. Enter Time (T) in Line 17. If your calculator has not got conversion between Hrs/Mins/Sec and Dec. Hrs it is probably best to work in decimals e.g. 1812=18·2.

13. From ATT Part III enter:

| | | |
|---|---|---|
| Values of H | | Line 28. |
| f4 | If no data are given, enter zero | Line 35 Col 1. |
| F4 | | Line 35 Col 2. |
| f6 | | Line 38 Col 1. |
| F6 | | Line 38 Col 2. |

14. From Section A enter:

| | |
|---|---|
| p/24 (Line 9) | Line 18. |
| (A1+g) (Line 12) | Line 20. |
| P/24 (Line 16) | Line 24. |
| F1 (Line 14 or direct from ATT Tab VII) | Line 26. |
| ML (Line 3) | Line 33 Col 4. |

15. Multiply p/24 by T in Line 19.

16. *Subtract* (see note 4) Line 19 from Line 20 to obtain θ in Line 21.

17. Enter Sin θ in M2 and S2 columns only of Line 22.

18. Enter Cos θ in all columns of Line 23.

19. Multiply P/24 by T in Line 25 and add to Line 26 to obtain interpolated value of F (=Ft) in Line 27.

20. Multiply H (Line 28) by Ft (Line 27). Enter result in Line 29.

21. Multiply Line 29 by Line 22 to obtain H.Ft.sin θ in M2 and S2 columns only.

22. Multiply Line 29 by Line 23 to obtain H.Ft.cos θ. Insert results for M2, S2 and O1 in appropriate columns of Line 31. Insert result for K1 in Line 30 (Col 4).

N.B. From here on the columns no longer refer to H.C.s and are referred to by their numbers.

23. Sum columns 1 and 2 of Line 30 and enter in Line 32, Col 1 (=R.sin r).

24. Sum columns 1 and 2 of Line 31 and enter in Line 32, Col 2 (=R.cos r), and Col 4.

25. From R.sin r and R.cos r obtain values of r (Line 33, Col 1) and R (Line 33 Col 2).

26. Obtain 2r in Line 34, Col 1 and 3r in Line 37, Col 1.

27. Obtain $R^2$ in Line 34 Col 2 and $R^3$ in Line 37 Col 2.

28. Add Lines 34 and 35 (Col 1) to obtain d4 in Line 36.

29. Add Lines 37 and 38 (Col 1) to obtain d6 in Line 39.

30. Multiply Lines 34 and 35 (Col 2) to obtain D4 in Line 36.

31. Multiply Lines 37 and 38 (Col 2) to obtain D6 in Line 39.

32. Obtain D4.cos d4 and insert in Line 36, Col 4.

33. Obtain D6.cos d6 and insert in Line 39, Col 4.

34. Finally sum Col 4, Lines 30, 31, 32, 33, 36 and 39; enter the result in Line 40.

*Notes.*

1. It is strongly recommended that calculations should bracket the required time and the results be plotted on any suitable squared paper. A single prediction is seldom of value as it gives no indication of the rate of rise or fall (in complicated ports it will not even be possible to ascertain whether it is rising or falling).

2. Although the box diagrams allow for entry of every step the capabilities of the calculator and the skill of the operator may enable many boxes to be left blank or placed in Memory. POLAR/RECTANGULAR conversion is particularly valuable and with this facility one can go from Line 17 to 31 without any intermediate writing down and with no ambiguity of quadrant.

3. In many cases interpolation between F1 and F2 can be carried out with sufficient accuracy by eye thus enabling Lines 13, 14, 15, 16, 24 and 25 to be omitted.

4. In order to simplify the calculation (or if being programmed to save steps and/or stores) the following approximations may be made. These are given in the order of their effect on the accuracy that with the least effect being given first:

(a) Omit lines 4 to 9. Insert the following rates in Line 18:

| | |
|---|---|
| M2 | 29·0 deg/hr. |
| S2 | 30·0 deg/hr. |
| K1 | 15·0 deg/hr. |
| O1 | 13·9 deg/hr. |

(b) As (a) but using the following rates:
M2, S2 —29·32 deg/hr.
K1, O1 —Half this figure i.e. 14·66 deg/hr.

(c) Omit interpolation of F. Hence omit Lines 13, 14, 15, 16, 24, 25 and 26 and insert Ft=F (direct from ATT Tab VII) in Line 27.

Approximations (b) and (c), together with further small approximations are in effect made in the graphical solution (N.P.159) so even after their application this method will be slightly more accurate than the graphical solution.

5. *Interpolation Between Tabulated Values of A and F.*

The hourly rates of change of A for each constituent can be calculated from consecutive tabulated values, care being taken to apply sufficient multiples of 360° to the tabulated values to ensure that these rates approximate to the astronomical values for each constituent—i.e. 30 deg/hr for M2 and S2 and 15 deg/hr for K1 and O1. This can be done as follows:

$$\text{Daily Rate } (p)=(A_1+360.n)-A_2$$

where n=0 or the smallest integer which makes p>600 in the case of M2 and S2 and p>300 in the case of K1 and O1. Then for each of the four constituents:

$$At=A_1-(T\times p)/24$$

(Note that in order to simplify the arithmetic in the graphical version of N.P.159 the final step in the calculation of values of A for each constituent is to subtract the astronomical value from 360°. The second term in the above expression is therefore SUBTRACTED.)

The interpolation for F for any given time is simpler:

$$Ft=F_1+(T\times P)/24 \text{ where } P=F_2-F_1$$

6. *Vectorial Addition of SD components*

The SD tide (R, r) at any time consists of the sum of the M2 and S2 tides. Thus:

$$R.\sin r=H.Ft.\sin(At+g) \text{ for } M_2+H.Ft.\sin(At+g) \text{ for } S_2$$
$$R.\cos r=H.Ft.\cos(At+g) \text{ for } M_2+H.Ft.\cos(At+g) \text{ for } S_2$$

and from this R and r may be obtained. If using a programmed calculator POLAR/RECTANGULAR conversion *must* be used to avoid ambiguity of sign or quadrant, but if the calculation is being done manually ordinary trig (and inverse trig) functions may be used provided great care is taken to resolve this ambiguity.

*Shallow Water Corrections*

The quarterdiurnal tide has phase $d_4=2r+f_4$
and amplitude . . . $D_4=R^2\times F_4$
and the height correction due to the quarterdiurnal effect . . . $h_4=D_4.\cos d_4$.

The sixthdiurnal tide has phase $d6=3r+f6$
and amplitude . . . $D6=R^3\times F6$
and hence height . . . . $h6=D6.\cos d6$

h4 and h6 must be summed algebraically to the combined SD and D tide to give a corrected height for the required time.

## *ADDITIONAL NOTES MORE APPLICABLE TO PROGRAMMABLE CALCULATORS*

7. Although the boxes show a possible route through the problem this may not be the best route for every calculator.

8. If storage is limited parameters can often be combined and placed each side of the decimal place after application of suitable multipliers e.g. g and H can be stored together: thus a g of 312 and H of 2·45 might be stored as 312·245. Strangely in some cases this not only reduces the number of stores required but also the program steps.

9. Given sufficient facilities on the calculator the following are recommended:
(a) Automatic stepping of TIME at both fixed and variable intervals.
(b) Ability to change Start Time of a series of predictions.
(c) Prediction of successive days without re-entry of Harmonic Constants for each day.
(d) Prediction for second port on same day without re-entry of astronomical data (A and F).
(e) Recording of Harmonic Constants for any port. Steps should be allocated for amendment of carded data to allow for any changes.

Although possible to program for the derivation of a time of HW or of LW this has been found to be of little value. In a large number of ports where this method is of greatest use the curve may be so flat at these points that the actual time derived is meaningless: at ports where a double HW or LW or intermediate "stand" occurs there may well be ambiguity as to the point on the curve obtained. In most cases it is preferable to plot a short portion of the curve from the results of successive calculations.

10. It is sometimes more convenient to work in centimetres rather than metres provided there are no Shallow Water Corrections.

# SUPPLEMENTARY TABLES

# TABLE I

## CONVERSION TABLE: METRES TO FEET

Conversion Factor 1 Foot = 0·3048 m

| Metres | Feet | Metres | Feet | Metres | Feet | Metres | Feet | Metres | Feet | Metres | Feet | Metres | Feet | Metres | Feet |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0·05 | 0·2 | 4·05 | 13·3 | 8·05 | 26·4 | 12·05 | 39·5 | 16·05 | 52·7 | 20·05 | 65·8 | 24·05 | 78·9 | 28·05 | 92·0 |
| 0·10 | 0·3 | 4·10 | 13·5 | 8·10 | 26·6 | 12·10 | 39·7 | 16·10 | 52·8 | 20·10 | 65·9 | 24·10 | 79·1 | 28·10 | 92·2 |
| 0·15 | 0·5 | 4·15 | 13·6 | 8·15 | 26·7 | 12·15 | 39·9 | 16·15 | 53·0 | 20·15 | 66·1 | 24·15 | 79·2 | 28·15 | 92·4 |
| 0·20 | 0·7 | 4·20 | 13·8 | 8·20 | 26·9 | 12·20 | 40·0 | 16·20 | 53·1 | 20·20 | 66·3 | 24·20 | 79·4 | 28·20 | 92·5 |
| 0·25 | 0·8 | 4·25 | 13·9 | 8·25 | 27·1 | 12·25 | 40·2 | 16·25 | 53·3 | 20·25 | 66·4 | 24·25 | 79·6 | 28·25 | 92·7 |
| 0·30 | 1·0 | 4·30 | 14·1 | 8·30 | 27·2 | 12·30 | 40·4 | 16·30 | 53·5 | 20·30 | 66·6 | 24·30 | 79·7 | 28·30 | 92·8 |
| 0·35 | 1·1 | 4·35 | 14·3 | 8·35 | 27·4 | 12·35 | 40·5 | 16·35 | 53·6 | 20·35 | 66·8 | 24·35 | 79·9 | 28·35 | 93·0 |
| 0·40 | 1·3 | 4·40 | 14·4 | 8·40 | 27·6 | 12·40 | 40·7 | 16·40 | 53·8 | 20·40 | 66·9 | 24·40 | 80·1 | 28·40 | 93·2 |
| 0·45 | 1·5 | 4·45 | 14·6 | 8·45 | 27·7 | 12·45 | 40·8 | 16·45 | 54·0 | 20·45 | 67·1 | 24·45 | 80·2 | 28·45 | 93·3 |
| 0·50 | 1·6 | 4·50 | 14·8 | 8·50 | 27·9 | 12·50 | 41·0 | 16·50 | 54·1 | 20·50 | 67·3 | 24·50 | 80·4 | 28·50 | 93·5 |
| 0·55 | 1·8 | 4·55 | 14·9 | 8·55 | 28·1 | 12·55 | 41·2 | 16·55 | 54·3 | 20·55 | 67·4 | 24·55 | 80·5 | 28·55 | 93·7 |
| 0·60 | 2·0 | 4·60 | 15·1 | 8·60 | 28·2 | 12·60 | 41·3 | 16·60 | 54·5 | 20·60 | 67·6 | 24·60 | 80·7 | 28·60 | 93·8 |
| 0·65 | 2·1 | 4·65 | 15·3 | 8·65 | 28·4 | 12·65 | 41·5 | 16·65 | 54·6 | 20·65 | 67·7 | 24·65 | 80·9 | 28·65 | 94·0 |
| 0·70 | 2·3 | 4·70 | 15·4 | 8·70 | 28·5 | 12·70 | 41·7 | 16·70 | 54·8 | 20·70 | 67·9 | 24·70 | 81·0 | 28·70 | 94·2 |
| 0·75 | 2·5 | 4·75 | 15·6 | 8·75 | 28·7 | 12·75 | 41·8 | 16·75 | 55·0 | 20·75 | 68·1 | 24·75 | 81·2 | 28·75 | 94·3 |
| 0·80 | 2·6 | 4·80 | 15·7 | 8·80 | 28·9 | 12·80 | 42·0 | 16·80 | 55·1 | 20·80 | 68·2 | 24·80 | 81·4 | 28·80 | 94·5 |
| 0·85 | 2·8 | 4·85 | 15·9 | 8·85 | 29·0 | 12·85 | 42·2 | 16·85 | 55·3 | 20·85 | 68·4 | 24·85 | 81·5 | 28·85 | 94·7 |
| 0·90 | 3·0 | 4·90 | 16·1 | 8·90 | 29·2 | 12·90 | 42·3 | 16·90 | 55·4 | 20·90 | 68·6 | 24·90 | 81·7 | 28·90 | 94·8 |
| 0·95 | 3·1 | 4·95 | 16·2 | 8·95 | 29·4 | 12·95 | 42·5 | 16·95 | 55·6 | 20·95 | 68·7 | 24·95 | 81·9 | 28·95 | 95·0 |
| 1·00 | 3·3 | 5·00 | 16·4 | 9·00 | 29·5 | 13·00 | 42·7 | 17·00 | 55·8 | 21·00 | 68·9 | 25·00 | 82·0 | 29·00 | 95·1 |
| 1·05 | 3·4 | 5·05 | 16·6 | 9·05 | 29·7 | 13·05 | 42·8 | 17·05 | 55·9 | 21·05 | 69·1 | 25·05 | 82·2 | 29·05 | 95·3 |
| 1·10 | 3·6 | 5·10 | 16·7 | 9·10 | 29·9 | 13·10 | 43·0 | 17·10 | 56·1 | 21·10 | 69·2 | 25·10 | 82·3 | 29·10 | 95·5 |
| 1·15 | 3·8 | 5·15 | 16·9 | 9·15 | 30·0 | 13·15 | 43·1 | 17·15 | 56·3 | 21·15 | 69·4 | 25·15 | 82·5 | 29·15 | 95·6 |
| 1·20 | 3·9 | 5·20 | 17·1 | 9·20 | 30·2 | 13·20 | 43·3 | 17·20 | 56·4 | 21·20 | 69·6 | 25·20 | 82·7 | 29·20 | 95·8 |
| 1·25 | 4·1 | 5·25 | 17·2 | 9·25 | 30·3 | 13·25 | 43·5 | 17·25 | 56·6 | 21·25 | 69·7 | 25·25 | 82·8 | 29·25 | 96·0 |
| 1·30 | 4·3 | 5·30 | 17·4 | 9·30 | 30·5 | 13·30 | 43·6 | 17·30 | 56·8 | 21·30 | 69·9 | 25·30 | 83·0 | 29·30 | 96·1 |
| 1·35 | 4·4 | 5·35 | 17·6 | 9·35 | 30·7 | 13·35 | 43·8 | 17·35 | 56·9 | 21·35 | 70·0 | 25·35 | 83·2 | 29·35 | 96·3 |
| 1·40 | 4·6 | 5·40 | 17·7 | 9·40 | 30·8 | 13·40 | 44·0 | 17·40 | 57·1 | 21·40 | 70·2 | 25·40 | 83·3 | 29·40 | 96·5 |
| 1·45 | 4·8 | 5·45 | 17·9 | 9·45 | 31·0 | 13·45 | 44·1 | 17·45 | 57·3 | 21·45 | 70·4 | 25·45 | 83·5 | 29·45 | 96·6 |
| 1·50 | 4·9 | 5·50 | 18·0 | 9·50 | 31·2 | 13·50 | 44·3 | 17·50 | 57·4 | 21·50 | 70·5 | 25·50 | 83·7 | 29·50 | 96·8 |
| 1·55 | 5·1 | 5·55 | 18·2 | 9·55 | 31·3 | 13·55 | 44·5 | 17·55 | 57·6 | 21·55 | 70·7 | 25·55 | 83·8 | 29·55 | 96·9 |
| 1·60 | 5·2 | 5·60 | 18·4 | 9·60 | 31·5 | 13·60 | 44·6 | 17·60 | 57·7 | 21·60 | 70·9 | 25·60 | 84·0 | 29·60 | 97·1 |
| 1·65 | 5·4 | 5·65 | 18·5 | 9·65 | 31·7 | 13·65 | 44·8 | 17·65 | 57·9 | 21·65 | 71·0 | 25·65 | 84·2 | 29·65 | 97·3 |
| 1·70 | 5·6 | 5·70 | 18·7 | 9·70 | 31·8 | 13·70 | 44·9 | 17·70 | 58·1 | 21·70 | 71·2 | 25·70 | 84·3 | 29·70 | 97·4 |
| 1·75 | 5·7 | 5·75 | 18·9 | 9·75 | 32·0 | 13·75 | 45·1 | 17·75 | 58·2 | 21·75 | 71·4 | 25·75 | 84·5 | 29·75 | 97·6 |
| 1·80 | 5·9 | 5·80 | 19·0 | 9·80 | 32·2 | 13·80 | 45·3 | 17·80 | 58·4 | 21·80 | 71·5 | 25·80 | 84·6 | 29·80 | 97·8 |
| 1·85 | 6·1 | 5·85 | 19·2 | 9·85 | 32·3 | 13·85 | 45·4 | 17·85 | 58·6 | 21·85 | 71·7 | 25·85 | 84·8 | 29·85 | 97·9 |
| 1·90 | 6·2 | 5·90 | 19·4 | 9·90 | 32·5 | 13·90 | 45·6 | 17·90 | 58·7 | 21·90 | 71·9 | 25·90 | 85·0 | 29·90 | 98·1 |
| 1·95 | 6·4 | 5·95 | 19·5 | 9·95 | 32·6 | 13·95 | 45·8 | 17·95 | 58·9 | 21·95 | 72·0 | 25·95 | 85·1 | 29·95 | 98·3 |
| 2·00 | 6·6 | 6·00 | 19·7 | 10·00 | 32·8 | 14·00 | 45·9 | 18·00 | 59·1 | 22·00 | 72·2 | 26·00 | 85·3 | 30·00 | 98·4 |
| 2·05 | 6·7 | 6·05 | 19·8 | 10·05 | 33·0 | 14·05 | 46·1 | 18·05 | 59·2 | 22·05 | 72·3 | 26·05 | 85·5 | 30·05 | 98·6 |
| 2·10 | 6·9 | 6·10 | 20·0 | 10·10 | 33·1 | 14·10 | 46·3 | 18·10 | 59·4 | 22·10 | 72·5 | 26·10 | 85·6 | 30·10 | 98·8 |
| 2·15 | 7·1 | 6·15 | 20·2 | 10·15 | 33·3 | 14·15 | 46·4 | 18·15 | 59·5 | 22·15 | 72·7 | 26·15 | 85·8 | 30·15 | 98·9 |
| 2·20 | 7·2 | 6·20 | 20·3 | 10·20 | 33·5 | 14·20 | 46·6 | 18·20 | 59·7 | 22·20 | 72·8 | 26·20 | 86·0 | 30·20 | 99·1 |
| 2·25 | 7·4 | 6·25 | 20·5 | 10·25 | 33·6 | 14·25 | 46·8 | 18·25 | 59·9 | 22·25 | 73·0 | 26·25 | 86·1 | 30·25 | 99·2 |
| 2·30 | 7·5 | 6·30 | 20·7 | 10·30 | 33·8 | 14·30 | 46·9 | 18·30 | 60·0 | 22·30 | 73·2 | 26·30 | 86·3 | 30·30 | 99·4 |
| 2·35 | 7·7 | 6·35 | 20·8 | 10·35 | 34·0 | 14·35 | 47·1 | 18·35 | 60·2 | 22·35 | 73·3 | 26·35 | 86·5 | 30·35 | 99·6 |
| 2·40 | 7·9 | 6·40 | 21·0 | 10·40 | 34·1 | 14·40 | 47·2 | 18·40 | 60·4 | 22·40 | 73·5 | 26·40 | 86·6 | 30·40 | 99·7 |
| 2·45 | 8·0 | 6·45 | 21·2 | 10·45 | 34·3 | 14·45 | 47·4 | 18·45 | 60·5 | 22·45 | 73·7 | 26·45 | 86·8 | 30·45 | 99·9 |
| 2·50 | 8·2 | 6·50 | 21·3 | 10·50 | 34·4 | 14·50 | 47·6 | 18·50 | 60·7 | 22·50 | 73·8 | 26·50 | 86·9 | 30·50 | 100·1 |
| 2·55 | 8·4 | 6·55 | 21·5 | 10·55 | 34·6 | 14·55 | 47·7 | 18·55 | 60·9 | 22·55 | 74·0 | 26·55 | 87·1 | 30·55 | 100·2 |
| 2·60 | 8·5 | 6·60 | 21·7 | 10·60 | 34·8 | 14·60 | 47·9 | 18·60 | 61·0 | 22·60 | 74·1 | 26·60 | 87·3 | 30·60 | 100·4 |
| 2·65 | 8·7 | 6·65 | 21·8 | 10·65 | 34·9 | 14·65 | 48·1 | 18·65 | 61·2 | 22·65 | 74·3 | 26·65 | 87·4 | 30·65 | 100·6 |
| 2·70 | 8·9 | 6·70 | 22·0 | 10·70 | 35·1 | 14·70 | 48·2 | 18·70 | 61·4 | 22·70 | 74·5 | 26·70 | 87·6 | 30·70 | 100·7 |
| 2·75 | 9·0 | 6·75 | 22·1 | 10·75 | 35·3 | 14·75 | 48·4 | 18·75 | 61·5 | 22·75 | 74·6 | 26·75 | 87·8 | 30·75 | 100·9 |
| 2·80 | 9·2 | 6·80 | 22·3 | 10·80 | 35·4 | 14·80 | 48·6 | 18·80 | 61·7 | 22·80 | 74·8 | 26·80 | 87·9 | 30·80 | 101·0 |
| 2·85 | 9·4 | 6·85 | 22·5 | 10·85 | 35·6 | 14·85 | 48·7 | 18·85 | 61·8 | 22·85 | 75·0 | 26·85 | 88·1 | 30·85 | 101·2 |
| 2·90 | 9·5 | 6·90 | 22·6 | 10·90 | 35·8 | 14·90 | 48·9 | 18·90 | 62·0 | 22·90 | 75·1 | 26·90 | 88·3 | 30·90 | 101·4 |
| 2·95 | 9·7 | 6·95 | 22·8 | 10·95 | 35·9 | 14·95 | 49·0 | 18·95 | 62·2 | 22·95 | 75·3 | 26·95 | 88·4 | 30·95 | 101·5 |
| 3·00 | 9·8 | 7·00 | 23·0 | 11·00 | 36·1 | 15·00 | 49·2 | 19·00 | 62·3 | 23·00 | 75·5 | 27·00 | 88·6 | 31·00 | 101·7 |
| 3·05 | 10·0 | 7·05 | 23·1 | 11·05 | 36·3 | 15·05 | 49·4 | 19·05 | 62·5 | 23·05 | 75·6 | 27·05 | 88·7 | 31·05 | 101·9 |
| 3·10 | 10·2 | 7·10 | 23·3 | 11·10 | 36·4 | 15·10 | 49·5 | 19·10 | 62·7 | 23·10 | 75·8 | 27·10 | 88·9 | 31·10 | 102·0 |
| 3·15 | 10·3 | 7·15 | 23·5 | 11·15 | 36·6 | 15·15 | 49·7 | 19·15 | 62·8 | 23·15 | 76·0 | 27·15 | 89·1 | 31·15 | 102·2 |
| 3·20 | 10·5 | 7·20 | 23·6 | 11·20 | 36·7 | 15·20 | 49·9 | 19·20 | 63·0 | 23·20 | 76·1 | 27·20 | 89·2 | 31·20 | 102·4 |
| 3·25 | 10·7 | 7·25 | 23·8 | 11·25 | 36·9 | 15·25 | 50·0 | 19·25 | 63·2 | 23·25 | 76·3 | 27·25 | 89·4 | 31·25 | 102·5 |
| 3·30 | 10·8 | 7·30 | 24·0 | 11·30 | 37·1 | 15·30 | 50·2 | 19·30 | 63·3 | 23·30 | 76·4 | 27·30 | 89·6 | 31·30 | 102·7 |
| 3·35 | 11·0 | 7·35 | 24·1 | 11·35 | 37·2 | 15·35 | 50·4 | 19·35 | 63·5 | 23·35 | 76·6 | 27·35 | 89·7 | 31·35 | 102·9 |
| 3·40 | 11·2 | 7·40 | 24·3 | 11·40 | 37·4 | 15·40 | 50·5 | 19·40 | 63·6 | 23·40 | 76·8 | 27·40 | 89·9 | 31·40 | 103·0 |
| 3·45 | 11·3 | 7·45 | 24·4 | 11·45 | 37·6 | 15·45 | 50·7 | 19·45 | 63·8 | 23·45 | 76·9 | 27·45 | 90·1 | 31·45 | 103·2 |
| 3·50 | 11·5 | 7·50 | 24·6 | 11·50 | 37·7 | 15·50 | 50·9 | 19·50 | 64·0 | 23·50 | 77·1 | 27·50 | 90·2 | 31·50 | 103·3 |
| 3·55 | 11·6 | 7·55 | 24·8 | 11·55 | 37·9 | 15·55 | 51·0 | 19·55 | 64·1 | 23·55 | 77·3 | 27·55 | 90·4 | 31·55 | 103·5 |
| 3·60 | 11·8 | 7·60 | 24·9 | 11·60 | 38·1 | 15·60 | 51·2 | 19·60 | 64·3 | 23·60 | 77·4 | 27·60 | 90·6 | 31·60 | 103·7 |
| 3·65 | 12·0 | 7·65 | 25·1 | 11·65 | 38·2 | 15·65 | 51·3 | 19·65 | 64·5 | 23·65 | 77·6 | 27·65 | 90·7 | 31·65 | 103·8 |
| 3·70 | 12·1 | 7·70 | 25·3 | 11·70 | 38·4 | 15·70 | 51·5 | 19·70 | 64·6 | 23·70 | 77·8 | 27·70 | 90·9 | 31·70 | 104·0 |
| 3·75 | 12·3 | 7·75 | 25·4 | 11·75 | 38·5 | 15·75 | 51·7 | 19·75 | 64·8 | 23·75 | 77·9 | 27·75 | 91·0 | 31·75 | 104·2 |
| 3·80 | 12·5 | 7·80 | 25·6 | 11·80 | 38·7 | 15·80 | 51·8 | 19·80 | 65·0 | 23·80 | 78·1 | 27·80 | 91·2 | 31·80 | 104·3 |
| 3·85 | 12·6 | 7·85 | 25·8 | 11·85 | 38·9 | 15·85 | 52·0 | 19·85 | 65·1 | 23·85 | 78·2 | 27·85 | 91·4 | 31·85 | 104·5 |
| 3·90 | 12·8 | 7·90 | 25·9 | 11·90 | 39·0 | 15·90 | 52·2 | 19·90 | 65·3 | 23·90 | 78·4 | 27·90 | 91·5 | 31·90 | 104·7 |
| 3·95 | 13·0 | 7·95 | 26·1 | 11·95 | 39·2 | 15·95 | 52·3 | 19·95 | 65·5 | 23·95 | 78·6 | 27·95 | 91·7 | 31·95 | 104·8 |
| 4·00 | 13·1 | 8·00 | 26·2 | 12·00 | 39·4 | 16·00 | 52·5 | 20·00 | 65·6 | 24·00 | 78·7 | 28·00 | 91·9 | 32·00 | 105·0 |

# TABLE II MULTIPLICATION TABLE

RANGE

| 1·00 | 1·2 | 1·4 | 1·6 | 1·8 | 2·0 | 2·2 | 2·4 | 2·6 | 2·8 | 3·0 | 3·2 | 3·4 | 3·6 | 3·8 | 4·0 | 4·2 | 4·4 | 4·6 | 4·8 | 5·0 | 5·2 | 5·4 | 5·6 | 5·8 | 1·00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ·98 | 1·2 | 1·4 | 1·6 | 1·8 | 2·0 | 2·2 | 2·4 | 2·5 | 2·7 | 2·9 | 3·1 | 3·3 | 3·5 | 3·7 | 3·9 | 4·1 | 4·3 | 4·5 | 4·7 | 4·9 | 5·1 | 5·3 | 5·5 | 5·7 | ·98 |
| ·96 | 1·2 | 1·3 | 1·5 | 1·7 | 1·9 | 2·1 | 2·3 | 2·5 | 2·7 | 2·9 | 3·1 | 3·3 | 3·5 | 3·6 | 3·8 | 4·0 | 4·2 | 4·4 | 4·6 | 4·8 | 5·0 | 5·2 | 5·4 | 5·6 | ·96 |
| ·94 | 1·1 | 1·3 | 1·5 | 1·7 | 1·9 | 2·1 | 2·3 | 2·4 | 2·6 | 2·8 | 3·0 | 3·2 | 3·4 | 3·6 | 3·8 | 3·9 | 4·1 | 4·3 | 4·5 | 4·7 | 4·9 | 5·1 | 5·3 | 5·5 | ·94 |
| ·92 | 1·1 | 1·3 | 1·5 | 1·7 | 1·8 | 2·0 | 2·2 | 2·4 | 2·6 | 2·8 | 2·9 | 3·1 | 3·3 | 3·5 | 3·7 | 3·9 | 4·0 | 4·2 | 4·4 | 4·6 | 4·8 | 5·0 | 5·2 | 5·3 | ·92 |
| ·90 | 1·1 | 1·3 | 1·4 | 1·6 | 1·8 | 2·0 | 2·2 | 2·3 | 2·5 | 2·7 | 2·9 | 3·1 | 3·2 | 3·4 | 3·6 | 3·8 | 4·0 | 4·1 | 4·3 | 4·5 | 4·7 | 4·9 | 5·0 | 5·2 | ·90 |
| ·88 | 1·1 | 1·2 | 1·4 | 1·6 | 1·8 | 1·9 | 2·1 | 2·3 | 2·5 | 2·6 | 2·8 | 3·0 | 3·2 | 3·3 | 3·5 | 3·7 | 3·9 | 4·0 | 4·2 | 4·4 | 4·6 | 4·8 | 4·9 | 5·1 | ·88 |
| ·86 | 1·0 | 1·2 | 1·4 | 1·5 | 1·7 | 1·9 | 2·1 | 2·2 | 2·4 | 2·6 | 2·8 | 2·9 | 3·1 | 3·3 | 3·4 | 3·6 | 3·8 | 4·0 | 4·1 | 4·3 | 4·5 | 4·6 | 4·8 | 5·0 | ·86 |
| ·84 | 1·0 | 1·2 | 1·3 | 1·5 | 1·7 | 1·8 | 2·0 | 2·2 | 2·4 | 2·5 | 2·7 | 2·9 | 3·0 | 3·2 | 3·4 | 3·5 | 3·7 | 3·9 | 4·0 | 4·2 | 4·4 | 4·5 | 4·7 | 4·9 | ·84 |
| ·82 | 1·0 | 1·1 | 1·3 | 1·5 | 1·6 | 1·8 | 2·0 | 2·1 | 2·3 | 2·5 | 2·6 | 2·8 | 3·0 | 3·1 | 3·3 | 3·4 | 3·6 | 3·8 | 3·9 | 4·1 | 4·3 | 4·4 | 4·6 | 4·8 | ·82 |
| ·80 | 1·0 | 1·1 | 1·3 | 1·4 | 1·6 | 1·8 | 1·9 | 2·1 | 2·2 | 2·4 | 2·6 | 2·7 | 2·9 | 3·0 | 3·2 | 3·4 | 3·5 | 3·7 | 3·8 | 4·0 | 4·2 | 4·3 | 4·5 | 4·6 | ·80 |
| ·78 | 0·9 | 1·1 | 1·2 | 1·4 | 1·6 | 1·7 | 1·9 | 2·0 | 2·2 | 2·3 | 2·5 | 2·7 | 2·8 | 3·0 | 3·1 | 3·3 | 3·4 | 3·6 | 3·7 | 3·9 | 4·1 | 4·2 | 4·4 | 4·5 | ·78 |
| ·76 | 0·9 | 1·1 | 1·2 | 1·4 | 1·5 | 1·7 | 1·8 | 2·0 | 2·1 | 2·3 | 2·4 | 2·6 | 2·7 | 2·9 | 3·0 | 3·2 | 3·3 | 3·5 | 3·6 | 3·8 | 4·0 | 4·1 | 4·3 | 4·4 | ·76 |
| ·74 | 0·9 | 1·0 | 1·2 | 1·3 | 1·5 | 1·6 | 1·8 | 1·9 | 2·1 | 2·2 | 2·4 | 2·5 | 2·7 | 2·8 | 3·0 | 3·1 | 3·3 | 3·4 | 3·6 | 3·7 | 3·8 | 4·0 | 4·1 | 4·3 | ·74 |
| ·72 | 0·9 | 1·0 | 1·2 | 1·3 | 1·4 | 1·6 | 1·7 | 1·9 | 2·0 | 2·2 | 2·3 | 2·4 | 2·6 | 2·7 | 2·9 | 3·0 | 3·2 | 3·3 | 3·5 | 3·6 | 3·7 | 3·9 | 4·0 | 4·2 | ·72 |
| ·70 | 0·8 | 1·0 | 1·1 | 1·3 | 1·4 | 1·5 | 1·7 | 1·8 | 2·0 | 2·1 | 2·2 | 2·4 | 2·5 | 2·7 | 2·8 | 2·9 | 3·1 | 3·2 | 3·4 | 3·5 | 3·6 | 3·8 | 3·9 | 4·1 | ·70 |
| ·68 | 0·8 | 1·0 | 1·1 | 1·2 | 1·4 | 1·5 | 1·6 | 1·8 | 1·9 | 2·0 | 2·2 | 2·3 | 2·4 | 2·6 | 2·7 | 2·9 | 3·0 | 3·1 | 3·3 | 3·4 | 3·5 | 3·7 | 3·8 | 3·9 | ·68 |
| ·66 | 0·8 | 0·9 | 1·1 | 1·2 | 1·3 | 1·5 | 1·6 | 1·7 | 1·8 | 2·0 | 2·1 | 2·2 | 2·4 | 2·5 | 2·6 | 2·8 | 2·9 | 3·0 | 3·2 | 3·3 | 3·4 | 3·6 | 3·7 | 3·8 | ·66 |
| ·64 | 0·8 | 0·9 | 1·0 | 1·1 | 1·3 | 1·4 | 1·5 | 1·7 | 1·8 | 1·9 | 2·0 | 2·2 | 2·3 | 2·4 | 2·6 | 2·7 | 2·8 | 2·9 | 3·1 | 3·2 | 3·3 | 3·5 | 3·6 | 3·7 | ·64 |
| ·62 | 0·7 | 0·9 | 1·0 | 1·1 | 1·2 | 1·4 | 1·5 | 1·6 | 1·7 | 1·9 | 2·0 | 2·1 | 2·2 | 2·4 | 2·5 | 2·6 | 2·7 | 2·9 | 3·0 | 3·1 | 3·2 | 3·3 | 3·5 | 3·6 | ·62 |
| ·60 | 0·7 | 0·8 | 1·0 | 1·1 | 1·2 | 1·3 | 1·4 | 1·6 | 1·7 | 1·8 | 1·9 | 2·0 | 2·2 | 2·3 | 2·4 | 2·5 | 2·6 | 2·8 | 2·9 | 3·0 | 3·1 | 3·2 | 3·4 | 3·5 | ·60 |
| ·58 | 0·7 | 0·8 | 0·9 | 1·0 | 1·2 | 1·3 | 1·4 | 1·5 | 1·6 | 1·7 | 1·9 | 2·0 | 2·1 | 2·2 | 2·3 | 2·4 | 2·6 | 2·7 | 2·8 | 2·9 | 3·0 | 3·1 | 3·2 | 3·4 | ·58 |
| ·56 | 0·7 | 0·8 | 0·9 | 1·0 | 1·1 | 1·2 | 1·3 | 1·5 | 1·6 | 1·7 | 1·8 | 1·9 | 2·0 | 2·1 | 2·2 | 2·4 | 2·5 | 2·6 | 2·7 | 2·8 | 2·9 | 3·0 | 3·1 | 3·2 | ·56 |
| ·54 | 0·6 | 0·8 | 0·9 | 1·0 | 1·1 | 1·2 | 1·3 | 1·4 | 1·5 | 1·6 | 1·7 | 1·8 | 1·9 | 2·1 | 2·2 | 2·3 | 2·4 | 2·5 | 2·6 | 2·7 | 2·8 | 2·9 | 3·0 | 3·1 | ·54 |
| ·52 | 0·6 | 0·7 | 0·8 | 0·9 | 1·0 | 1·1 | 1·2 | 1·4 | 1·5 | 1·6 | 1·7 | 1·8 | 1·9 | 2·0 | 2·1 | 2·2 | 2·3 | 2·4 | 2·5 | 2·6 | 2·7 | 2·8 | 2·9 | 3·0 | ·52 |
| ·50 | 0·6 | 0·7 | 0·8 | 0·9 | 1·0 | 1·1 | 1·2 | 1·3 | 1·4 | 1·5 | 1·6 | 1·7 | 1·8 | 1·9 | 2·0 | 2·1 | 2·2 | 2·3 | 2·4 | 2·5 | 2·6 | 2·7 | 2·8 | 2·9 | ·50 |
| ·48 | 0·6 | 0·7 | 0·8 | 0·9 | 1·0 | 1·1 | 1·2 | 1·2 | 1·3 | 1·4 | 1·5 | 1·6 | 1·7 | 1·8 | 1·9 | 2·0 | 2·1 | 2·2 | 2·3 | 2·4 | 2·5 | 2·6 | 2·7 | 2·8 | ·48 |
| ·46 | 0·6 | 0·6 | 0·7 | 0·8 | 0·9 | 1·0 | 1·1 | 1·2 | 1·3 | 1·4 | 1·5 | 1·6 | 1·7 | 1·7 | 1·8 | 1·9 | 2·0 | 2·1 | 2·2 | 2·3 | 2·4 | 2·5 | 2·6 | 2·7 | ·46 |
| ·44 | 0·5 | 0·6 | 0·7 | 0·8 | 0·9 | 1·0 | 1·1 | 1·1 | 1·2 | 1·3 | 1·4 | 1·5 | 1·6 | 1·7 | 1·8 | 1·8 | 1·9 | 2·0 | 2·1 | 2·2 | 2·3 | 2·4 | 2·5 | 2·6 | ·44 |
| ·42 | 0·5 | 0·6 | 0·7 | 0·8 | 0·8 | 0·9 | 1·0 | 1·1 | 1·2 | 1·3 | 1·3 | 1·4 | 1·5· | 1·6 | 1·7 | 1·8 | 1·8 | 1·9 | 2·0 | 2·1 | 2·2 | 2·3 | 2·4 | 2·4 | ·42 |
| ·40 | 0·5 | 0·6 | 0·6 | 0·7 | 0·8 | 0·9 | 1·0 | 1·0 | 1·1 | 1·2 | 1·3 | 1·4 | 1·4 | 1·5 | 1·6 | 1·7 | 1·8 | 1·8 | 1·9 | 2·0 | 2·1 | 2·2 | 2·2 | 2·3 | ·40 |
| ·38 | 0·5 | 0·5 | 0·6 | 0·7 | 0·8 | 0·8 | 0·9 | 1·0 | 1·1 | 1·1 | 1·2 | 1·3 | 1·4 | 1·4 | 1·5 | 1·6 | 1·7 | 1·7 | 1·8 | 1·9 | 2·0 | 2·1 | 2·1 | 2·2 | ·38 |
| ·36 | 0·4 | 0·5 | 0·6 | 0·6 | 0·7 | 0·8 | 0·9 | 0·9 | 1·0 | 1·1 | 1·2 | 1·2 | 1·3 | 1·4 | 1·4 | 1·5 | 1·6 | 1·7 | 1·7 | 1·8 | 1·9 | 1·9 | 2·0 | 2·1 | ·36 |
| ·34 | 0·4 | 0·5 | 0·5 | 0·6 | 0·7 | 0·7 | 0·8 | 0·9 | 1·0 | 1·0 | 1·1 | 1·2 | 1·3 | 1·3 | 1·4 | 1·4 | 1·5 | 1·6 | 1·6 | 1·7 | 1·8 | 1·8 | 1·9 | 2·0 | ·34 |
| ·32 | 0·4 | 0·4 | 0·5 | 0·6 | 0·6 | 0·7 | 0·8 | 0·8 | 0·9 | 1·0 | 1·0 | 1·1 | 1·2 | 1·2 | 1·3 | 1·3 | 1·4 | 1·5 | 1·5 | 1·6 | 1·7 | 1·7 | 1·8 | 1·9 | ·32 |
| ·30 | 0·4 | 0·4 | 0·5 | 0·5 | 0·6 | 0·7 | 0·7 | 0·8 | 0·8 | 0·9 | 1·0 | 1·0 | 1·1 | 1·1 | 1·2 | 1·3 | 1·3 | 1·4 | 1·4 | 1·5 | 1·6 | 1·6 | 1·7 | 1·7 | ·30 |
| ·28 | 0·3 | 0·4 | 0·4 | 0·5 | 0·6 | 0·6 | 0·7 | 0·7 | 0·8 | 0·8 | 0·9 | 1·0 | 1·0 | 1·1 | 1·1 | 1·2 | 1·2 | 1·3 | 1·3 | 1·4 | 1·5 | 1·5 | 1·6 | 1·6 | ·28 |
| ·26 | 0·3 | 0·4 | 0·4 | 0·5 | 0·5 | 0·6 | 0·6 | 0·7 | 0·7 | 0·8 | 0·8 | 0·9 | 0·9 | 1·0 | 1·0 | 1·1 | 1·1 | 1·2 | 1·2 | 1·3 | 1·4 | 1·4 | 1·5 | 1·5 | ·26 |
| ·24 | 0·3 | 0·3 | 0·4 | 0·4 | 0·5 | 0·5 | 0·6 | 0·6 | 0·7 | 0·7 | 0·8 | 0·8 | 0·9 | 0·9 | 1·0 | 1·0 | 1·1 | 1·1 | 1·2 | 1·2 | 1·2 | 1·3 | 1·3 | 1·4 | ·24 |
| ·22 | 0·3 | 0·3 | 0·4 | 0·4 | 0·4 | 0·5 | 0·5 | 0·6 | 0·6 | 0·7 | 0·7 | 0·7 | 0·8 | 0·8 | 0·9 | 0·9 | 1·0 | 1·0 | 1·1 | 1·1 | 1·1 | 1·2 | 1·2 | 1·3 | ·22 |
| ·20 | 0·2 | 0·3 | 0·3 | 0·4 | 0·4 | 0·4 | 0·5 | 0·5 | 0·6 | 0·6 | 0·6 | 0·7 | 0·7 | 0·8 | 0·8 | 0·8 | 0·9 | 0·9 | 1·0 | 1·0 | 1·0 | 1·1 | 1·1 | 1·2 | ·20 |
| ·18 | 0·2 | 0·3 | 0·3 | 0·3 | 0·4 | 0·4 | 0·4 | 0·5 | 0·5 | 0·5 | 0·6 | 0·6 | 0·6 | 0·7 | 0·7 | 0·8 | 0·8 | 0·8 | 0·9 | 0·9 | 0·9 | 1·0 | 1·0 | 1·0 | ·18 |
| ·16 | 0·2 | 0·2 | 0·2 | 0·3 | 0·3 | 0·4 | 0·4 | 0·4 | 0·4 | 0·5 | 0·5 | 0·5 | 0·6 | 0·6 | 0·6 | 0·7 | 0·7 | 0·7 | 0·8 | 0·8 | 0·8 | 0·9 | 0·9 | 0·9 | ·16 |
| ·14 | 0·2 | 0·2 | 0·2 | 0·2 | 0·3 | 0·3 | 0·3 | 0·4 | 0·4 | 0·4 | 0·4 | 0·5 | 0·5 | 0·5 | 0·6 | 0·6 | 0·6 | 0·6 | 0·7 | 0·7 | 0·7 | 0·8 | 0·8 | 0·8 | ·14 |
| ·12 | 0·1 | 0·2 | 0·2 | 0·2 | 0·2 | 0·3 | 0·3 | 0·3 | 0·3 | 0·4 | 0·4 | 0·4 | 0·4 | 0·5 | 0·5 | 0·5 | 0·5 | 0·6 | 0·6 | 0·6 | 0·6 | 0·6 | 0·7 | 0·7 | ·12 |
| ·10 | 0·1 | 0·1 | 0·2 | 0·2 | 0·2 | 0·2 | 0·2 | 0·3 | 0·3 | 0·3 | 0·3 | 0·3 | 0·4 | 0·4 | 0·4 | 0·4 | 0·4 | 0·5 | 0·5 | 0·5 | 0·5 | 0·5 | 0·6 | 0·6 | ·10 |
| ·08 | 0·1 | 0·1 | 0·1 | 0·1 | 0·2 | 0·2 | 0·2 | 0·2 | 0·2 | 0·2 | 0·3 | 0·3 | 0·3 | 0·3 | 0·3 | 0·3 | 0·4 | 0·4 | 0·4 | 0·4 | 0·4 | 0·4 | 0·4 | 0·5 | ·08 |
| ·06 | 0·1 | 0·1 | 0·1 | 0·1 | 0·1 | 0·1 | 0·2 | 0·2 | 0·2 | 0·2 | 0·2 | 0·2 | 0·2 | 0·2 | 0·2 | 0·3 | 0·3 | 0·3 | 0·3 | 0·3 | 0·3 | 0·3 | 0·3 | 0·3 | ·06 |
| ·04 | 0·0 | 0·1 | 0·1 | 0·1 | 0·1 | 0·1 | 0·1 | 0·1 | 0·1 | 0·1 | 0·1 | 0·1 | 0·1 | 0·2 | 0·2 | 0·2 | 0·2 | 0·2 | 0·2 | 0·2 | 0·2 | 0·2 | 0·2 | 0·2 | ·04 |
| ·02 | 0·0 | 0·0 | 0·0 | 0·0 | 0·0 | 0·0 | 0·0 | 0·1 | 0·1 | 0·1 | 0·1 | 0·1 | 0·1 | 0·1 | 0·1 | 0·1 | 0·1 | 0·1 | 0·1 | 0·1 | 0·1 | 0·1 | 0·1 | 0·1 | ·02 |

FACTOR

RANGE

| 1·00 | 6·0 | 6·5 | 7·0 | 7·5 | 8·0 | 8·5 | 9·0 | 9·5 | 10·0 | 10·5 | 11·0 | 11·5 | 12·0 | 12·5 | 13·0 | 13·5 | 14·0 | 14·5 | 15·0 | 15·5 | 16·0 | 16·5 | 17·0 | 17·5 | 1·00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ·98 | 5·9 | 6·4 | 6·9 | 7·3 | 7·8 | 8·3 | 8·8 | 9·3 | 9·8 | 10·3 | 10·8 | 11·3 | 11·8 | 12·2 | 12·7 | 13·2 | 13·7 | 14·2 | 14·7 | 15·2 | 15·7 | 16·2 | 16·7 | 17·1 | ·98 |
| ·96 | 5·8 | 6·2 | 6·7 | 7·2 | 7·7 | 8·2 | 8·6 | 9·1 | 9·6 | 10·1 | 10·6 | 11·0 | 11·5 | 12·0 | 12·5 | 13·0 | 13·4 | 13·9 | 14·4 | 14·9 | 15·4 | 15·8 | 16·3 | 16·8 | ·96 |
| ·94 | 5·6 | 6·1 | 6·6 | 7·0 | 7·5 | 8·0 | 8·5 | 8·9 | 9·4 | 9·9 | 10·3 | 10·8 | 11·3 | 11·7 | 12·2 | 12·7 | 13·2 | 13·6 | 14·1 | 14·6 | 15·0 | 15·5 | 16·0 | 16·4 | ·94 |
| ·92 | 5·5 | 6·0 | 6·4 | 6·9 | 7·4 | 7·8 | 8·3 | 8·7 | 9·2 | 9·7 | 10·1 | 10·6 | 11·0 | 11·5 | 12·0 | 12·4 | 12·9 | 13·3 | 13·8 | 14·3 | 14·7 | 15·2 | 15·6 | 16·1 | ·92 |
| ·90 | 5·4 | 5·8 | 6·3 | 6·7 | 7·2 | 7·6 | 8·1 | 8·5 | 9·0 | 9·4 | 9·9 | 10·3 | 10·8 | 11·2 | 11·7 | 12·1 | 12·6 | 13·0 | 13·5 | 13·9 | 14·4 | 14·8 | 15·3 | 15·7 | ·90 |
| ·88 | 5·3 | 5·7 | 6·2 | 6·6 | 7·0 | 7·5 | 7·9 | 8·4 | 8·8 | 9·2 | 9·7 | 10·1 | 10·6 | 11·0 | 11·4 | 11·9 | 12·3 | 12·8 | 13·2 | 13·6 | 14·1 | 14·5 | 15·0 | 15·4 | ·88 |
| ·86 | 5·2 | 5·6 | 6·0 | 6·4 | 6·9 | 7·3 | 7·7 | 8·2 | 8·6 | 9·0 | 9·5 | 9·9 | 10·3 | 10·7 | 11·2 | 11·6 | 12·0 | 12·5 | 12·9 | 13·3 | 13·8 | 14·2 | 14·6 | 15·0 | ·86 |
| ·84 | 5·0 | 5·5 | 5·9 | 6·3 | 6·7 | 7·1 | 7·6 | 8·0 | 8·4 | 8·8 | 9·2 | 9·7 | 10·1 | 10·5 | 10·9 | 11·3 | 11·8 | 12·2 | 12·6 | 13·0 | 13·4 | 13·9 | 14·3 | 14·7 | ·84 |
| ·82 | 4·9 | 5·3 | 5·7 | 6·1 | 6·6 | 7·0 | 7·4 | 7·8 | 8·2 | 8·6 | 9·0 | 9·4 | 9·8 | 10·2 | 10·7 | 11·1 | 11·5 | 11·9 | 12·3 | 12·7 | 13·1 | 13·5 | 13·9 | 14·3 | ·82 |
| ·80 | 4·8 | 5·2 | 5·6 | 6·0 | 6·4 | 6·8 | 7·2 | 7·6 | 8·0 | 8·4 | 8·8 | 9·2 | 9·6 | 10·0 | 10·4 | 10·8 | 11·2 | 11·6 | 12·0 | 12·4 | 12·8 | 13·2 | 13·6 | 14·0 | ·80 |
| ·78 | 4·7 | 5·1 | 5·5 | 5·8 | 6·2 | 6·6 | 7·0 | 7·4 | 7·8 | 8·2 | 8·6 | 9·0 | 9·4 | 9·7 | 10·1 | 10·5 | 10·9 | 11·3 | 11·7 | 12·1 | 12·5 | 12·9 | 13·3 | 13·6 | ·78 |
| ·76 | 4·6 | 4·9 | 5·3 | 5·7 | 6·1 | 6·5 | 6·8 | 7·2 | 7·6 | 8·0 | 8·4 | 8·7 | 9·1 | 9·5 | 9·9 | 10·3 | 10·6 | 11·0 | 11·4 | 11·8 | 12·2 | 12·5 | 12·9 | 13·3 | ·76 |
| ·74 | 4·4 | 4·8 | 5·2 | 5·5 | 5·9 | 6·3 | 6·7 | 7·0 | 7·4 | 7·8 | 8·1 | 8·5 | 8·9 | 9·2 | 9·6 | 10·0 | 10·4 | 10·7 | 11·1 | 11·5 | 11·8 | 12·2 | 12·6 | 12·9 | ·74 |
| ·72 | 4·3 | 4·7 | 5·0 | 5·4 | 5·8 | 6·1 | 6·5 | 6·8 | 7·2 | 7·6 | 7·9 | 8·3 | 8·6 | 9·0 | 9·4 | 9·7 | 10·1 | 10·4 | 10·8 | 11·2 | 11·5 | 11·9 | 12·2 | 12·6 | ·72 |
| ·70 | 4·2 | 4·5 | 4·9 | 5·2 | 5·6 | 5·9 | 6·3 | 6·6 | 7·0 | 7·3 | 7·7 | 8·0 | 8·4 | 8·7 | 9·1 | 9·4 | 9·8 | 10·1 | 10·5 | 10·8 | 11·2 | 11·5 | 11·9 | 12·2 | ·70 |
| ·68 | 4·1 | 4·4 | 4·8 | 5·1 | 5·4 | 5·8 | 6·1 | 6·5 | 6·8 | 7·1 | 7·5 | 7·8 | 8·2 | 8·5 | 8·8 | 9·2 | 9·5 | 9·9 | 10·2 | 10·5 | 10·9 | 11·2 | 11·6 | 11·9 | ·68 |
| ·66 | 4·0 | 4·3 | 4·6 | 4·9 | 5·3 | 5·6 | 5·9 | 6·3 | 6·6 | 6·9 | 7·3 | 7·6 | 7·9 | 8·2 | 8·6 | 8·9 | 9·2 | 9·6 | 9·9 | 10·2 | 10·6 | 10·9 | 11·2 | 11·5 | ·66 |
| ·64 | 3·8 | 4·2 | 4·5 | 4·8 | 5·1 | 5·4 | 5·8 | 6·1 | 6·4 | 6·7 | 7·0 | 7·4 | 7·7 | 8·0 | 8·3 | 8·6 | 9·0 | 9·3 | 9·6 | 9·9 | 10·2 | 10·6 | 10·9 | 11·2 | ·64 |
| ·62 | 3·7 | 4·0 | 4·3 | 4·6 | 5·0 | 5·3 | 5·6 | 5·9 | 6·2 | 6·5 | 6·8 | 7·1 | 7·4 | 7·7 | 8·1 | 8·4 | 8·7 | 9·0 | 9·3 | 9·6 | 9·9 | 10·2 | 10·5 | 10·8 | ·62 |
| ·60 | 3·6 | 3·9 | 4·2 | 4·5 | 4·8 | 5·1 | 5·4 | 5·7 | 6·0 | 6·3 | 6·6 | 6·9 | 7·2 | 7·5 | 7·8 | 8·1 | 8·4 | 8·7 | 9·0 | 9·3 | 9·6 | 9·9 | 10·2 | 10·5 | ·60 |
| ·58 | 3·5 | 3·8 | 4·1 | 4·3 | 4·6 | 4·9 | 5·2 | 5·5 | 5·8 | 6·1 | 6·4 | 6·7 | 7·0 | 7·2 | 7·5 | 7·8 | 8·1 | 8·4 | 8·7 | 9·0 | 9·3 | 9·6 | 9·9 | 10·1 | ·58 |
| ·56 | 3·4 | 3·6 | 3·9 | 4·2 | 4·5 | 4·8 | 5·0 | 5·3 | 5·6 | 5·9 | 6·2 | 6·4 | 6·7 | 7·0 | 7·3 | 7·6 | 7·8 | 8·1 | 8·4 | 8·7 | 9·0 | 9·2 | 9·5 | 9·8 | ·56 |
| ·54 | 3·2 | 3·5 | 3·8 | 4·0 | 4·3 | 4·6 | 4·9 | 5·1 | 5·4 | 5·7 | 5·9 | 6·2 | 6·5 | 6·7 | 7·0 | 7·3 | 7·6 | 7·8 | 8·1 | 8·4 | 8·6 | 8·9 | 9·2 | 9·4 | ·54 |
| ·52 | 3·1 | 3·4 | 3·6 | 3·9 | 4·2 | 4·4 | 4·7 | 4·9 | 5·2 | 5·5 | 5·7 | 6·0 | 6·2 | 6·5 | 6·8 | 7·0 | 7·3 | 7·5 | 7·8 | 8·1 | 8·3 | 8·6 | 8·8 | 9·1 | ·52 |
| ·50 | 3·0 | 3·2 | 3·5 | 3·7 | 4·0 | 4·2 | 4·5 | 4·7 | 5·0 | 5·2 | 5·5 | 5·7 | 6·0 | 6·2 | 6·5 | 6·7 | 7·0 | 7·2 | 7·5 | 7·7 | 8·0 | 8·2 | 8·5 | 8·7 | ·50 |
| ·48 | 2·9 | 3·1 | 3·4 | 3·6 | 3·8 | 4·1 | 4·3 | 4·6 | 4·8 | 5·0 | 5·3 | 5·5 | 5·8 | 6·0 | 6·2 | 6·5 | 6·7 | 7·0 | 7·2 | 7·4 | 7·7 | 7·9 | 8·2 | 8·4 | ·48 |
| ·46 | 2·8 | 3·0 | 3·2 | 3·4 | 3·7 | 3·9 | 4·1 | 4·4 | 4·6 | 4·8 | 5·1 | 5·3 | 5·5 | 5·7 | 6·0 | 6·2 | 6·4 | 6·7 | 6·9 | 7·1 | 7·4 | 7·6 | 7·8 | 8·0 | ·46 |
| ·44 | 2·6 | 2·9 | 3·1 | 3·3 | 3·5 | 3·7 | 4·0 | 4·2 | 4·4 | 4·6 | 4·8 | 5·1 | 5·3 | 5·5 | 5·7 | 5·9 | 6·2 | 6·4 | 6·6 | 6·8 | 7·0 | 7·3 | 7·5 | 7·7 | ·44 |
| ·42 | 2·5 | 2·7 | 2·9 | 3·1 | 3·4 | 3·6 | 3·8 | 4·0 | 4·2 | 4·4 | 4·6 | 4·8 | 5·0 | 5·2 | 5·5 | 5·7 | 5·9 | 6·1 | 6·3 | 6·5 | 6·7 | 6·9 | 7·1 | 7·3 | ·42 |
| ·40 | 2·4 | 2·6 | 2·8 | 3·0 | 3·2 | 3·4 | 3·6 | 3·8 | 4·0 | 4·2 | 4·4 | 4·6 | 4·8 | 5·0 | 5·2 | 5·4 | 5·6 | 5·8 | 6·0 | 6·2 | 6·4 | 6·6 | 6·8 | 7·0 | ·40 |
| ·38 | 2·3 | 2·5 | 2·7 | 2·8 | 3·0 | 3·2 | 3·4 | 3·6 | 3·8 | 4·0 | 4·2 | 4·4 | 4·6 | 4·7 | 4·9 | 5·1 | 5·3 | 5·5 | 5·7 | 5·9 | 6·1 | 6·3 | 6·5 | 6·6 | ·38 |
| ·36 | 2·2 | 2·3 | 2·5 | 2·7 | 2·9 | 3·1 | 3·2 | 3·4 | 3·6 | 3·8 | 4·0 | 4·1 | 4·3 | 4·5 | 4·7 | 4·9 | 5·0 | 5·2 | 5·4 | 5·6 | 5·8 | 5·9 | 6·1 | 6·3 | ·36 |
| ·34 | 2·0 | 2·2 | 2·4 | 2·5 | 2·7 | 2·9 | 3·1 | 3·2 | 3·4 | 3·6 | 3·7 | 3·9 | 4·1 | 4·2 | 4·4 | 4·6 | 4·8 | 4·9 | 5·1 | 5·3 | 5·4 | 5·6 | 5·8 | 5·9 | ·34 |
| ·32 | 1·9 | 2·1 | 2·2 | 2·4 | 2·6 | 2·7 | 2·9 | 3·0 | 3·2 | 3·4 | 3·5 | 3·7 | 3·8 | 4·0 | 4·2 | 4·3 | 4·5 | 4·6 | 4·8 | 5·0 | 5·1 | 5·3 | 5·4 | 5·6 | ·32 |
| ·30 | 1·8 | 1·9 | 2·1 | 2·2 | 2·4 | 2·5 | 2·7 | 2·8 | 3·0 | 3·1 | 3·3 | 3·4 | 3·6 | 3·7 | 3·9 | 4·0 | 4·2 | 4·3 | 4·5 | 4·6 | 4·8 | 4·9 | 5·1 | 5·2 | ·30 |
| ·28 | 1·7 | 1·8 | 2·0 | 2·1 | 2·2 | 2·4 | 2·5 | 2·7 | 2·8 | 2·9 | 3·1 | 3·2 | 3·4 | 3·5 | 3·6 | 3·8 | 3·9 | 4·1 | 4·2 | 4·3 | 4·5 | 4·6 | 4·8 | 4·9 | ·28 |
| ·26 | 1·6 | 1·7 | 1·8 | 1·9 | 2·1 | 2·2 | 2·3 | 2·5 | 2·6 | 2·7 | 2·9 | 3·0 | 3·1 | 3·2 | 3·4 | 3·5 | 3·6 | 3·8 | 3·9 | 4·0 | 4·2 | 4·3 | 4·4 | 4·5 | ·26 |
| ·24 | 1·4 | 1·6 | 1·7 | 1·8 | 1·9 | 2·0 | 2·2 | 2·3 | 2·4 | 2·5 | 2·6 | 2·8 | 2·9 | 3·0 | 3·1 | 3·2 | 3·4 | 3·5 | 3·6 | 3·7 | 3·8 | 4·0 | 4·1 | 4·2 | ·24 |
| ·22 | 1·3 | 1·4 | 1·5 | 1·6 | 1·8 | 1·9 | 2·0 | 2·1 | 2·2 | 2·3 | 2·4 | 2·5 | 2·6 | 2·7 | 2·9 | 3·0 | 3·1 | 3·2 | 3·3 | 3·4 | 3·5 | 3·6 | 3·7 | 3·8 | ·22 |
| ·20 | 1·2 | 1·3 | 1·4 | 1·5 | 1·6 | 1·7 | 1·8 | 1·9 | 2·0 | 2·1 | 2·2 | 2·3 | 2·4 | 2·5 | 2·6 | 2·7 | 2·8 | 2·9 | 3·0 | 3·1 | 3·2 | 3·3 | 3·4 | 3·5 | ·20 |
| ·18 | 1·1 | 1·2 | 1·3 | 1·3 | 1·4 | 1·5 | 1·6 | 1·7 | 1·8 | 1·9 | 2·0 | 2·1 | 2·2 | 2·2 | 2·3 | 2·4 | 2·5 | 2·6 | 2·7 | 2·8 | 2·9 | 3·0 | 3·1 | 3·1 | ·18 |
| ·16 | 1·0 | 1·0 | 1·1 | 1·2 | 1·3 | 1·4 | 1·4 | 1·5 | 1·6 | 1·7 | 1·8 | 1·8 | 1·9 | 2·0 | 2·1 | 2·2 | 2·2 | 2·3 | 2·4 | 2·5 | 2·6 | 2·6 | 2·7 | 2·8 | ·16 |
| ·14 | 0·8 | 0·9 | 1·0 | 1·0 | 1·1 | 1·2 | 1·3 | 1·3 | 1·4 | 1·5 | 1·5 | 1·6 | 1·7 | 1·7 | 1·8 | 1·9 | 2·0 | 2·0 | 2·1 | 2·2 | 2·2 | 2·3 | 2·4 | 2·4 | ·14 |
| ·12 | 0·7 | 0·8 | 0·8 | 0·9 | 1·0 | 1·0 | 1·1 | 1·1 | 1·2 | 1·3 | 1·3 | 1·4 | 1·4 | 1·5 | 1·6 | 1·6 | 1·7 | 1·7 | 1·8 | 1·9 | 1·9 | 2·0 | 2·0 | 2·1 | ·12 |
| ·10 | 0·6 | 0·6 | 0·7 | 0·7 | 0·8 | 0·8 | 0·9 | 0·9 | 1·0 | 1·0 | 1·1 | 1·1 | 1·2 | 1·2 | 1·3 | 1·3 | 1·4 | 1·4 | 1·5 | 1·5 | 1·6 | 1·6 | 1·7 | 1·7 | ·10 |
| ·08 | 0·5 | 0·5 | 0·6 | 0·6 | 0·6 | 0·7 | 0·7 | 0·8 | 0·8 | 0·8 | 0·9 | 0·9 | 1·0 | 1·0 | 1·0 | 1·1 | 1·1 | 1·2 | 1·2 | 1·2 | 1·3 | 1·3 | 1·4 | 1·4 | ·08 |
| ·06 | 0·4 | 0·4 | 0·4 | 0·4 | 0·5 | 0·5 | 0·5 | 0·6 | 0·6 | 0·6 | 0·7 | 0·7 | 0·7 | 0·7 | 0·8 | 0·8 | 0·8 | 0·9 | 0·9 | 0·9 | 1·0 | 1·0 | 1·0 | 1·0 | ·06 |
| ·04 | 0·2 | 0·3 | 0·3 | 0·3 | 0·3 | 0·4 | 0·4 | 0·4 | 0·4 | 0·5 | 0·5 | 0·5 | 0·5 | 0·5 | 0·5 | 0·6 | 0·6 | 0·6 | 0·6 | 0·6 | 0·7 | 0·7 | 0·7 | 0·7 | ·04 |
| ·02 | 0·1 | 0·1 | 0·1 | 0·1 | 0·2 | 0·2 | 0·2 | 0·2 | 0·2 | 0·2 | 0·2 | 0·2 | 0·2 | 0·2 | 0·3 | 0·3 | 0·3 | 0·3 | 0·3 | 0·3 | 0·3 | 0·3 | 0·3 | 0·3 | ·02 |

FACTOR

# TABLE III

## HEIGHT IN METRES OF CHART DATUM RELATIVE TO ORDNANCE DATUM IN THE UNITED KINGDOM

| No. | Place | Ordnance datum (local) | Ordnance datum (Newlyn) |
|---|---|---|---|
| 1 | St. Mary's | −2·91 | |
| 2 | Penzance (Newlyn) | | −3·05 |
| 2a | Porthleven | | −2·99 |
| 3 | Lizard Point | | −2·90 |
| 4 | Coverack | | −2·90 |
| 4a | Helford River (Entrance) | | −2·90 |
| 5 | Falmouth | | −2·91 |
| 5a | Truro | | −1·10 |
| 7 | Mevagissey | | −3·05 |
| 7a | Par | | −3·05 |
| 8 | Fowey | | −3·05 |
| 8a | Lostwithiel | | +0·85 |
| 11 | Looe | | −3·05 |
| 14 | **PLYMOUTH (DEVONPORT)** | | −3·22 |
| 14a | Saltash | | −3·22 |
| 14b | Cargreen | | −3·26 |
| 14c | Cotehele Quay | | −2·13 |
| 14e | Jupiter Point | | −3·22 |
| 14f | St. Germans | | −3·22 |
| 15 | Turnchapel | | −3·22 |
| 17 | River Yealm | | −3·05 |
| 20 | Salcombe | | −3·05 |
| 23 | Dartmouth | | −2·62 |
| 23a | Greenway Quay | | −2·62 |
| 23b | Totnes | | −1·20 |
| 25 | Torquay | | −2·80 |
| 26 | Teignmouth Approaches | | −2·65 |
| 26a | Teignmouth (Shaldon Bridge) | | −2·57 |
| 26b | Exmouth Approaches | | −2·44 |
| 27 | Exmouth Dock | | −1·83 |
| 27a | Starcross | | −1·83 |
| 27b | Topsham | | −1·75 |
| 28 | Lyme Regis | | −2·35 |
| 29 | Bridport | | −2·25 |
| 30 | Chesil Beach | | −2·10 |
| 33 | **PORTLAND** | | −0·93 |
| 34 | Lulworth Cove | | −1·02 |
| 35 | Swanage | | −1·40 |
| 36 | Poole (Entrance) | | −1·40 |
| 36a | Poole (Town Quay) | | −1·40 |
| 36b | Pottery Pier | | −1·40 |
| 36c | Wareham (R. Frome) | | −1·40 |
| 36d | Cleavel Point | | −1·40 |
| 37 | Bournemouth | | −1·40 |
| 38 | Christchurch (Entrance) | | −0·91 |
| 38a | Christchurch (Tuckton) | | −0·91 |
| 39 | Hurst Point | | −1·83 |
| 40 | Lymington | | −1·98 |
| 42 | Bucklers Hard | | −2·29 |
| 43 | Stansore Point | | −2·44 |
| 45 | Yarmouth, Isle of Wight | | −1·98 |
| 46 | Totland Bay | | −1·83 |
| 48 | Freshwater | | −1·83 |
| 51 | Ventnor | | −2·44 |
| 53 | Sandown | | −2·44 |
| 53a | Foreland Lifeboat Slip | | −2·74 |
| 54 | Bembridge Harbour | | −1·34 |
| 58 | Ryde | | −2·74 |
| 60 | Cowes | | −2·59 |
| 60a | Folly Inn | | −2·59 |
| 60b | Newport, Isle of Wight | | −2·59 |
| 61 | Calshot Castle | | −2·74 |
| 62 | **SOUTHAMPTON** | | −2·74 |
| 62a | Redbridge | | −2·74 |
| 63 | Warsash | | −2·74 |
| 63a | Bursledon | | −2·74 |
| 64 | Lee-on-the-Solent | | −2·74 |
| 65 | **PORTSMOUTH** | | −2·73 |
| 68 | Chichester Harbour (Entrance) | | −2·74 |
| 68a | Northney | | −2·74 |
| 68b | Bosham | | −2·74 |
| 68c | Itchenor | | −2·74 |
| 68d | Dell Quay | | −2·74 |
| 69 | Selsey Bill | | −2·90 |
| 72 | Pagham | | −3·05 |
| 73 | Bognor Regis | | −3·05 |
| 74 | Littlehampton (Entrance) | | −3·05 |
| 74a | Littlehampton (Norfolk Wharf) | | −2·74 |
| 75 | Worthing | | −3·20 |
| 81 | **SHOREHAM** | | −3·27 |
| 82 | Brighton | | −3·40 |
| 83 | Newhaven | | −3·52 |
| 84 | Eastbourne | | −3·65 |
| 85 | Hastings | | −3·80 |
| 86 | Rye Approaches | | −3·95 |
| 86a | Rye Harbour | | −1·55 |
| 87 | Dungeness | | −4·10 |
| 88 | Folkestone | | −3·75 |
| 89 | **DOVER** | | −3·67 |
| 98 | Deal | | −3·40 |
| 99 | Richborough | | −1·33 |
| 102 | Ramsgate | | −2·58 |
| 102a | Broadstairs | | −2·35 |
| 103 | **MARGATE** | | −2·50 |
| 104 | Herne Bay | | −2·72 |
| 105 | Whitstable | | −2·74 |
| 106 | Grovehurst Jetty | | −2·90 |
| 108 | **SHEERNESS** | | −2·90 |
| 108a | Bee Ness | | −2·80 |
| 108b | Bartlett Creek | | −2·80 |
| 108c | Darnett Ness | | −2·80 |
| 109 | Chatham | | −2·80 |
| 109a | Upnor | | −2·80 |
| 109b | Rochester | | −2·74 |
| 109c | Wouldham | | −2·11 |
| 109d | New Hythe | | −0·65 |
| 109e | Allington Lock | | −0·12 |
| 110 | Southend-on-Sea | | −2·90 |
| 110a | Thames Haven | | −3·05 |
| 111 | Tilbury | | −3·12 |
| 112 | Woolwich (Gallion's Point) | | −3·35 |
| 113 | **LONDON BRIDGE** | | −3·20 |
| 114 | Chelsea Bridge | | −2·44 |
| 115 | Barnes Bridge | | −1·37 |
| 116 | Richmond Lock | | −0·61 |
| 121a | Holliwell Point | | −2·75 |
| 121b | Rochford | | −0·40 |
| 122 | Burnham-on-Crouch | | −2·35 |
| 122a | North Fambridge | | −2·35 |
| 122b | Hullbridge | | −2·35 |
| 122c | Battlesbridge | | +0·50 |
| 123 | Bradwell-on-Sea | | −2·68 |
| 123a | Osea Island | | −2·63 |
| 123b | Maldon | | +0·11 |
| 126 | Brightlingsea | | −2·44 |
| 127 | Colchester | | −1·40 |

## TABLE III (*cont.*)

## HEIGHT IN METRES OF CHART DATUM RELATIVE TO ORDNANCE DATUM IN THE UNITED KINGDOM

| No. | Place | Ordnance datum (local) | Ordnance datum (Newlyn) |
|---|---|---|---|
| 336 | Mellon Charles | | −2·77 |
| 337 | Gairloch | | −2·70 |
| 338 | Shieldaig | | −2·84 |
| 338a | Applecross | | −2·90 |
| 339 | Plockton | | −3·15 |
| 341 | Broadford Bay | | −2·85 |
| 342 | Portree | | −2·63 |
| 343 | Loch Snizort | | −2·70 |
| 344 | Loch Dunvegan | | −2·63 |
| 345 | Loch Harport | | −2·60 |
| 349 | Kyle of Lochalsh | | −2·73 |
| 349a | Dornie Bridge | | −2·68 |
| 351 | Glenelg Bay | | −2·65 |
| 352 | Loch Hourn | | −2·65 |
| 353a | Mallaig | | −2·62 |
| 360 | Iona | | −1·82 |
| 362 | Ulva Sound | | −1·87 |
| 363 | Salen (Loch Sunart) | | −2·20 |
| 364 | Tobermory | | −2·39 |
| 364a | Salen (Sound of Mull) | | −2·12 |
| 365 | Loch Aline | | −2·10 |
| 367 | Corran | | −1·96 |
| 368 | Corpach | | −1·98 |
| 370 | Port Appin | | −1·95 |
| 371 | Dunstaffnage Bay | | −2·10 |
| 372 | **OBAN** | | −2·10 |
| 373 | Seil Sound | | −0·94 |
| 374 | Scalasaig | −1·95 | |
| 379 | Orsay | | −1·30 |
| 380 | Bruichladdich | | −1·15 |
| 381 | Port Ellen | | −0·19 |
| 382 | Port Askaig | | −1·04 |
| 383 | Craighouse | | −0·30 |
| 383a | Loch Melfort | | −1·60 |
| 384 | Loch Beag | | −0·87 |
| 387 | Carsaig Bay, Sound of Jura | | −0·61 |
| 389 | Sound of Gigha | | −0·60 |
| 390 | Machrihanish | | −0·66 |
| 391 | Southend, Kintyre | | −0·88 |
| 393 | Campbeltown | | −1·39 |
| 393a | Carradale | | −1·62 |
| 394 | East Loch Tarbert | | −1·62 |
| 395 | Inveraray | | −1·62 |
| 396 | Rubha Bodach | | −1·62 |
| 396a | Tighnabruich | | −1·62 |
| 398 | Millport | | −1·62 |
| 399 | Rothesay Bay | | −1·62 |
| 399a | Wemyss Bay | | −1·62 |
| 399b | Coulport | | −1·62 |
| 399c | Lochgoilhead | | −1·62 |
| 401 | Arrochar | | −1·62 |
| 402 | Rosneath | | −1·62 |
| 402a | Shandon | | −1·62 |
| 402b | Garelochhead | | −1·62 |
| 403 | Helensburgh | | −1·62 |
| 404 | **GREENOCK** | | −1·62 |
| 405 | Port Glasgow | | −1·62 |
| 406 | Bowling | | −2·00 |
| 406a | Renfrew | | −2·25 |
| 407 | Glasgow | | −2·50 |
| 408 | Brodick Bay | | −1·50 |
| 409 | Lamlash | | −1·50 |
| 410 | Ardrossan | | −1·60 |
| 411 | Irvine | | −1·60 |
| 412 | Troon | | −1·60 |
| 413 | Ayr | | −1·50 |
| 414 | Girvan | | −1·40 |
| 414a | Stranraer | | −1·40 |
| 415 | Portpatrick | | −1·80 |
| 420 | Drummore | | −3·10 |
| 420a | Port William | | −3·60 |
| 421 | Isle of Whithorn | | −3·80 |
| 422 | Garlieston | | −3·80 |
| 422a | Kirkcudbright Bay | | −3·70 |
| 424 | Hestan Islet | | −4·01 |
| 426 | Annan Waterfoot | | −2·10 |
| 430 | Torduff Point | | +0·24 |
| 431 | Redkirk | | +1·71 |
| 432 | Silloth | | −4·40 |
| 433 | Maryport | | −4·30 |
| 434 | Workington | | −4·20 |
| 435 | Whitehaven | | −4·20 |
| 439 | Barrow Docks | | −4·75 |
| 439a | Roa Island | | −4·75 |
| 439b | Haws Point | | −4·70 |
| 440 | Ulverston | | −4·70 |
| 440a | Arnside | | −4·90 |
| 440b | Morecambe | | −4·90 |
| 441 | Heysham | | −4·90 |
| 442 | Glasson Dock | | −2·00 |
| 442a | Lancaster | | +0·55 |
| 444 | Fleetwood | | −4·90 |
| 445 | Blackpool | | −4·90 |
| 446 | Preston | | −0·90 |
| 447 | Southport | | −4·90 |
| 448 | Formby | | −4·93 |
| 450 | Rock Channel | | −4·93 |
| 451 | New Brighton | | −4·93 |
| 452 | **LIVERPOOL** | | −4·93 |
| 453 | Eastham | | −4·93 |
| 455 | Hale Head | | −2·00 |
| 456 | Widnes | | 0·00 |
| 456a | Fiddler's Ferry | | +2·00 |
| 461 | Hilbre Island | | −4·93 |
| 462 | Mostyn Quay | | −4·50 |
| 463 | Connah's Quay | | −0·75 |
| 464 | Chester | | +0·60 |
| 466 | Peel | −2·75 | |
| 467 | Ramsey | −3·74 | |
| 468 | Douglas | −3·70 | |
| 470 | Colwyn Bay | | −4·10 |
| 471 | Llandudno | | −3·85 |
| 471a | Conwy | | −4·00 |
| 472 | Beaumaris | | −4·00 |
| 473 | Menai Bridge | | −3·80 |
| 474 | Port Dinorwic | | −3·05 |
| 475 | Caernarfon | | −2·80 |
| 475a | Fort Belan | | −2·60 |
| 476 | Trwyn Dinmor | | −4·00 |
| 476a | Moelfre | | −4·00 |
| 477 | Amlwch | | −3·90 |
| 477a | Cemaes Bay | | −3·60 |
| 478 | **HOLYHEAD** | | −3·05 |
| 479 | Trearddur Bay | | −2·90 |
| 479a | Porth Trecastell | | −2·80 |
| 480 | Llanddwyn Island | | −2·79 |
| 480a | Trefor | | −2·50 |

# TABLE VII

## TIDAL ANGLES AND FACTORS

The accompanying annual tables are for use with the Simplified Harmonic Tidal Prediction Form N.P.159 (see also pages xxvi to xxviii) and with the analysis of 24 hourly heights or rates at hourly intervals (N.P.171).

The data are given for 0000 on each day.

The table gives values of the Tidal Angles in degrees and the Factors for $M_2$, $S_2$, $K_1$ and $O_1$ which are amended to include the effects of $2N_2$, $\mu_2$, $N_2$, $\nu_2$, $\lambda_2$, $L_2$, $T_2$, $K_2$, $2Q_1$, $\sigma_1$, $Q_1$, $\rho_1$, $\pi_1$, $P_1$, $\phi_1$, and $J_1$. It is assumed the relationships from tidal theory between these minor constituents and the four major constituents hold good.

Note.—On the first of above-mentioned forms the Tidal Angles are adjusted to 1200 by the inclusion of the angle $\alpha$ in the Table on Form A. The speed of the semi-diurnal tide is assumed to be 29° per hour (the speed of $M_2$), and that of the diurnal 14·5° per hour. Because of this assumption, predictions computed from these tables will be correct at 1200 but in error before and subsequently, the error getting progressively larger further from 1200. Depending on the state and character of the tide, this error can be assumed to be not greater than about one minute per hour.

# TABLE VII TIDAL ANGLES AND FACTORS YEAR 1992

## JANUARY

| | M2 | | S2 | | K1 | | O1 | |
|---|---|---|---|---|---|---|---|---|
| DAY | A | F | A | F | A | F | A | F |
| 1 | 272 | 0.94 | 012 | 0.84 | 347 | 1.31 | 290 | 0.93 |
| 2 | 295 | 0.91 | 012 | 0.85 | 347 | 1.29 | 314 | 0.91 |
| 3 | 317 | 0.89 | 013 | 0.86 | 347 | 1.28 | 337 | 0.89 |
| 4 | 339 | 0.88 | 013 | 0.87 | 347 | 1.27 | 001 | 0.88 |
| 5 | 001 | 0.87 | 014 | 0.88 | 347 | 1.26 | 024 | 0.88 |
| 6 | 023 | 0.87 | 014 | 0.89 | 347 | 1.26 | 048 | 0.87 |
| 7 | 045 | 0.86 | 014 | 0.90 | 347 | 1.25 | 071 | 0.87 |
| 8 | 067 | 0.86 | 015 | 0.91 | 347 | 1.26 | 094 | 0.87 |
| 9 | 089 | 0.86 | 015 | 0.91 | 347 | 1.26 | 117 | 0.88 |
| 10 | 110 | 0.86 | 015 | 0.92 | 347 | 1.27 | 140 | 0.90 |
| 11 | 132 | 0.87 | 015 | 0.93 | 346 | 1.27 | 163 | 0.93 |
| 12 | 154 | 0.89 | 016 | 0.94 | 346 | 1.28 | 187 | 0.97 |
| 13 | 176 | 0.92 | 016 | 0.95 | 345 | 1.28 | 211 | 1.03 |
| 14 | 200 | 0.97 | 016 | 0.96 | 345 | 1.29 | 237 | 1.09 |
| 15 | 224 | 1.02 | 016 | 0.97 | 344 | 1.29 | 263 | 1.16 |
| 16 | 249 | 1.07 | 016 | 0.98 | 343 | 1.29 | 290 | 1.22 |
| 17 | 276 | 1.12 | 017 | 0.99 | 341 | 1.29 | 318 | 1.28 |
| 18 | 303 | 1.17 | 017 | 1.00 | 340 | 1.28 | 346 | 1.32 |
| 19 | 330 | 1.20 | 017 | 1.01 | 339 | 1.28 | 014 | 1.34 |
| 20 | 358 | 1.23 | 017 | 1.02 | 338 | 1.26 | 043 | 1.35 |
| 21 | 026 | 1.24 | 017 | 1.03 | 337 | 1.25 | 072 | 1.34 |
| 22 | 055 | 1.24 | 017 | 1.04 | 336 | 1.23 | 100 | 1.31 |
| 23 | 082 | 1.22 | 017 | 1.05 | 335 | 1.21 | 128 | 1.26 |
| 24 | 110 | 1.19 | 017 | 1.06 | 334 | 1.19 | 156 | 1.21 |
| 25 | 137 | 1.14 | 017 | 1.07 | 333 | 1.16 | 183 | 1.14 |
| 26 | 163 | 1.09 | 017 | 1.08 | 332 | 1.14 | 209 | 1.08 |
| 27 | 188 | 1.04 | 017 | 1.09 | 331 | 1.11 | 234 | 1.02 |
| 28 | 213 | 0.99 | 016 | 1.10 | 331 | 1.09 | 258 | 0.96 |
| 29 | 236 | 0.94 | 016 | 1.11 | 331 | 1.07 | 282 | 0.92 |
| 30 | 258 | 0.91 | 016 | 1.12 | 331 | 1.05 | 305 | 0.89 |
| 31 | 280 | 0.88 | 016 | 1.13 | 331 | 1.04 | 328 | 0.88 |

## FEBRUARY

| | M2 | | S2 | | K1 | | O1 | |
|---|---|---|---|---|---|---|---|---|
| DAY | A | F | A | F | A | F | A | F |
| 1 | 302 | 0.87 | 016 | 1.14 | 331 | 1.02 | 351 | 0.87 |
| 2 | 323 | 0.86 | 016 | 1.15 | 331 | 1.01 | 014 | 0.87 |
| 3 | 345 | 0.86 | 016 | 1.15 | 330 | 1.01 | 038 | 0.87 |
| 4 | 007 | 0.86 | 015 | 1.16 | 330 | 1.00 | 061 | 0.87 |
| 5 | 029 | 0.86 | 015 | 1.17 | 330 | 1.00 | 085 | 0.88 |
| 6 | 051 | 0.86 | 015 | 1.18 | 329 | 1.00 | 108 | 0.89 |
| 7 | 074 | 0.87 | 015 | 1.19 | 329 | 1.00 | 131 | 0.90 |
| 8 | 096 | 0.88 | 015 | 1.19 | 328 | 1.01 | 155 | 0.93 |
| 9 | 118 | 0.90 | 014 | 1.20 | 327 | 1.01 | 178 | 0.97 |
| 10 | 140 | 0.92 | 014 | 1.21 | 325 | 1.01 | 203 | 1.02 |
| 11 | 164 | 0.96 | 014 | 1.22 | 324 | 1.01 | 228 | 1.07 |
| 12 | 188 | 1.01 | 013 | 1.22 | 322 | 1.00 | 254 | 1.13 |
| 13 | 213 | 1.05 | 013 | 1.23 | 321 | 1.00 | 280 | 1.19 |
| 14 | 239 | 1.10 | 013 | 1.24 | 319 | 0.99 | 308 | 1.24 |
| 15 | 265 | 1.15 | 013 | 1.24 | 317 | 0.98 | 336 | 1.29 |
| 16 | 292 | 1.19 | 012 | 1.25 | 315 | 0.96 | 004 | 1.32 |
| 17 | 320 | 1.21 | 012 | 1.25 | 313 | 0.95 | 033 | 1.33 |
| 18 | 348 | 1.23 | 012 | 1.26 | 311 | 0.93 | 061 | 1.32 |
| 19 | 016 | 1.23 | 011 | 1.26 | 309 | 0.91 | 090 | 1.30 |
| 20 | 044 | 1.21 | 011 | 1.27 | 308 | 0.89 | 118 | 1.26 |
| 21 | 071 | 1.19 | 011 | 1.27 | 306 | 0.86 | 145 | 1.21 |
| 22 | 098 | 1.15 | 010 | 1.28 | 305 | 0.84 | 172 | 1.15 |
| 23 | 125 | 1.10 | 010 | 1.28 | 303 | 0.82 | 199 | 1.09 |
| 24 | 150 | 1.05 | 010 | 1.29 | 302 | 0.79 | 224 | 1.03 |
| 25 | 175 | 1.00 | 009 | 1.29 | 301 | 0.77 | 249 | 0.97 |
| 26 | 198 | 0.95 | 009 | 1.29 | 300 | 0.75 | 272 | 0.92 |
| 27 | 221 | 0.91 | 009 | 1.30 | 299 | 0.74 | 295 | 0.89 |
| 28 | 243 | 0.88 | 008 | 1.30 | 299 | 0.72 | 318 | 0.87 |
| 29 | 264 | 0.86 | 008 | 1.30 | 298 | 0.71 | 341 | 0.87 |

## MARCH

| | M2 | | S2 | | K1 | | O1 | |
|---|---|---|---|---|---|---|---|---|
| DAY | A | F | A | F | A | F | A | F |
| 1 | 286 | 0.86 | 007 | 1.30 | 298 | 0.71 | 004 | 0.87 |
| 2 | 307 | 0.86 | 007 | 1.31 | 297 | 0.71 | 027 | 0.87 |
| 3 | 329 | 0.86 | 007 | 1.31 | 296 | 0.71 | 051 | 0.88 |
| 4 | 351 | 0.87 | 006 | 1.31 | 295 | 0.71 | 075 | 0.89 |
| 5 | 014 | 0.88 | 006 | 1.31 | 294 | 0.71 | 098 | 0.91 |
| 6 | 036 | 0.89 | 005 | 1.31 | 292 | 0.72 | 122 | 0.93 |
| 7 | 059 | 0.90 | 005 | 1.31 | 290 | 0.73 | 146 | 0.95 |
| 8 | 082 | 0.92 | 005 | 1.31 | 288 | 0.73 | 171 | 0.98 |
| 9 | 105 | 0.94 | 004 | 1.31 | 286 | 0.74 | 195 | 1.02 |
| 10 | 129 | 0.97 | 004 | 1.31 | 284 | 0.75 | 220 | 1.07 |
| 11 | 153 | 1.01 | 003 | 1.31 | 281 | 0.75 | 246 | 1.11 |
| 12 | 178 | 1.05 | 003 | 1.31 | 278 | 0.76 | 273 | 1.16 |
| 13 | 203 | 1.08 | 003 | 1.31 | 276 | 0.76 | 300 | 1.20 |
| 14 | 230 | 1.12 | 002 | 1.31 | 273 | 0.76 | 327 | 1.24 |
| 15 | 256 | 1.15 | 002 | 1.30 | 270 | 0.76 | 355 | 1.26 |
| 16 | 283 | 1.18 | 001 | 1.30 | 267 | 0.76 | 023 | 1.28 |
| 17 | 311 | 1.19 | 001 | 1.30 | 264 | 0.75 | 051 | 1.27 |
| 18 | 338 | 1.19 | 000 | 1.30 | 261 | 0.75 | 079 | 1.26 |
| 19 | 006 | 1.18 | 000 | 1.30 | 259 | 0.74 | 107 | 1.23 |
| 20 | 033 | 1.16 | 000 | 1.29 | 256 | 0.73 | 134 | 1.18 |
| 21 | 059 | 1.13 | 359 | 1.29 | 254 | 0.72 | 161 | 1.13 |
| 22 | 085 | 1.09 | 359 | 1.29 | 252 | 0.72 | 187 | 1.08 |
| 23 | 111 | 1.05 | 358 | 1.28 | 250 | 0.71 | 213 | 1.02 |
| 24 | 135 | 1.00 | 358 | 1.28 | 248 | 0.70 | 238 | 0.97 |
| 25 | 159 | 0.95 | 358 | 1.27 | 247 | 0.69 | 261 | 0.93 |
| 26 | 182 | 0.92 | 357 | 1.27 | 246 | 0.69 | 285 | 0.90 |
| 27 | 204 | 0.89 | 357 | 1.26 | 245 | 0.69 | 308 | 0.88 |
| 28 | 226 | 0.87 | 356 | 1.26 | 244 | 0.69 | 330 | 0.87 |
| 29 | 247 | 0.86 | 356 | 1.25 | 243 | 0.69 | 353 | 0.87 |
| 30 | 269 | 0.86 | 356 | 1.25 | 243 | 0.70 | 016 | 0.88 |
| 31 | 291 | 0.87 | 355 | 1.24 | 242 | 0.71 | 040 | 0.90 |

## APRIL

| | M2 | | S2 | | K1 | | O1 | |
|---|---|---|---|---|---|---|---|---|
| DAY | A | F | A | F | A | F | A | F |
| 1 | 313 | 0.88 | 355 | 1.24 | 241 | 0.73 | 064 | 0.92 |
| 2 | 335 | 0.89 | 354 | 1.23 | 240 | 0.74 | 088 | 0.94 |
| 3 | 358 | 0.91 | 354 | 1.22 | 239 | 0.76 | 113 | 0.97 |
| 4 | 022 | 0.93 | 354 | 1.22 | 238 | 0.78 | 137 | 0.99 |
| 5 | 045 | 0.96 | 353 | 1.21 | 237 | 0.80 | 162 | 1.02 |
| 6 | 069 | 0.98 | 353 | 1.20 | 235 | 0.83 | 188 | 1.06 |
| 7 | 094 | 1.01 | 353 | 1.19 | 233 | 0.85 | 213 | 1.09 |
| 8 | 119 | 1.03 | 352 | 1.19 | 232 | 0.87 | 240 | 1.12 |
| 9 | 144 | 1.06 | 352 | 1.18 | 230 | 0.89 | 266 | 1.15 |
| 10 | 170 | 1.09 | 352 | 1.17 | 228 | 0.91 | 293 | 1.18 |
| 11 | 196 | 1.11 | 351 | 1.16 | 226 | 0.92 | 320 | 1.20 |
| 12 | 222 | 1.13 | 351 | 1.15 | 224 | 0.94 | 347 | 1.21 |
| 13 | 249 | 1.14 | 351 | 1.15 | 222 | 0.95 | 015 | 1.22 |
| 14 | 275 | 1.15 | 350 | 1.14 | 220 | 0.96 | 042 | 1.21 |
| 15 | 302 | 1.15 | 350 | 1.13 | 218 | 0.96 | 069 | 1.19 |
| 16 | 329 | 1.14 | 350 | 1.12 | 216 | 0.97 | 097 | 1.17 |
| 17 | 355 | 1.12 | 349 | 1.11 | 214 | 0.97 | 124 | 1.13 |
| 18 | 021 | 1.09 | 349 | 1.10 | 213 | 0.97 | 150 | 1.09 |
| 19 | 046 | 1.06 | 349 | 1.09 | 212 | 0.97 | 176 | 1.05 |
| 20 | 071 | 1.02 | 349 | 1.08 | 211 | 0.96 | 201 | 1.00 |
| 21 | 096 | 0.99 | 348 | 1.07 | 210 | 0.96 | 226 | 0.96 |
| 22 | 119 | 0.95 | 348 | 1.06 | 209 | 0.96 | 250 | 0.93 |
| 23 | 142 | 0.92 | 348 | 1.05 | 209 | 0.96 | 274 | 0.90 |
| 24 | 165 | 0.89 | 348 | 1.04 | 208 | 0.96 | 297 | 0.88 |
| 25 | 186 | 0.87 | 347 | 1.03 | 208 | 0.96 | 319 | 0.87 |
| 26 | 208 | 0.86 | 347 | 1.02 | 208 | 0.97 | 342 | 0.87 |
| 27 | 230 | 0.86 | 347 | 1.01 | 208 | 0.98 | 005 | 0.88 |
| 28 | 251 | 0.87 | 347 | 1.00 | 208 | 1.00 | 029 | 0.91 |
| 29 | 274 | 0.88 | 347 | 0.99 | 207 | 1.01 | 052 | 0.93 |
| 30 | 296 | 0.91 | 347 | 0.98 | 207 | 1.03 | 077 | 0.97 |

# TABLE VIII

## ASTRONOMICAL ARGUMENTS

The accompanying annual tables are for use with the Harmonic Analyses of 30 days tidal observation on Form N.P.112 (Explanation and instructions in N.P.122(1)).

The tables give the daily values at 0000 of $E_0+u$ in degrees for 13 constituents.

Monthly values of "f" for the middle of each month for the main constituents are shown in the table below.

YEAR 1992

| | JAN. | FEB. | MAR. | APR. | MAY. | JUN. | JUL. | AUG. | SEP. | OCT. | NOV. | DEC. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MM | 0.98 | 0.98 | 0.99 | 0.99 | 0.99 | 1.00 | 1.00 | 1.00 | 1.01 | 1.01 | 1.01 | 1.02 |
| Q1 O1 | 1.05 | 1.05 | 1.04 | 1.04 | 1.03 | 1.03 | 1.02 | 1.02 | 1.01 | 1.01 | 1.00 | 1.00 |
| M1 | 1.57 | 1.63 | 1.68 | 1.72 | 1.77 | 1.81 | 1.84 | 1.87 | 1.90 | 1.92 | 1.94 | 1.95 |
| K1 | 1.03 | 1.03 | 1.03 | 1.02 | 1.02 | 1.02 | 1.01 | 1.01 | 1.01 | 1.00 | 1.00 | 1.00 |
| J1 | 1.05 | 1.05 | 1.05 | 1.04 | 1.04 | 1.03 | 1.03 | 1.02 | 1.02 | 1.01 | 1.01 | 1.01 |
| MU2 N2 M2 | 0.99 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.01 |
| L2 | 1.08 | 1.04 | 1.01 | 0.98 | 0.95 | 0.92 | 0.89 | 0.87 | 0.84 | 0.82 | 0.81 | 0.79 |
| K2 | 1.06 | 1.05 | 1.05 | 1.04 | 1.03 | 1.02 | 1.01 | 1.01 | 1.00 | 0.99 | 0.98 | 0.97 |
| M3 | 0.99 | 0.99 | 0.99 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.01 | 1.01 | 1.01 |

Values of the remaining constituents required for the 30 day analysis can be obtained from the following relationships:

| Constituent | $(E+u)$ | f |
|---|---|---|
| MSf | $360-(E+u)$ of $M_2$ | f of $M_2$ |
| $P_1$ | See Table | Always 1·00 |
| $2N_2$ | $2\times(E+u)$ of $N_2-(E+u)$ of $M_2$ | f of $M_2$ |
| $S_2$ | Always 360 degrees | Always 1·00 |
| $MO_3$ | $(E+u)$ of $M_2+(E+u)$ of $O_1$ | (f of $M_2$)$\times$(f of $O_1$) |
| $MK_3$ | $(E+u)$ of $M_2+(E+u)$ of $K_1$ | (f of $M_2$)$\times$(f of $K_1$) |
| $MN_4$ | $(E+u)$ of $M_2+(E+u)$ of $N_2$ | (f of $M_2$) Squared |
| $M_4$ | $2\times(E+u)$ of $M_2$ | (f of $M_2$) Squared |
| $SN_4$ | $(E+u)$ of $N_2$ | f of $M_2$ |
| $MS_4$ | $(E+u)$ of $M_2$ | f of $M_2$ |
| $2MN_6$ | $2\times(E+u)$ of $M_2+(E+u)$ of $N_2$ | (f of $M_2$) Cubed |
| $M_6$ | $3\times(E+u)$ of $M_2$ | (f of $M_2$) Cubed |
| $2MS_6$ | $2\times(E+u)$ of $M_2$ | (f of $M_2$) Squared |

# TABLE VIII ASTRONOMICAL ARGUMENTS YEAR 1992

## JANUARY

| DAY | MM | Q1 | O1 | M1 | P1 | K1 | J1 | MU2 | N2 | M2 | L2 | K2 | M3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 113 | 327 | 079 | 288 | 350 | 018 | 135 | 201 | 349 | 101 | 048 | 217 | 332 |
| 2 | 126 | 288 | 054 | 275 | 349 | 019 | 149 | 152 | 311 | 077 | 037 | 219 | 295 |
| 3 | 139 | 250 | 029 | 263 | 348 | 020 | 163 | 103 | 274 | 053 | 026 | 221 | 259 |
| 4 | 152 | 211 | 003 | 251 | 347 | 021 | 177 | 054 | 236 | 028 | 014 | 223 | 222 |
| 5 | 165 | 173 | 338 | 239 | 346 | 022 | 191 | 006 | 199 | 004 | 003 | 225 | 186 |
| 6 | 178 | 135 | 312 | 227 | 345 | 023 | 205 | 317 | 162 | 339 | 352 | 227 | 149 |
| 7 | 191 | 096 | 287 | 215 | 344 | 024 | 219 | 268 | 124 | 315 | 341 | 229 | 113 |
| 8 | 204 | 058 | 262 | 203 | 343 | 025 | 233 | 219 | 087 | 291 | 329 | 231 | 076 |
| 9 | 217 | 019 | 236 | 191 | 342 | 026 | 247 | 170 | 049 | 266 | 318 | 233 | 039 |
| 10 | 230 | 341 | 211 | 179 | 341 | 027 | 261 | 122 | 012 | 242 | 307 | 235 | 003 |
| 11 | 243 | 302 | 186 | 167 | 340 | 028 | 275 | 073 | 334 | 218 | 295 | 237 | 326 |
| 12 | 256 | 264 | 160 | 155 | 339 | 029 | 289 | 024 | 297 | 193 | 284 | 239 | 290 |
| 13 | 269 | 226 | 135 | 142 | 338 | 030 | 303 | 335 | 259 | 169 | 273 | 241 | 253 |
| 14 | 282 | 187 | 109 | 130 | 337 | 031 | 317 | 287 | 222 | 144 | 261 | 243 | 217 |
| 15 | 295 | 149 | 084 | 118 | 336 | 032 | 331 | 238 | 185 | 120 | 250 | 245 | 180 |
| 16 | 308 | 110 | 059 | 106 | 335 | 033 | 345 | 189 | 147 | 096 | 239 | 247 | 143 |
| 17 | 322 | 072 | 033 | 094 | 334 | 034 | 359 | 140 | 110 | 071 | 228 | 249 | 107 |
| 18 | 335 | 033 | 008 | 082 | 333 | 035 | 013 | 092 | 072 | 047 | 216 | 251 | 070 |
| 19 | 348 | 355 | 343 | 070 | 332 | 036 | 028 | 043 | 035 | 022 | 205 | 253 | 034 |
| 20 | 001 | 316 | 317 | 058 | 331 | 037 | 042 | 354 | 357 | 358 | 194 | 255 | 357 |
| 21 | 014 | 278 | 292 | 046 | 330 | 038 | 056 | 305 | 320 | 334 | 182 | 257 | 321 |
| 22 | 027 | 240 | 267 | 034 | 329 | 039 | 070 | 257 | 282 | 309 | 171 | 259 | 284 |
| 23 | 040 | 201 | 241 | 022 | 328 | 040 | 084 | 208 | 245 | 285 | 160 | 260 | 247 |
| 24 | 053 | 163 | 216 | 010 | 327 | 041 | 098 | 159 | 208 | 261 | 148 | 262 | 211 |
| 25 | 066 | 124 | 190 | 357 | 326 | 042 | 112 | 110 | 170 | 236 | 137 | 264 | 174 |
| 26 | 079 | 086 | 165 | 345 | 325 | 043 | 126 | 061 | 133 | 212 | 126 | 266 | 138 |
| 27 | 092 | 047 | 140 | 333 | 324 | 044 | 140 | 013 | 095 | 187 | 115 | 268 | 101 |
| 28 | 105 | 009 | 114 | 321 | 323 | 045 | 154 | 324 | 058 | 163 | 103 | 270 | 065 |
| 29 | 118 | 331 | 089 | 309 | 322 | 046 | 168 | 275 | 020 | 139 | 092 | 272 | 028 |
| 30 | 131 | 292 | 064 | 297 | 322 | 047 | 182 | 226 | 343 | 114 | 081 | 274 | 351 |
| 31 | 144 | 254 | 038 | 285 | 321 | 048 | 196 | 178 | 305 | 090 | 069 | 276 | 315 |

## FEBRUARY

| DAY | MM | Q1 | O1 | M1 | P1 | K1 | J1 | MU2 | N2 | M2 | L2 | K2 | M3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 158 | 215 | 013 | 273 | 320 | 049 | 210 | 129 | 268 | 066 | 058 | 278 | 278 |
| 2 | 171 | 177 | 347 | 261 | 319 | 050 | 224 | 080 | 231 | 041 | 047 | 280 | 242 |
| 3 | 184 | 138 | 322 | 249 | 318 | 051 | 238 | 031 | 193 | 017 | 035 | 282 | 205 |
| 4 | 197 | 100 | 297 | 236 | 317 | 052 | 252 | 343 | 156 | 352 | 024 | 284 | 169 |
| 5 | 210 | 062 | 271 | 224 | 316 | 053 | 266 | 294 | 118 | 328 | 013 | 286 | 132 |
| 6 | 223 | 023 | 246 | 212 | 315 | 054 | 281 | 245 | 081 | 304 | 002 | 288 | 095 |
| 7 | 236 | 345 | 221 | 200 | 314 | 055 | 295 | 196 | 043 | 279 | 350 | 290 | 059 |
| 8 | 249 | 306 | 195 | 188 | 313 | 056 | 309 | 148 | 006 | 255 | 339 | 292 | 022 |
| 9 | 262 | 268 | 170 | 176 | 312 | 057 | 323 | 099 | 328 | 230 | 328 | 294 | 346 |
| 10 | 275 | 229 | 144 | 164 | 311 | 058 | 337 | 050 | 291 | 206 | 316 | 296 | 309 |
| 11 | 288 | 191 | 119 | 152 | 310 | 059 | 351 | 001 | 254 | 182 | 305 | 298 | 273 |
| 12 | 301 | 152 | 094 | 140 | 309 | 060 | 005 | 313 | 216 | 157 | 294 | 300 | 236 |
| 13 | 314 | 114 | 068 | 128 | 308 | 061 | 019 | 264 | 179 | 133 | 282 | 302 | 199 |
| 14 | 327 | 076 | 043 | 116 | 307 | 062 | 033 | 215 | 141 | 109 | 271 | 304 | 163 |
| 15 | 340 | 037 | 018 | 103 | 306 | 063 | 047 | 166 | 104 | 084 | 260 | 306 | 126 |
| 16 | 354 | 359 | 352 | 091 | 305 | 064 | 061 | 117 | 066 | 060 | 249 | 308 | 090 |
| 17 | 007 | 320 | 327 | 079 | 304 | 065 | 075 | 069 | 029 | 035 | 237 | 310 | 053 |
| 18 | 020 | 282 | 301 | 067 | 303 | 066 | 089 | 020 | 351 | 011 | 226 | 312 | 017 |
| 19 | 033 | 243 | 276 | 055 | 302 | 067 | 103 | 331 | 314 | 347 | 215 | 314 | 340 |
| 20 | 046 | 205 | 251 | 043 | 301 | 068 | 117 | 282 | 277 | 322 | 203 | 316 | 303 |
| 21 | 059 | 167 | 225 | 031 | 300 | 069 | 131 | 234 | 239 | 298 | 192 | 318 | 267 |
| 22 | 072 | 128 | 200 | 019 | 299 | 070 | 145 | 185 | 202 | 274 | 181 | 320 | 230 |
| 23 | 085 | 090 | 175 | 007 | 298 | 071 | 159 | 136 | 164 | 249 | 169 | 322 | 194 |
| 24 | 098 | 051 | 149 | 355 | 297 | 072 | 174 | 087 | 127 | 225 | 158 | 324 | 157 |
| 25 | 111 | 013 | 124 | 342 | 296 | 073 | 188 | 039 | 089 | 200 | 147 | 326 | 121 |
| 26 | 124 | 334 | 099 | 330 | 295 | 074 | 202 | 350 | 052 | 176 | 135 | 328 | 084 |
| 27 | 137 | 296 | 073 | 318 | 294 | 075 | 216 | 301 | 014 | 152 | 124 | 330 | 047 |
| 28 | 150 | 257 | 048 | 306 | 293 | 076 | 230 | 252 | 337 | 127 | 113 | 332 | 011 |
| 29 | 163 | 219 | 022 | 294 | 292 | 077 | 244 | 204 | 299 | 103 | 102 | 334 | 334 |

## MARCH

| DAY | MM | Q1 | O1 | M1 | P1 | K1 | J1 | MU2 | N2 | M2 | L2 | K2 | M3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 176 | 181 | 357 | 282 | 291 | 078 | 258 | 155 | 262 | 078 | 090 | 336 | 298 |
| 2 | 189 | 142 | 332 | 270 | 290 | 079 | 272 | 106 | 225 | 054 | 079 | 338 | 261 |
| 3 | 203 | 104 | 306 | 258 | 289 | 080 | 286 | 057 | 187 | 030 | 068 | 339 | 225 |
| 4 | 216 | 065 | 281 | 246 | 288 | 081 | 300 | 009 | 150 | 005 | 056 | 341 | 188 |
| 5 | 229 | 027 | 256 | 234 | 287 | 082 | 314 | 320 | 112 | 341 | 045 | 343 | 151 |
| 6 | 242 | 348 | 230 | 221 | 286 | 083 | 328 | 271 | 075 | 317 | 034 | 345 | 115 |
| 7 | 255 | 310 | 205 | 209 | 285 | 084 | 342 | 222 | 037 | 292 | 022 | 347 | 078 |
| 8 | 268 | 272 | 179 | 197 | 284 | 085 | 356 | 173 | 360 | 268 | 011 | 349 | 042 |
| 9 | 281 | 233 | 154 | 185 | 283 | 086 | 010 | 125 | 322 | 243 | 360 | 351 | 005 |
| 10 | 294 | 195 | 129 | 173 | 282 | 087 | 024 | 076 | 285 | 219 | 348 | 353 | 329 |
| 11 | 307 | 156 | 103 | 161 | 281 | 088 | 038 | 027 | 248 | 195 | 337 | 355 | 292 |
| 12 | 320 | 118 | 078 | 149 | 280 | 088 | 052 | 338 | 210 | 170 | 326 | 357 | 255 |
| 13 | 333 | 079 | 053 | 137 | 279 | 089 | 066 | 290 | 173 | 146 | 315 | 359 | 219 |
| 14 | 346 | 041 | 027 | 125 | 278 | 090 | 081 | 241 | 135 | 122 | 303 | 001 | 182 |
| 15 | 359 | 003 | 002 | 113 | 277 | 091 | 095 | 192 | 098 | 097 | 292 | 003 | 146 |
| 16 | 012 | 324 | 336 | 100 | 276 | 092 | 109 | 143 | 060 | 073 | 281 | 005 | 109 |
| 17 | 025 | 286 | 311 | 088 | 275 | 093 | 123 | 095 | 023 | 048 | 269 | 007 | 073 |
| 18 | 039 | 247 | 286 | 076 | 274 | 094 | 137 | 046 | 345 | 024 | 258 | 009 | 036 |
| 19 | 052 | 209 | 260 | 064 | 273 | 095 | 151 | 357 | 308 | 360 | 247 | 011 | 359 |
| 20 | 065 | 170 | 235 | 052 | 272 | 096 | 165 | 308 | 271 | 335 | 235 | 013 | 323 |
| 21 | 078 | 132 | 210 | 040 | 271 | 097 | 179 | 260 | 233 | 311 | 224 | 015 | 286 |
| 22 | 091 | 093 | 184 | 028 | 270 | 098 | 193 | 211 | 196 | 286 | 213 | 017 | 250 |
| 23 | 104 | 055 | 159 | 016 | 269 | 099 | 207 | 162 | 158 | 262 | 201 | 019 | 213 |
| 24 | 117 | 017 | 134 | 004 | 268 | 100 | 221 | 113 | 121 | 238 | 190 | 021 | 177 |
| 25 | 130 | 338 | 108 | 352 | 267 | 101 | 235 | 064 | 083 | 213 | 179 | 023 | 140 |
| 26 | 143 | 300 | 083 | 339 | 266 | 102 | 249 | 016 | 046 | 189 | 167 | 025 | 103 |
| 27 | 156 | 261 | 057 | 327 | 265 | 103 | 263 | 327 | 008 | 165 | 156 | 027 | 067 |
| 28 | 169 | 223 | 032 | 315 | 264 | 104 | 277 | 278 | 331 | 140 | 145 | 029 | 030 |
| 29 | 182 | 184 | 007 | 303 | 263 | 105 | 291 | 229 | 294 | 116 | 134 | 031 | 354 |
| 30 | 195 | 146 | 341 | 291 | 262 | 106 | 305 | 181 | 256 | 091 | 122 | 033 | 317 |
| 31 | 208 | 108 | 316 | 279 | 261 | 107 | 319 | 132 | 219 | 067 | 111 | 035 | 281 |

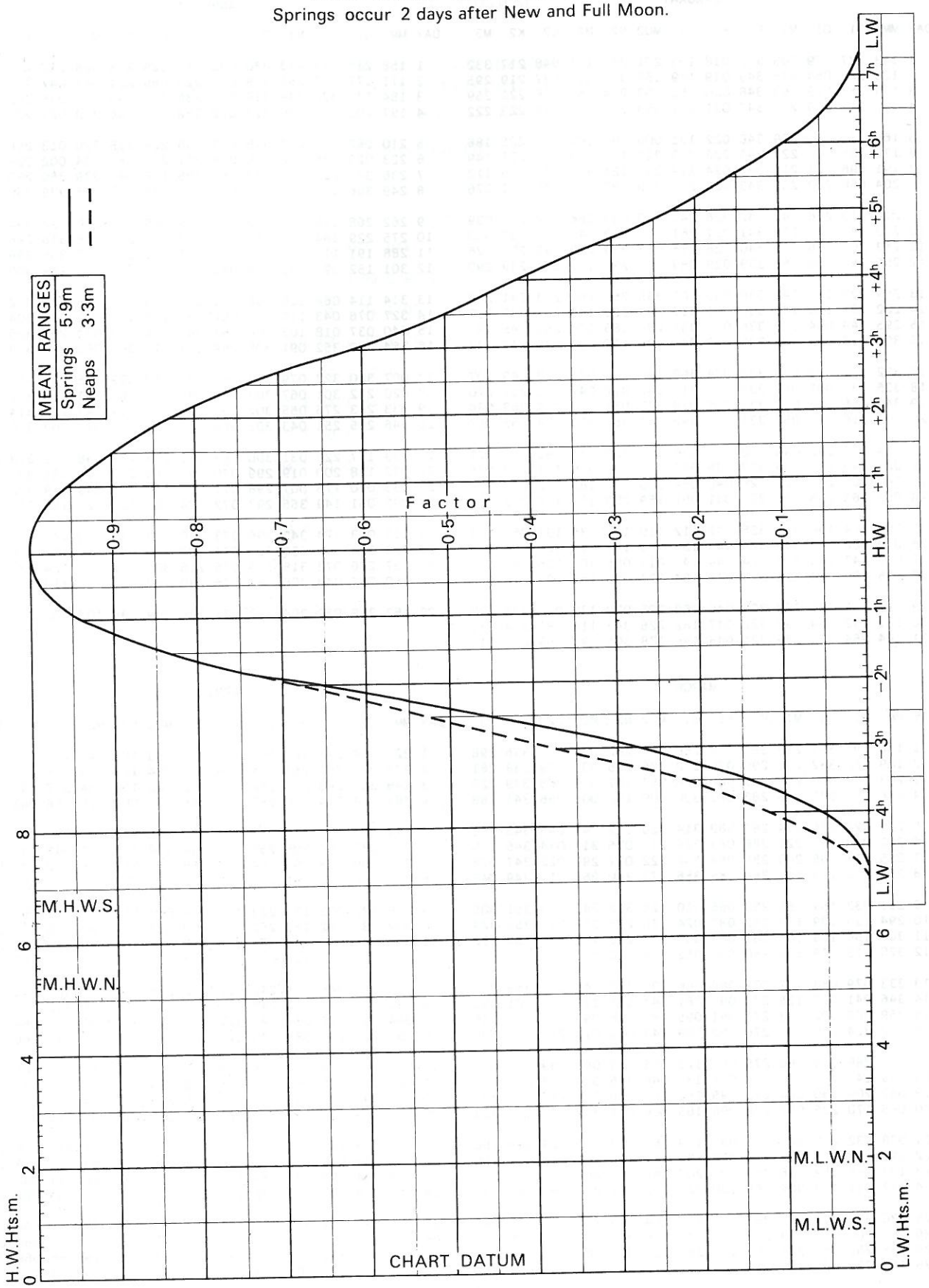
## APRIL

| DAY | MM | Q1 | O1 | M1 | P1 | K1 | J1 | MU2 | N2 | M2 | L2 | K2 | M3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 221 | 069 | 291 | 267 | 260 | 108 | 334 | 083 | 181 | 043 | 100 | 037 | 244 |
| 2 | 235 | 031 | 265 | 255 | 259 | 109 | 348 | 034 | 144 | 018 | 088 | 039 | 207 |
| 3 | 248 | 352 | 240 | 243 | 258 | 110 | 002 | 346 | 106 | 354 | 077 | 041 | 171 |
| 4 | 261 | 314 | 214 | 230 | 257 | 111 | 016 | 297 | 069 | 329 | 066 | 043 | 134 |
| 5 | 274 | 275 | 189 | 218 | 256 | 112 | 030 | 248 | 031 | 305 | 054 | 045 | 098 |
| 6 | 287 | 237 | 164 | 206 | 255 | 113 | 044 | 199 | 354 | 281 | 043 | 047 | 061 |
| 7 | 300 | 199 | 138 | 194 | 254 | 114 | 058 | 151 | 317 | 256 | 032 | 049 | 025 |
| 8 | 313 | 160 | 113 | 182 | 253 | 115 | 072 | 102 | 279 | 232 | 020 | 051 | 348 |
| 9 | 326 | 122 | 088 | 170 | 253 | 116 | 086 | 053 | 242 | 208 | 009 | 053 | 311 |
| 10 | 339 | 083 | 062 | 158 | 252 | 117 | 100 | 004 | 204 | 183 | 358 | 054 | 275 |
| 11 | 352 | 045 | 037 | 146 | 251 | 118 | 114 | 316 | 167 | 159 | 346 | 056 | 238 |
| 12 | 005 | 006 | 011 | 134 | 250 | 119 | 128 | 267 | 129 | 134 | 335 | 058 | 202 |
| 13 | 018 | 328 | 346 | 121 | 249 | 120 | 142 | 218 | 092 | 110 | 324 | 060 | 165 |
| 14 | 031 | 289 | 321 | 109 | 248 | 121 | 156 | 169 | 054 | 086 | 312 | 062 | 129 |
| 15 | 044 | 251 | 295 | 097 | 247 | 122 | 170 | 120 | 017 | 061 | 301 | 064 | 092 |
| 16 | 057 | 213 | 270 | 085 | 246 | 123 | 184 | 072 | 340 | 037 | 290 | 066 | 055 |
| 17 | 070 | 174 | 245 | 073 | 245 | 124 | 198 | 023 | 302 | 013 | 279 | 068 | 019 |
| 18 | 084 | 136 | 219 | 061 | 244 | 125 | 212 | 334 | 265 | 348 | 267 | 070 | 342 |
| 19 | 097 | 097 | 194 | 049 | 243 | 126 | 226 | 285 | 227 | 324 | 256 | 072 | 306 |
| 20 | 110 | 059 | 169 | 037 | 242 | 127 | 241 | 237 | 190 | 299 | 245 | 074 | 269 |
| 21 | 123 | 020 | 143 | 025 | 241 | 128 | 255 | 188 | 152 | 275 | 233 | 076 | 233 |
| 22 | 136 | 342 | 118 | 012 | 240 | 129 | 269 | 139 | 115 | 251 | 222 | 078 | 196 |
| 23 | 149 | 304 | 092 | 000 | 239 | 130 | 283 | 090 | 077 | 226 | 211 | 080 | 159 |
| 24 | 162 | 265 | 067 | 348 | 238 | 131 | 297 | 042 | 040 | 202 | 199 | 082 | 123 |
| 25 | 175 | 227 | 042 | 336 | 237 | 132 | 311 | 353 | 002 | 177 | 188 | 084 | 086 |
| 26 | 188 | 188 | 016 | 324 | 236 | 133 | 325 | 304 | 325 | 153 | 177 | 086 | 050 |
| 27 | 201 | 150 | 351 | 312 | 235 | 134 | 339 | 255 | 288 | 129 | 165 | 088 | 013 |
| 28 | 214 | 111 | 326 | 300 | 234 | 135 | 353 | 207 | 250 | 104 | 154 | 090 | 337 |
| 29 | 227 | 073 | 300 | 288 | 233 | 136 | 007 | 158 | 213 | 080 | 143 | 092 | 300 |
| 30 | 240 | 035 | 275 | 276 | 232 | 137 | 021 | 109 | 175 | 056 | 131 | 094 | 263 |

# DOVER

MEAN SPRING AND NEAP CURVES

Springs occur 2 days after New and Full Moon.



# ENGLAND, SOUTH COAST - DOVER

**LAT 51°07'N LONG 1°19'E**

TIME ZONE **UT(GMT)** TIMES AND HEIGHTS OF HIGH AND LOW WATERS YEAR **1992**

## JANUARY

| | Time | m | | Time | m |
|---|---|---|---|---|---|
| **1** | 0303 | 1.9 | **16** | 0154 | 2.1 |
| W | 0813 | 5.7 | TH | 0700 | 5.6 |
| | 1538 | 1.7 | | 1439 | 1.8 |
| | 2051 | 5.6 | | 1944 | 5.6 |
| **2** | 0406 | 1.8 | **17** | 0317 | 1.8 |
| TH | 0912 | 5.8 | F | 0809 | 5.8 |
| | 1633 | 1.6 | | 1555 | 1.5 |
| | 2142 | 5.8 | | 2050 | 5.9 |
| **3** | 0457 | 1.6 | **18** | 0426 | 1.4 |
| F | 1002 | 6.0 | SA | 0911 | 6.1 |
| | 1719 | 1.5 | | 1658 | 1.2 |
| | 2226 | 6.1 | | 2149 | 6.2 |
| **4** | 0540 | 1.4 | **19** | 0525 | 1.1 |
| SA | 1045 | 6.1 | SU | 1007 | 6.4 |
| ● | 1800 | 1.4 | | 1756 | 1.0 |
| | 2304 | 6.2 | O | 2242 | 6.5 |
| **5** | 0619 | 1.2 | **20** | 0619 | 0.8 |
| SU | 1123 | 6.2 | M | 1101 | 6.6 |
| | 1835 | 1.3 | | 1850 | 0.8 |
| | 2340 | 6.3 | | 2332 | 6.8 |
| **6** | 0655 | 1.1 | **21** | 0710 | 0.5 |
| M | 1157 | 6.2 | TU | 1151 | 6.7 |
| | 1907 | 1.2 | | 1940 | 0.6 |
| **7** | 0012 | 6.4 | **22** | 0018 | 6.9 |
| TU | 0728 | 1.1 | W | 0757 | 0.4 |
| | 1228 | 6.2 | | 1238 | 6.7 |
| | 1938 | 1.2 | | 2023 | 0.6 |
| **8** | 0043 | 6.4 | **23** | 0103 | 6.9 |
| W | 0801 | 1.1 | TH | 0842 | 0.4 |
| | 1257 | 6.1 | | 1324 | 6.6 |
| | 2009 | 1.2 | | 2103 | 0.7 |
| **9** | 0114 | 6.4 | **24** | 0145 | 6.8 |
| TH | 0833 | 1.2 | F | 0922 | 0.6 |
| | 1327 | 6.1 | | 1408 | 6.5 |
| | 2040 | 1.3 | | 2139 | 0.9 |
| **10** | 0145 | 6.3 | **25** | 0229 | 6.7 |
| F | 0905 | 1.3 | SA | 1003 | 0.8 |
| | 1358 | 6.0 | | 1453 | 6.2 |
| | 2112 | 1.4 | | 2216 | 1.2 |
| **11** | 0218 | 6.2 | **26** | 0315 | 6.4 |
| SA | 0939 | 1.4 | SU | 1045 | 1.2 |
| | 1433 | 5.8 | | 1542 | 5.9 |
| | 2146 | 1.6 | | 2257 | 1.6 |
| **12** | 0253 | 6.1 | **27** | 0406 | 6.0 |
| SU | 1013 | 1.6 | M | 1133 | 1.6 |
| | 1515 | 5.7 | | 1638 | 5.5 |
| | 2224 | 1.8 | | 2350 | 2.0 |
| **13** | 0338 | 5.9 | **28** | 0509 | 5.6 |
| M | 1055 | 1.8 | TU | 1234 | 2.0 |
| | 1609 | 5.5 | | 1751 | 5.2 |
| | 2315 | 2.0 | | | |
| **14** | 0435 | 5.7 | **29** | 0102 | 2.2 |
| TU | 1156 | 2.0 | W | 0628 | 5.3 |
| | 1715 | 5.4 | | 1349 | 2.1 |
| | | | | 1917 | 5.1 |
| **15** | 0025 | 2.2 | **30** | 0229 | 2.2 |
| W | 0546 | 5.6 | TH | 0752 | 5.3 |
| | 1316 | 2.0 | | 1510 | 2.0 |
| | 1829 | 5.4 | | 2033 | 5.3 |
| | | | **31** | 0345 | 1.9 |
| | | | F | 0900 | 5.5 |
| | | | | 1614 | 1.8 |
| | | | | 2128 | 5.6 |

## FEBRUARY

| | Time | m | | Time | m |
|---|---|---|---|---|---|
| **1** | 0441 | 1.6 | **16** | 0407 | 1.4 |
| SA | 0952 | 5.7 | SU | 0907 | 6.0 |
| | 1704 | 1.6 | | 1644 | 1.2 |
| | 2212 | 5.9 | | 2143 | 6.2 |
| **2** | 0526 | 1.4 | **17** | 0509 | 0.9 |
| SU | 1033 | 5.9 | M | 1002 | 6.3 |
| | 1746 | 1.4 | | 1743 | 0.9 |
| | 2247 | 6.1 | | 2233 | 6.5 |
| **3** | 0605 | 1.2 | **18** | 0607 | 0.6 |
| M | 1106 | 6.0 | TU | 1051 | 6.6 |
| ● | 1821 | 1.2 | | 1839 | 0.6 |
| | 2319 | 6.3 | O | 2318 | 6.8 |
| **4** | 0641 | 1.0 | **19** | 0657 | 0.4 |
| TU | 1137 | 6.2 | W | 1136 | 6.8 |
| | 1852 | 1.1 | | 1927 | 0.5 |
| | 2350 | 6.4 | | | |
| **5** | 0712 | 0.9 | **20** | 0000 | 7.0 |
| W | 1204 | 6.2 | TH | 0744 | 0.3 |
| | 1920 | 1.1 | | 1218 | 6.8 |
| | | | | 2005 | 0.5 |
| **6** | 0019 | 6.5 | **21** | 0041 | 7.0 |
| TH | 0742 | 0.9 | F | 0823 | 0.3 |
| | 1232 | 6.3 | | 1259 | 6.7 |
| | 1948 | 1.0 | | 2039 | 0.6 |
| **7** | 0048 | 6.5 | **22** | 0120 | 6.9 |
| F | 0812 | 0.9 | SA | 0900 | 0.5 |
| | 1259 | 6.3 | | 1340 | 6.5 |
| | 2018 | 1.0 | | 2111 | 0.8 |
| **8** | 0116 | 6.5 | **23** | 0159 | 6.7 |
| SA | 0842 | 1.0 | SU | 0935 | 0.8 |
| | 1327 | 6.2 | | 1420 | 6.3 |
| | 2049 | 1.1 | | 2143 | 1.1 |
| **9** | 0142 | 6.4 | **24** | 0242 | 6.4 |
| SU | 0912 | 1.2 | M | 1010 | 1.2 |
| | 1358 | 6.1 | | 1505 | 5.9 |
| | 2118 | 1.3 | | 2219 | 1.5 |
| **10** | 0215 | 6.3 | **25** | 0329 | 6.0 |
| M | 0942 | 1.4 | TU | 1049 | 1.6 |
| | 1434 | 6.0 | | 1557 | 5.5 |
| | 2150 | 1.6 | | 2304 | 1.9 |
| **11** | 0256 | 6.2 | **26** | 0428 | 5.5 |
| TU | 1016 | 1.6 | W | 1143 | 2.1 |
| | 1524 | 5.8 | | 1706 | 5.1 |
| | 2234 | 1.8 | | | |
| **12** | 0350 | 5.9 | **27** | 0010 | 2.3 |
| W | 1108 | 1.9 | TH | 0553 | 5.0 |
| | 1628 | 5.5 | | 1300 | 2.4 |
| | 2339 | 2.1 | | 1845 | 4.9 |
| **13** | 0504 | 5.6 | **28** | 0148 | 2.4 |
| TH | 1229 | 2.0 | F | 0731 | 5.0 |
| | 1751 | 5.3 | | 1437 | 2.3 |
| | | | | 2009 | 5.1 |
| **14** | 0113 | 2.1 | **29** | 0318 | 2.0 |
| F | 0632 | 5.4 | SA | 0843 | 5.3 |
| | 1408 | 1.9 | | 1549 | 1.9 |
| | 1927 | 5.4 | | 2105 | 5.5 |
| **15** | 0251 | 1.8 | | | |
| SA | 0758 | 5.6 | | | |
| | 1535 | 1.6 | | | |
| | 2046 | 5.7 | | | |

## MARCH

| | Time | m | | Time | m |
|---|---|---|---|---|---|
| **1** | 0419 | 1.6 | **16** | 0349 | 1.2 |
| SU | 0934 | 5.6 | M | 0901 | 6.0 |
| | 1641 | 1.6 | | 1626 | 1.2 |
| | 2148 | 5.8 | | 2129 | 6.2 |
| **2** | 0504 | 1.3 | **17** | 0451 | 0.9 |
| M | 1012 | 5.8 | TU | 0950 | 6.3 |
| | 1723 | 1.4 | | 1725 | 0.9 |
| | 2221 | 6.1 | | 2214 | 6.6 |
| **3** | 0543 | 1.1 | **18** | 0547 | 0.6 |
| TU | 1041 | 6.0 | W | 1034 | 6.5 |
| | 1800 | 1.2 | | 1818 | 0.7 |
| | 2252 | 6.3 | O | 2257 | 6.8 |
| **4** | 0618 | 0.9 | **19** | 0638 | 0.4 |
| W | 1108 | 6.2 | TH | 1116 | 6.7 |
| ● | 1831 | 1.0 | | 1902 | 0.5 |
| | 2320 | 6.4 | | 2336 | 7.0 |
| **5** | 0650 | 0.8 | **20** | 0720 | 0.3 |
| TH | 1134 | 6.3 | F | 1156 | 6.7 |
| | 1859 | 0.9 | | 1937 | 0.5 |
| | 2350 | 6.5 | | | |
| **6** | 0721 | 0.8 | **21** | 0015 | 7.0 |
| F | 1201 | 6.4 | SA | 0757 | 0.4 |
| | 1927 | 0.9 | | 1234 | 6.7 |
| | | | | 2009 | 0.6 |
| **7** | 0017 | 6.6 | **22** | 0053 | 6.8 |
| SA | 0751 | 0.8 | SU | 0832 | 0.6 |
| | 1229 | 6.4 | | 1312 | 6.5 |
| | 1957 | 0.9 | | 2043 | 0.8 |
| **8** | 0043 | 6.6 | **23** | 0131 | 6.6 |
| SU | 0819 | 0.9 | M | 0905 | 0.8 |
| | 1259 | 6.4 | | 1351 | 6.3 |
| | 2027 | 1.0 | | 2115 | 1.1 |
| **9** | 0113 | 6.5 | **24** | 0212 | 6.3 |
| M | 0849 | 1.0 | TU | 0939 | 1.2 |
| | 1330 | 6.3 | | 1433 | 5.9 |
| | 2058 | 1.1 | | 2150 | 1.4 |
| **10** | 0147 | 6.4 | **25** | 0257 | 5.8 |
| TU | 0919 | 1.2 | W | 1016 | 1.7 |
| | 1408 | 6.1 | | 1522 | 5.6 |
| | 2134 | 1.4 | | 2231 | 1.8 |
| **11** | 0227 | 6.2 | **26** | 0353 | 5.3 |
| W | 0956 | 1.5 | TH | 1101 | 2.1 |
| | 1457 | 5.9 | | 1626 | 5.1 |
| | 2216 | 1.7 | | 2326 | 2.2 |
| **12** | 0324 | 5.8 | **27** | 0518 | 4.9 |
| TH | 1048 | 1.8 | F | 1207 | 2.4 |
| | 1604 | 5.5 | | 1800 | 4.9 |
| | 2320 | 1.9 | | | |
| **13** | 0441 | 5.4 | **28** | 0050 | 2.4 |
| F | 1207 | 2.0 | SA | 0702 | 4.9 |
| | 1736 | 5.2 | | 1342 | 2.4 |
| | | | | 1930 | 5.1 |
| **14** | 0053 | 2.0 | **29** | 0234 | 2.1 |
| SA | 0624 | 5.3 | SU | 0812 | 5.2 |
| | 1351 | 1.9 | | 1507 | 2.1 |
| | 1921 | 5.4 | | 2029 | 5.4 |
| **15** | 0233 | 1.7 | **30** | 0339 | 1.7 |
| SU | 0758 | 5.6 | M | 0901 | 5.5 |
| | 1518 | 1.5 | | 1603 | 1.7 |
| | 2036 | 5.8 | | 2111 | 5.7 |
| | | | **31** | 0427 | 1.4 |
| | | | TU | 0936 | 5.7 |
| | | | | 1647 | 1.4 |
| | | | | 2145 | 6.0 |

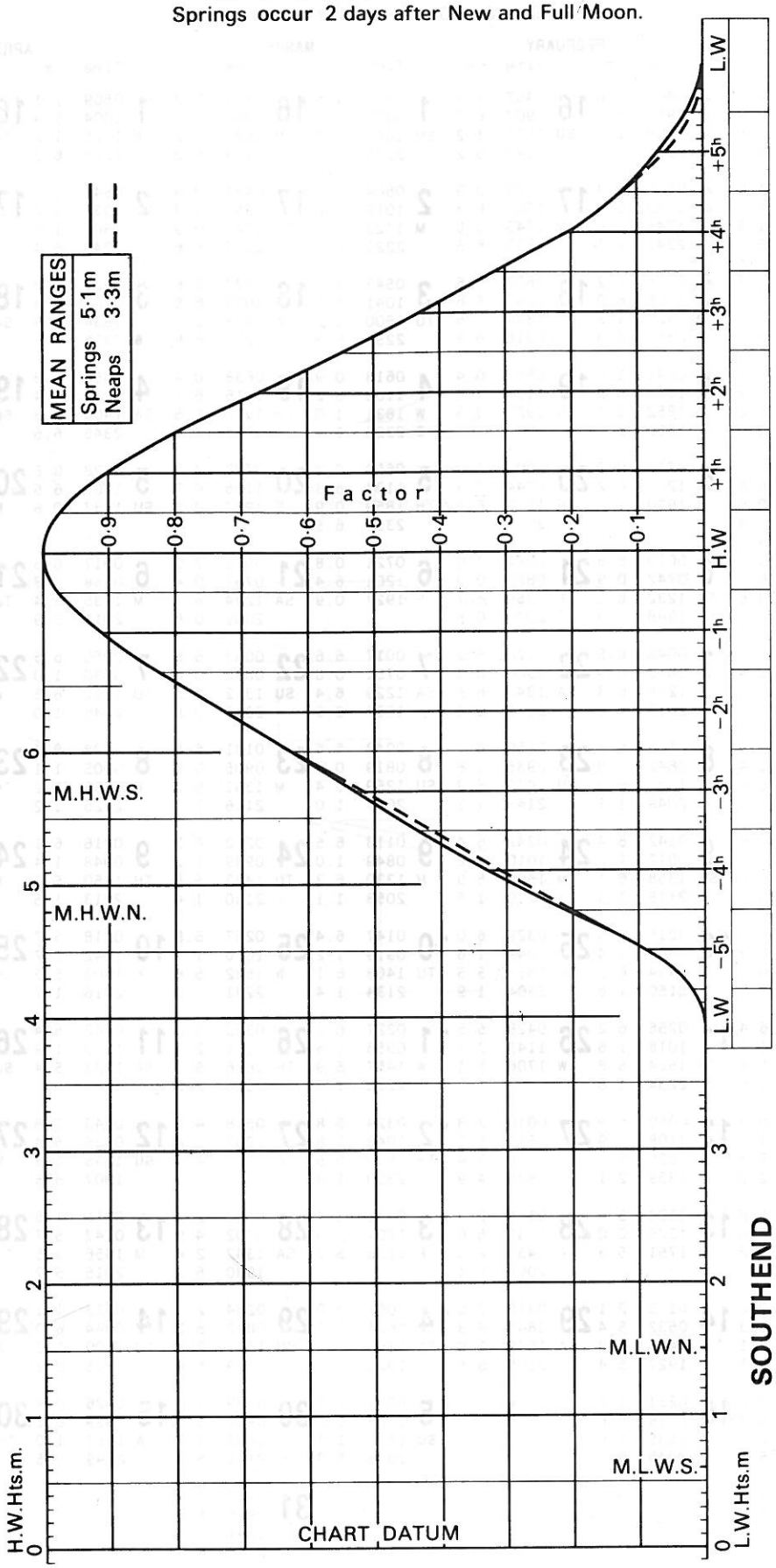
## APRIL

| | Time | m | | Time | m |
|---|---|---|---|---|---|
| **1** | 0509 | 1.1 | **16** | 0520 | 0.7 |
| W | 1004 | 5.9 | TH | 1012 | 6.4 |
| | 1725 | 1.2 | | 1747 | 0.8 |
| | 2216 | 6.2 | | 2231 | 6.7 |
| **2** | 0547 | 1.0 | **17** | 0608 | 0.6 |
| TH | 1031 | 6.2 | F | 1052 | 6.5 |
| | 1801 | 1.0 | | 1829 | 0.7 |
| | 2247 | 6.4 | O | 2312 | 6.8 |
| **3** | 0624 | 0.8 | **18** | 0650 | 0.5 |
| F | 1101 | 6.3 | SA | 1133 | 6.6 |
| | 1834 | 0.9 | | 1906 | 0.7 |
| ● | 2316 | 6.5 | | 2353 | 6.8 |
| **4** | 0656 | 0.8 | **19** | 0728 | 0.6 |
| SA | 1130 | 6.4 | SU | 1212 | 6.5 |
| | 1906 | 0.8 | | 1942 | 0.7 |
| | 2346 | 6.6 | | | |
| **5** | 0728 | 0.8 | **20** | 0031 | 6.6 |
| SU | 1203 | 6.5 | M | 0805 | 0.7 |
| | 1937 | 0.8 | | 1250 | 6.4 |
| | | | | 2018 | 0.9 |
| **6** | 0017 | 6.6 | **21** | 0109 | 6.4 |
| M | 0758 | 0.8 | TU | 0840 | 1.0 |
| | 1235 | 6.4 | | 1328 | 6.2 |
| | 2011 | 0.9 | | 2053 | 1.1 |
| **7** | 0050 | 6.5 | **22** | 0149 | 6.1 |
| TU | 0830 | 1.0 | W | 0914 | 1.3 |
| | 1312 | 6.3 | | 1411 | 6.0 |
| | 2046 | 1.0 | | 2128 | 1.4 |
| **8** | 0128 | 6.4 | **23** | 0233 | 5.7 |
| W | 0905 | 1.1 | TH | 0948 | 1.7 |
| | 1355 | 6.2 | | 1456 | 5.7 |
| | 2125 | 1.2 | | 2206 | 1.7 |
| **9** | 0216 | 6.1 | **24** | 0325 | 5.3 |
| TH | 0948 | 1.4 | F | 1027 | 2.0 |
| | 1450 | 5.9 | | 1552 | 5.3 |
| | 2213 | 1.5 | | 2254 | 2.0 |
| **10** | 0318 | 5.7 | **25** | 0437 | 5.0 |
| F | 1042 | 1.7 | SA | 1120 | 2.3 |
| | 1602 | 5.5 | | 1705 | 5.1 |
| | 2316 | 1.7 | | 2357 | 2.2 |
| **11** | 0442 | 5.4 | **26** | 0607 | 4.9 |
| SA | 1200 | 1.9 | SU | 1232 | 2.4 |
| | 1733 | 5.4 | | 1829 | 5.1 |
| **12** | 0043 | 1.8 | **27** | 0119 | 2.1 |
| SU | 0625 | 5.4 | M | 0719 | 5.1 |
| | 1335 | 1.8 | | 1354 | 2.2 |
| | 1907 | 5.5 | | 1934 | 5.3 |
| **13** | 0215 | 1.5 | **28** | 0236 | 1.9 |
| M | 0747 | 5.7 | TU | 0809 | 5.4 |
| | 1456 | 1.5 | | 1501 | 1.9 |
| | 2015 | 5.9 | | 2020 | 5.6 |
| **14** | 0325 | 1.1 | **29** | 0334 | 1.6 |
| TU | 0844 | 6.0 | W | 0847 | 5.6 |
| | 1600 | 1.2 | | 1555 | 1.6 |
| | 2105 | 6.2 | | 2100 | 5.9 |
| **15** | 0426 | 0.9 | **30** | 0423 | 1.3 |
| W | 0929 | 6.2 | TH | 0919 | 5.9 |
| | 1657 | 1.0 | | 1642 | 1.3 |
| | 2149 | 6.5 | | 2135 | 6.1 |

# SHEERNESS

MEAN SPRING AND NEAP CURVES

Springs occur 2 days after New and Full Moon.




## SOUTHEND

To obtain predictions for SOUTHEND the following corrections should be applied to the predictions for SHEERNESS:—

| | |
|---|---|
| All Times | −5 mins. |
| H.W. Heights | Nil. |
| L.W. Heights | −0·1m |

# ENGLAND, EAST COAST - SHEERNESS

**LAT 51°27'N LONG 0°45'E**

TIME ZONE **UT(GMT)** TIMES AND HEIGHTS OF HIGH AND LOW WATERS YEAR **1992**

## JANUARY

| | Time | m | | Time | m |
|---|---|---|---|---|---|
| **1** | 0315 | 1.5 | **16** | 0206 | 1.5 |
| W | 0943 | 5.0 | TH | 0832 | 5.0 |
| | 1559 | 1.2 | | 1456 | 1.3 |
| | 2219 | 5.1 | | 2119 | 5.0 |
| **2** | 0427 | 1.3 | **17** | 0328 | 1.3 |
| TH | 1045 | 5.1 | F | 0946 | 5.2 |
| | 1655 | 1.2 | | 1609 | 1.1 |
| | 2312 | 5.2 | | 2226 | 5.2 |
| **3** | 0526 | 1.1 | **18** | 0438 | 1.1 |
| F | 1137 | 5.2 | SA | 1054 | 5.4 |
| | 1740 | 1.2 | | 1712 | 1.0 |
| | 2358 | 5.3 | | 2326 | 5.5 |
| **4** | 0614 | 1.0 | **19** | 0544 | 0.8 |
| SA | 1222 | 5.3 | SU | 1153 | 5.7 |
| ● | 1819 | 1.1 | ○ | 1810 | 0.8 |
| **5** | 0038 | 5.4 | **20** | 0019 | 5.6 |
| SU | 0655 | 0.9 | M | 0646 | 0.5 |
| | 1300 | 5.4 | | 1245 | 5.9 |
| | 1853 | 1.1 | | 1900 | 0.7 |
| **6** | 0113 | 5.4 | **21** | 0107 | 5.8 |
| M | 0730 | 0.9 | TU | 0740 | 0.3 |
| | 1335 | 5.4 | | 1334 | 6.0 |
| | 1926 | 1.0 | | 1947 | 0.7 |
| **7** | 0144 | 5.5 | **22** | 0152 | 5.9 |
| TU | 0802 | 0.8 | W | 0827 | 0.2 |
| | 1408 | 5.5 | | 1419 | 6.1 |
| | 1957 | 1.0 | | 2030 | 0.6 |
| **8** | 0215 | 5.5 | **23** | 0236 | 6.0 |
| W | 0833 | 0.8 | TH | 0911 | 0.1 |
| | 1440 | 5.5 | | 1504 | 6.0 |
| | 2029 | 0.9 | | 2110 | 0.7 |
| **9** | 0246 | 5.5 | **24** | 0318 | 6.0 |
| TH | 0904 | 0.8 | F | 0952 | 0.2 |
| | 1512 | 5.5 | | 1549 | 5.9 |
| | 2103 | 1.0 | | 2148 | 0.8 |
| **10** | 0318 | 5.5 | **25** | 0402 | 5.9 |
| F | 0936 | 0.8 | SA | 1030 | 0.4 |
| | 1546 | 5.4 | | 1634 | 5.6 |
| | 2136 | 1.1 | | 2226 | 0.9 |
| **11** | 0350 | 5.4 | **26** | 0447 | 5.6 |
| SA | 1009 | 0.9 | SU | 1108 | 0.7 |
| | 1623 | 5.3 | | 1722 | 5.3 |
| | 2209 | 1.2 | | 2306 | 1.1 |
| **12** | 0427 | 5.3 | **27** | 0536 | 5.3 |
| SU | 1041 | 1.0 | M | 1149 | 1.0 |
| | 1704 | 5.1 | | 1814 | 5.0 |
| | 2247 | 1.3 | | 2357 | 1.4 |
| **13** | 0509 | 5.2 | **28** | 0636 | 5.0 |
| M | 1120 | 1.1 | TU | 1245 | 1.3 |
| | 1751 | 5.0 | | 1919 | 4.7 |
| | 2334 | 1.4 | | | |
| **14** | 0603 | 5.0 | **29** | 0107 | 1.6 |
| TU | 1214 | 1.2 | W | 0752 | 4.7 |
| | 1855 | 4.9 | | 1405 | 1.5 |
| | | | | 2036 | 4.6 |
| **15** | 0042 | 1.5 | **30** | 0244 | 1.6 |
| W | 0713 | 4.9 | TH | 0919 | 4.7 |
| | 1330 | 1.3 | | 1527 | 1.5 |
| | 2008 | 4.9 | | 2153 | 4.8 |
| | | | **31** | 0412 | 1.4 |
| | | | F | 1031 | 4.9 |
| | | | | 1633 | 1.4 |
| | | | | 2254 | 5.0 |

## FEBRUARY

| | Time | m | | Time | m |
|---|---|---|---|---|---|
| **1** | 0515 | 1.2 | **16** | 0423 | 1.0 |
| SA | 1125 | 5.1 | SU | 1041 | 5.3 |
| | 1723 | 1.3 | | 1655 | 1.1 |
| | 2342 | 5.2 | | 2311 | 5.3 |
| **2** | 0603 | 1.0 | **17** | 0537 | 0.7 |
| SU | 1207 | 5.3 | M | 1142 | 5.7 |
| | 1803 | 1.1 | | 1756 | 0.9 |
| **3** | 0021 | 5.3 | **18** | 0004 | 5.6 |
| M | 0641 | 0.9 | TU | 0636 | 0.4 |
| | 1243 | 5.4 | | 1232 | 5.9 |
| ● | 1838 | 1.0 | ○ | 1848 | 0.7 |
| **4** | 0055 | 5.5 | **19** | 0050 | 5.9 |
| TU | 0713 | 0.8 | W | 0727 | 0.2 |
| | 1316 | 5.5 | | 1319 | 6.0 |
| | 1909 | 0.9 | | 1933 | 0.6 |
| **5** | 0126 | 5.6 | **20** | 0134 | 6.0 |
| W | 0744 | 0.7 | TH | 0811 | 0.1 |
| | 1347 | 5.6 | | 1401 | 6.1 |
| | 1941 | 0.8 | | 2013 | 0.5 |
| **6** | 0155 | 5.6 | **21** | 0215 | 6.1 |
| TH | 0815 | 0.6 | F | 0851 | 0.1 |
| | 1416 | 5.6 | | 1443 | 6.0 |
| | 2013 | 0.7 | | 2051 | 0.5 |
| **7** | 0225 | 5.7 | **22** | 0256 | 6.1 |
| F | 0847 | 0.6 | SA | 0928 | 0.2 |
| | 1447 | 5.6 | | 1524 | 5.8 |
| | 2046 | 0.8 | | 2127 | 0.7 |
| **8** | 0256 | 5.7 | **23** | 0336 | 5.9 |
| SA | 0918 | 0.6 | SU | 1000 | 0.5 |
| | 1519 | 5.6 | | 1604 | 5.6 |
| | 2115 | 0.9 | | 2200 | 0.8 |
| **9** | 0327 | 5.6 | **24** | 0419 | 5.7 |
| SU | 0945 | 0.8 | M | 1033 | 0.8 |
| | 1553 | 5.5 | | 1645 | 5.3 |
| | 2143 | 1.0 | | 2235 | 1.1 |
| **10** | 0359 | 5.5 | **25** | 0504 | 5.3 |
| M | 1009 | 0.9 | TU | 1106 | 1.1 |
| | 1630 | 5.3 | | 1730 | 4.9 |
| | 2212 | 1.1 | | 2318 | 1.4 |
| **11** | 0438 | 5.4 | **26** | 0558 | 4.9 |
| TU | 1037 | 1.0 | W | 1154 | 1.5 |
| | 1713 | 5.1 | | 1828 | 4.6 |
| | 2252 | 1.2 | | | |
| **12** | 0526 | 5.1 | **27** | 0019 | 1.6 |
| W | 1123 | 1.2 | TH | 0713 | 4.5 |
| | 1810 | 4.9 | | 1312 | 1.8 |
| | 2354 | 1.4 | | 1947 | 4.4 |
| **13** | 0634 | 4.9 | **28** | 0209 | 1.7 |
| TH | 1238 | 1.4 | F | 0850 | 4.5 |
| | 1926 | 4.7 | | 1453 | 1.8 |
| | | | | 2121 | 4.5 |
| **14** | 0126 | 1.5 | **29** | 0346 | 1.5 |
| F | 0801 | 4.8 | SA | 1007 | 4.8 |
| | 1423 | 1.5 | | 1604 | 1.5 |
| | 2049 | 4.8 | | 2227 | 4.8 |
| **15** | 0303 | 1.3 | | | |
| SA | 0927 | 5.0 | | | |
| | 1546 | 1.3 | | | |
| | 2206 | 5.0 | | | |

## MARCH

| | Time | m | | Time | m |
|---|---|---|---|---|---|
| **1** | 0449 | 1.2 | **16** | 0412 | 0.9 |
| SU | 1101 | 5.1 | M | 1028 | 5.4 |
| | 1657 | 1.3 | | 1638 | 1.1 |
| | 2316 | 5.1 | | 2252 | 5.3 |
| **2** | 0536 | 1.0 | **17** | 0523 | 0.6 |
| M | 1143 | 5.3 | TU | 1126 | 5.7 |
| | 1739 | 1.1 | | 1737 | 0.9 |
| | 2354 | 5.3 | | 2344 | 5.6 |
| **3** | 0614 | 0.8 | **18** | 0619 | 0.3 |
| TU | 1218 | 5.5 | W | 1214 | 5.9 |
| | 1814 | 0.9 | ○ | 1828 | 0.7 |
| **4** | 0028 | 5.5 | **19** | 0029 | 5.9 |
| W | 0646 | 0.7 | TH | 0706 | 0.2 |
| ● | 1249 | 5.6 | | 1257 | 6.0 |
| | 1846 | 0.8 | | 1912 | 0.5 |
| **5** | 0059 | 5.6 | **20** | 0112 | 6.0 |
| TH | 0719 | 0.6 | F | 0747 | 0.1 |
| | 1320 | 5.7 | | 1338 | 6.0 |
| | 1919 | 0.7 | | 1951 | 0.4 |
| **6** | 0128 | 5.7 | **21** | 0151 | 6.1 |
| F | 0749 | 0.5 | SA | 0825 | 0.2 |
| | 1349 | 5.8 | | 1418 | 5.9 |
| | 1952 | 0.6 | | 2029 | 0.5 |
| **7** | 0159 | 5.8 | **22** | 0232 | 6.1 |
| SA | 0822 | 0.5 | SU | 0858 | 0.4 |
| | 1420 | 5.8 | | 1456 | 5.8 |
| | 2025 | 0.6 | | 2105 | 0.6 |
| **8** | 0229 | 5.8 | **23** | 0311 | 5.9 |
| SU | 0854 | 0.6 | M | 0929 | 0.7 |
| | 1453 | 5.7 | | 1534 | 5.5 |
| | 2056 | 0.8 | | 2138 | 0.8 |
| **9** | 0301 | 5.7 | **24** | 0352 | 5.6 |
| M | 0919 | 0.7 | TU | 0959 | 1.0 |
| | 1527 | 5.6 | | 1612 | 5.2 |
| | 2122 | 0.9 | | 2209 | 1.1 |
| **10** | 0336 | 5.6 | **25** | 0435 | 5.2 |
| TU | 0942 | 0.9 | W | 1031 | 1.3 |
| | 1602 | 5.4 | | 1652 | 4.9 |
| | 2150 | 1.0 | | 2245 | 1.3 |
| **11** | 0416 | 5.4 | **26** | 0526 | 4.8 |
| W | 1010 | 1.0 | TH | 1113 | 1.6 |
| | 1645 | 5.1 | | 1742 | 4.6 |
| | 2231 | 1.1 | | 2340 | 1.6 |
| **12** | 0506 | 5.2 | **27** | 0634 | 4.5 |
| TH | 1058 | 1.3 | F | 1219 | 1.9 |
| | 1740 | 4.9 | | 1852 | 4.3 |
| | 2333 | 1.3 | | | |
| **13** | 0615 | 4.9 | **28** | 0116 | 1.7 |
| F | 1214 | 1.5 | SA | 0802 | 4.4 |
| | 1856 | 4.7 | | 1404 | 1.9 |
| | | | | 2025 | 4.3 |
| **14** | 0106 | 1.4 | **29** | 0301 | 1.5 |
| SA | 0744 | 4.8 | SU | 0927 | 4.6 |
| | 1359 | 1.6 | | 1522 | 1.6 |
| | 2025 | 4.7 | | 2145 | 4.6 |
| **15** | 0249 | 1.3 | **30** | 0404 | 1.2 |
| SU | 0914 | 5.0 | M | 1024 | 5.0 |
| | 1527 | 1.4 | | 1617 | 1.3 |
| | 2148 | 5.0 | | 2237 | 5.0 |
| | | | **31** | 0454 | 1.0 |
| | | | TU | 1106 | 5.3 |
| | | | | 1702 | 1.1 |
| | | | | 2318 | 5.2 |

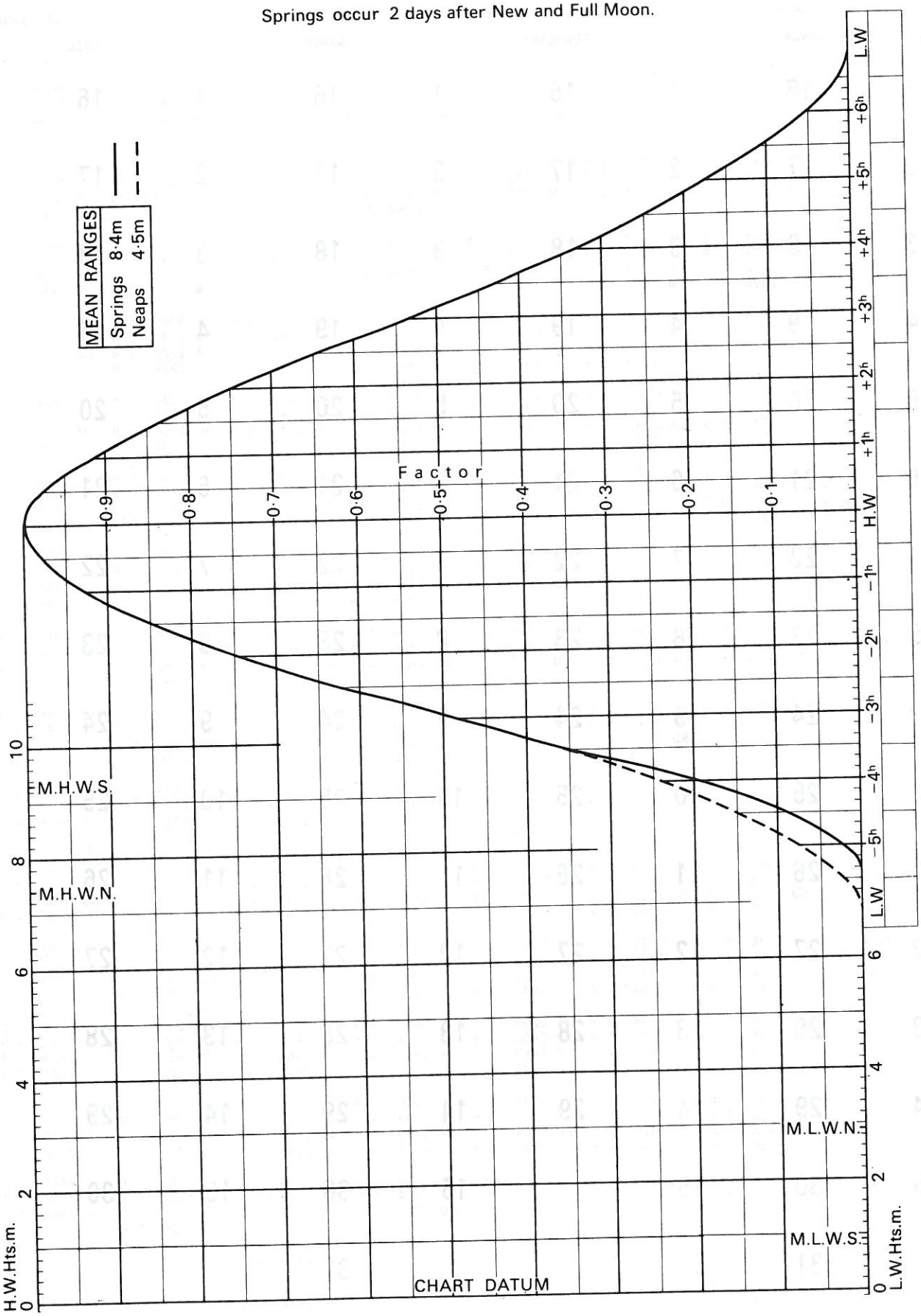
## APRIL

| | Time | m | | Time | m |
|---|---|---|---|---|---|
| **1** | 0534 | 0.8 | **16** | 0556 | 0.4 |
| W | 1143 | 5.5 | TH | 1151 | 5.8 |
| | 1740 | 0.9 | | 1804 | 0.7 |
| | 2354 | 5.5 | | | |
| **2** | 0611 | 0.6 | **17** | 0005 | 5.8 |
| TH | 1217 | 5.6 | F | 0639 | 0.3 |
| | 1817 | 0.8 | | 1235 | 5.8 |
| | | | ○ | 1848 | 0.6 |
| **3** | 0027 | 5.6 | **18** | 0049 | 5.9 |
| F | 0645 | 0.6 | SA | 0719 | 0.3 |
| | 1249 | 5.7 | | 1314 | 5.9 |
| ● | 1852 | 0.7 | | 1930 | 0.5 |
| **4** | 0059 | 5.7 | **19** | 0130 | 6.0 |
| SA | 0720 | 0.5 | SU | 0755 | 0.4 |
| | 1321 | 5.8 | | 1354 | 5.8 |
| | 1928 | 0.6 | | 2009 | 0.5 |
| **5** | 0131 | 5.8 | **20** | 0211 | 5.9 |
| SU | 0755 | 0.5 | M | 0829 | 0.6 |
| | 1354 | 5.8 | | 1430 | 5.7 |
| | 2005 | 0.6 | | 2046 | 0.7 |
| **6** | 0205 | 5.8 | **21** | 0250 | 5.7 |
| M | 0827 | 0.6 | TU | 0901 | 0.8 |
| | 1427 | 5.7 | | 1507 | 5.4 |
| | 2039 | 0.7 | | 2118 | 0.9 |
| **7** | 0242 | 5.8 | **22** | 0331 | 5.4 |
| TU | 0857 | 0.8 | W | 0931 | 1.1 |
| | 1503 | 5.6 | | 1542 | 5.2 |
| | 2110 | 0.8 | | 2149 | 1.1 |
| **8** | 0321 | 5.6 | **23** | 0412 | 5.1 |
| W | 0925 | 0.9 | TH | 1002 | 1.3 |
| | 1542 | 5.4 | | 1620 | 5.0 |
| | 2143 | 0.9 | | 2221 | 1.3 |
| **9** | 0404 | 5.5 | **24** | 0458 | 4.9 |
| TH | 1002 | 1.1 | F | 1041 | 1.6 |
| | 1627 | 5.2 | | 1705 | 4.7 |
| | 2230 | 1.0 | | 2309 | 1.4 |
| **10** | 0459 | 5.2 | **25** | 0554 | 4.6 |
| F | 1054 | 1.3 | SA | 1137 | 1.8 |
| | 1725 | 4.9 | | 1804 | 4.5 |
| | 2334 | 1.2 | | | |
| **11** | 0610 | 5.0 | **26** | 0019 | 1.5 |
| SA | 1208 | 1.5 | SU | 0703 | 4.5 |
| | 1839 | 4.7 | | 1255 | 1.8 |
| | | | | 1919 | 4.4 |
| **12** | 0103 | 1.2 | **27** | 0155 | 1.5 |
| SU | 0733 | 4.9 | M | 0822 | 4.6 |
| | 1341 | 1.6 | | 1423 | 1.7 |
| | 2004 | 4.8 | | 2037 | 4.6 |
| **13** | 0234 | 1.1 | **28** | 0305 | 1.2 |
| M | 0858 | 5.1 | TU | 0927 | 4.9 |
| | 1503 | 1.4 | | 1525 | 1.4 |
| | 2124 | 5.0 | | 2141 | 4.9 |
| **14** | 0353 | 0.8 | **29** | 0400 | 1.0 |
| TU | 1007 | 5.4 | W | 1017 | 5.2 |
| | 1613 | 1.1 | | 1616 | 1.2 |
| | 2227 | 5.3 | | 2230 | 5.1 |
| **15** | 0501 | 0.6 | **30** | 0447 | 0.8 |
| W | 1104 | 5.6 | TH | 1101 | 5.4 |
| | 1713 | 0.9 | | 1659 | 1.0 |
| | 2320 | 5.6 | | 2312 | 5.4 |

# LIVERPOOL

MEAN SPRING AND NEAP CURVES

Springs occur 2 days after New and Full Moon.



# ENGLAND, WEST COAST - LIVERPOOL

LAT 53°25'N LONG 3°00'W

TIME ZONE UT(GMT) TIMES AND HEIGHTS OF HIGH AND LOW WATERS YEAR 1992

## JANUARY

| | Time | m | | Time | m |
|---|---|---|---|---|---|
| 1 | 0246 | 2.5 | 16 | 0138 | 2.7 |
| W | 0830 | 7.9 | TH | 0727 | 7.7 |
| | 1514 | 2.6 | | 1420 | 2.7 |
| | 2058 | 8.0 | | 2001 | 8.0 |
| 2 | 0342 | 2.3 | 17 | 0251 | 2.3 |
| TH | 0924 | 8.3 | F | 0837 | 8.2 |
| | 1610 | 2.3 | | 1529 | 2.1 |
| | 2150 | 8.2 | | 2107 | 8.5 |
| 3 | 0430 | 2.1 | 18 | 0355 | 1.8 |
| F | 1010 | 8.6 | SA | 0936 | 8.8 |
| | 1657 | 2.1 | | 1631 | 1.5 |
| | 2235 | 8.4 | | 2206 | 9.0 |
| 4 | 0511 | 2.0 | 19 | 0451 | 1.3 |
| SA | 1051 | 8.8 | SU | 1030 | 9.3 |
| ● | 1736 | 1.9 | | 1727 | 0.9 |
| | 2313 | 8.6 | O | 2258 | 9.4 |
| 5 | 0546 | 1.8 | 20 | 0543 | 0.9 |
| SU | 1127 | 9.0 | M | 1120 | 9.7 |
| | 1812 | 1.7 | | 1818 | 0.4 |
| | 2349 | 8.7 | | 2347 | 9.7 |
| 6 | 0618 | 1.8 | 21 | 0631 | 0.6 |
| M | 1201 | 9.1 | TU | 1207 | 10.0 |
| | 1845 | 1.6 | | 1907 | 0.1 |
| 7 | 0021 | 8.7 | 22 | 0034 | 9.8 |
| TU | 1235 | 9.1 | W | 0716 | 0.5 |
| | 1916 | 1.6 | | 1253 | 10.1 |
| | | | | 1952 | 0.1 |
| 8 | 0052 | 8.7 | 23 | 0119 | 9.7 |
| W | 0720 | 1.7 | TH | 0759 | 0.6 |
| | 1307 | 9.0 | | 1337 | 10.0 |
| | 1947 | 1.6 | | 2034 | 0.3 |
| 9 | 0124 | 8.6 | 24 | 0202 | 9.4 |
| TH | 0752 | 1.8 | F | 0840 | 0.9 |
| | 1340 | 8.9 | | 1420 | 9.6 |
| | 2019 | 1.7 | | 2117 | 0.8 |
| 10 | 0157 | 8.4 | 25 | ~~0246~~ | 9.0 |
| F | 0827 | 2.0 | SA | 0922 | 1.4 |
| | 1412 | 8.7 | | 1504 | 9.2 |
| | 2054 | 1.9 | | 2157 | 1.4 |
| 11 | 0229 | 8.2 | 26 | 0331 | 8.5 |
| SA | 0903 | 2.3 | SU | 1006 | 1.9 |
| | 1447 | 8.5 | | 1552 | 8.5 |
| | 2131 | 2.2 | | 2244 | 2.1 |
| 12 | 0307 | 8.0 | 27 | 0421 | 8.0 |
| SU | 0943 | 2.6 | M | 1058 | 2.5 |
| | 1529 | 8.2 | | 1648 | 7.9 |
| | 2213 | 2.5 | | 2342 | 2.7 |
| 13 | 0353 | 7.8 | 28 | 0525 | 7.5 |
| M | 1031 | 2.9 | TU | 1207 | 3.0 |
| | 1620 | 7.9 | | 1800 | 7.3 |
| | 2305 | 2.7 | | | |
| 14 | 0452 | 7.6 | 29 | 0056 | 3.1 |
| TU | 1134 | 3.1 | W | 0643 | 7.3 |
| | 1726 | 7.7 | | 1333 | 3.2 |
| | | | | 1928 | 7.2 |
| 15 | 0017 | 2.9 | 30 | 0216 | 3.1 |
| W | 0608 | 7.5 | TH | 0805 | 7.5 |
| | 1259 | 3.0 | | 1454 | 2.9 |
| | 1845 | 7.7 | | 2043 | 7.4 |
| | | | 31 | 0324 | 2.8 |
| | | | F | 0907 | 7.9 |
| | | | | 1557 | 2.5 |
| | | | | 2139 | 7.8 |

## FEBRUARY

| | Time | m | | Time | m |
|---|---|---|---|---|---|
| 1 | 0414 | 2.4 | 16 | 0341 | 1.9 |
| SA | 0956 | 8.3 | SU | 0925 | 8.7 |
| | 1644 | 2.1 | | 1620 | 1.3 |
| | 2221 | 8.2 | | 2156 | 8.9 |
| 2 | 0457 | 2.1 | 17 | 0440 | 1.3 |
| SU | 1035 | 8.7 | M | 1019 | 9.3 |
| | 1723 | 1.8 | | 1716 | 0.6 |
| | 2258 | 8.5 | | 2247 | 9.5 |
| 3 | 0530 | 1.8 | 18 | 0530 | 0.7 |
| M | 1111 | 9.0 | TU | 1106 | 9.8 |
| | 1756 | 1.6 | | 1805 | 0.1 |
| ● | 2330 | 8.7 | O | 2332 | 9.8 |
| 4 | 0603 | 1.6 | 19 | 0617 | 0.4 |
| TU | 1143 | 9.1 | W | 1151 | 10.1 |
| | 1827 | 1.4 | | 1849 | -0.1 |
| 5 | 0001 | 8.8 | 20 | 0015 | 9.9 |
| W | 0632 | 1.4 | TH | 0659 | 0.2 |
| | 1215 | 9.2 | | 1234 | 10.2 |
| | 1856 | 1.3 | | 1931 | -0.1 |
| 6 | 0031 | 8.9 | 21 | 0056 | 9.8 |
| TH | 0702 | 1.3 | F | 0738 | 0.3 |
| | 1245 | 9.2 | | 1314 | 10.0 |
| | 1926 | 1.2 | | 2009 | 0.2 |
| 7 | 0100 | 8.9 | 22 | 0135 | 9.6 |
| F | 0734 | 1.4 | SA | 0816 | 0.6 |
| | 1316 | 9.2 | | 1355 | 9.7 |
| | 1957 | 1.3 | | 2046 | 0.8 |
| 8 | 0130 | 8.8 | 23 | 0215 | 9.1 |
| SA | 0805 | 1.5 | SU | 0854 | 1.2 |
| | 1345 | 9.0 | | 1434 | 9.1 |
| | 2027 | 1.5 | | 2122 | 1.5 |
| 9 | 0159 | 8.6 | 24 | 0254 | 8.6 |
| SU | 0837 | 1.8 | M | 0934 | 1.8 |
| | 1418 | 8.8 | | 1517 | 8.4 |
| | 2100 | 1.8 | | 2202 | 2.2 |
| 10 | 0233 | 8.4 | 25 | 0339 | 8.0 |
| M | 0912 | 2.1 | TU | 1019 | 2.5 |
| | 1454 | 8.5 | | 1606 | 7.6 |
| | 2135 | 2.2 | | 2251 | 3.0 |
| 11 | 0315 | 8.1 | 26 | 0435 | 7.4 |
| TU | 0953 | 2.5 | W | 1120 | 3.1 |
| | 1542 | 8.1 | | 1716 | 7.0 |
| | 2221 | 2.6 | | | |
| 12 | 0409 | 7.8 | 27 | 0005 | 3.5 |
| W | 1052 | 2.9 | TH | 0557 | 7.0 |
| | 1645 | 7.7 | | 1255 | 3.4 |
| | 2329 | 2.9 | | 1856 | 6.8 |
| 13 | 0526 | 7.4 | 28 | 0144 | 3.5 |
| TH | 1219 | 3.0 | F | 0733 | 7.1 |
| | 1814 | 7.5 | | 1427 | 3.2 |
| | | | | 2022 | 7.1 |
| 14 | 0103 | 3.0 | 29 | 0258 | 3.1 |
| F | 0659 | 7.5 | SA | 0843 | 7.6 |
| | 1357 | 2.7 | | 1532 | 2.7 |
| | 1944 | 7.7 | | 2118 | 7.6 |
| 15 | 0232 | 2.6 | | | |
| SA | 0820 | 8.0 | | | |
| | 1515 | 2.1 | | | |
| | 2057 | 8.3 | | | |

## MARCH

| | Time | m | | Time | m |
|---|---|---|---|---|---|
| 1 | 0352 | 2.6 | 16 | 0325 | 1.9 |
| SU | 0932 | 8.1 | M | 0908 | 8.7 |
| | 1620 | 2.2 | | 1604 | 1.2 |
| | 2159 | 8.1 | | 2141 | 8.9 |
| 2 | 0433 | 2.1 | 17 | 0423 | 1.2 |
| M | 1012 | 8.6 | TU | 1000 | 9.3 |
| | 1658 | 1.8 | | 1658 | 0.5 |
| | 2234 | 8.5 | | 2228 | 9.4 |
| 3 | 0508 | 1.7 | 18 | 0512 | 0.7 |
| TU | 1045 | 8.9 | W | 1047 | 9.8 |
| | 1730 | 1.4 | | 1744 | 0.2 |
| | 2305 | 8.8 | O | 2312 | 9.7 |
| 4 | 0539 | 1.4 | 19 | 0556 | 0.4 |
| W | 1118 | 9.2 | TH | 1130 | 10.0 |
| ● | 1800 | 1.2 | | 1827 | 0.0 |
| | 2334 | 9.0 | | 2353 | 9.8 |
| 5 | 0608 | 1.2 | 20 | 0636 | 0.3 |
| TH | 1149 | 9.3 | F | 1211 | 10.0 |
| | 1831 | 1.0 | | 1904 | 0.1 |
| 6 | 0004 | 9.1 | 21 | 0031 | 9.7 |
| F | 0641 | 1.1 | SA | 0714 | 0.4 |
| | 1218 | 9.4 | | 1250 | 9.8 |
| | 1902 | 1.0 | | 1941 | 0.5 |
| 7 | 0034 | 9.1 | 22 | 0109 | 9.5 |
| SA | 0712 | 1.1 | SU | 0751 | 0.7 |
| | 1249 | 9.3 | | 1328 | 9.4 |
| | 1931 | 1.1 | | 2015 | 1.0 |
| 8 | 0103 | 9.1 | 23 | 0145 | 9.1 |
| SU | 0744 | 1.2 | M | 0827 | 1.2 |
| | 1320 | 9.2 | | 1405 | 8.9 |
| | 2002 | 1.3 | | 2049 | 1.7 |
| 9 | 0134 | 8.9 | 24 | 0222 | 8.6 |
| M | 0816 | 1.5 | TU | 0904 | 1.9 |
| | 1354 | 9.0 | | 1446 | 8.2 |
| | 2033 | 1.6 | | 2124 | 2.4 |
| 10 | 0209 | 8.7 | 25 | 0304 | 8.1 |
| TU | 0851 | 1.8 | W | 0945 | 2.5 |
| | 1432 | 8.7 | | 1532 | 7.5 |
| | 2108 | 2.0 | | 2206 | 3.1 |
| 11 | 0250 | 8.3 | 26 | 0357 | 7.5 |
| W | 0934 | 2.3 | TH | 1041 | 3.1 |
| | 1521 | 8.2 | | 1637 | 6.9 |
| | 2156 | 2.5 | | 2312 | 3.6 |
| 12 | 0345 | 7.9 | 27 | 0512 | 7.0 |
| TH | 1033 | 2.7 | F | 1207 | 3.4 |
| | 1627 | 7.7 | | 1811 | 6.7 |
| | 2304 | 2.9 | | | |
| 13 | 0505 | 7.5 | 28 | 0056 | 3.7 |
| F | 1201 | 2.9 | SA | 0645 | 7.0 |
| | 1758 | 7.4 | | 1341 | 3.2 |
| | | | | 1942 | 6.9 |
| 14 | 0042 | 3.0 | 29 | 0218 | 3.3 |
| SA | 0641 | 7.5 | SU | 0801 | 7.4 |
| | 1341 | 2.5 | | 1449 | 2.8 |
| | 1931 | 7.7 | | 2042 | 7.5 |
| 15 | 0213 | 2.6 | 30 | 0314 | 2.8 |
| SU | 0804 | 8.0 | M | 0854 | 7.9 |
| | 1501 | 1.9 | | 1539 | 2.3 |
| | 2043 | 8.3 | | 2124 | 8.0 |
| | | | 31 | 0356 | 2.3 |
| | | | TU | 0935 | 8.4 |
| | | | | 1619 | 1.8 |
| | | | | 2200 | 8.4 |

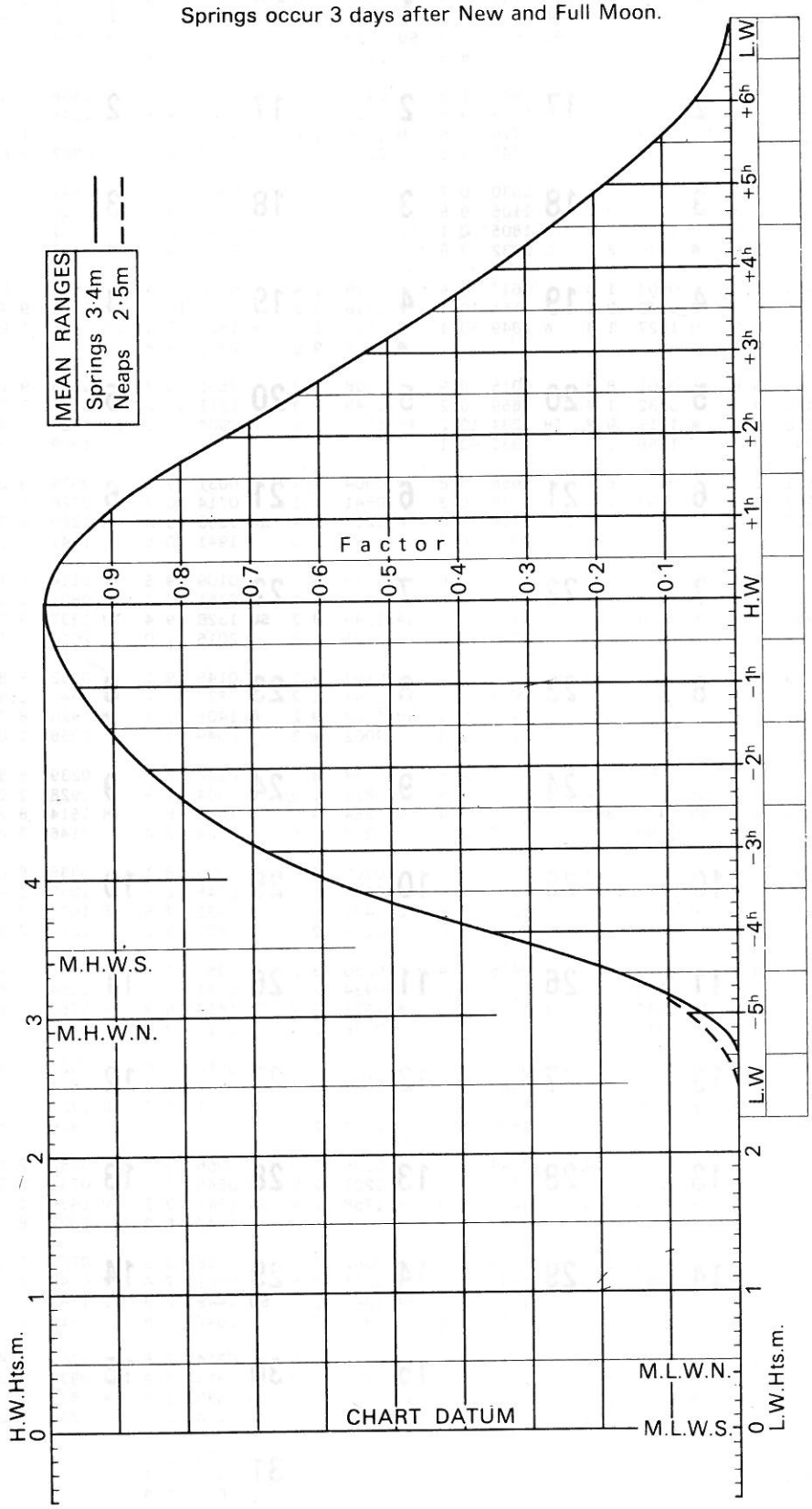
## APRIL

| | Time | m | | Time | m |
|---|---|---|---|---|---|
| 1 | 0433 | 1.8 | 16 | 0448 | 0.9 |
| W | 1012 | 8.8 | TH | 1024 | 9.5 |
| | 1654 | 1.5 | | 1719 | 0.5 |
| | 2231 | 8.7 | | 2248 | 9.5 |
| 2 | 0508 | 1.5 | 17 | 0532 | 0.7 |
| TH | 1045 | 9.0 | F | 1106 | 9.6 |
| | 1727 | 1.2 | | 1800 | 0.5 |
| | 2302 | 9.0 | O | 2327 | 9.6 |
| 3 | 0542 | 1.2 | 18 | 0612 | 0.6 |
| F | 1118 | 9.2 | SA | 1147 | 9.6 |
| | 1801 | 1.0 | | 1836 | 0.6 |
| ● | 2333 | 9.1 | | | |
| 4 | 0615 | 1.0 | 19 | 0005 | 9.5 |
| SA | 1150 | 9.4 | SU | 0650 | 0.7 |
| | 1835 | 1.0 | | 1227 | 9.4 |
| | | | | 1913 | 0.9 |
| 5 | 0005 | 9.2 | 20 | 0043 | 9.3 |
| SU | 0650 | 1.0 | M | 0728 | 1.0 |
| | 1224 | 9.4 | | 1304 | 9.0 |
| | 1909 | 1.0 | | 1947 | 1.4 |
| 6 | 0039 | 9.2 | 21 | 0120 | 9.0 |
| M | 0726 | 1.1 | TU | 0805 | 1.4 |
| | 1259 | 9.3 | | 1341 | 8.6 |
| | 1941 | 1.2 | | 2019 | 1.9 |
| 7 | 0114 | 9.1 | 22 | 0157 | 8.6 |
| TU | 0801 | 1.3 | W | 0840 | 1.9 |
| | 1337 | 9.0 | | 1420 | 8.1 |
| | 2016 | 1.6 | | 2053 | 2.4 |
| 8 | 0152 | 8.8 | 23 | 0237 | 8.2 |
| W | 0840 | 1.6 | TH | 0919 | 2.4 |
| | 1420 | 8.7 | | 1505 | 7.6 |
| | 2056 | 2.0 | | 2131 | 3.0 |
| 9 | 0239 | 8.5 | 24 | 0327 | 7.7 |
| TH | 0928 | 2.0 | F | 1007 | 2.8 |
| | 1514 | 8.2 | | 1602 | 7.1 |
| | 2146 | 2.4 | | 2226 | 3.4 |
| 10 | 0338 | 8.0 | 25 | 0430 | 7.3 |
| F | 1030 | 2.4 | SA | 1115 | 3.1 |
| | 1623 | 7.7 | | 1716 | 6.8 |
| | 2255 | 2.8 | | 2349 | 3.6 |
| 11 | 0457 | 7.7 | 26 | 0546 | 7.1 |
| SA | 1154 | 2.5 | SU | 1236 | 3.1 |
| | 1750 | 7.6 | | 1839 | 6.9 |
| 12 | 0027 | 2.8 | 27 | 0114 | 3.4 |
| SU | 0624 | 7.8 | M | 0700 | 7.3 |
| | 1324 | 2.2 | | 1347 | 2.8 |
| | 1914 | 7.8 | | 1947 | 7.3 |
| 13 | 0152 | 2.5 | 28 | 0218 | 3.0 |
| M | 0741 | 8.2 | TU | 0801 | 7.7 |
| | 1439 | 1.7 | | 1443 | 2.4 |
| | 2022 | 8.3 | | 2036 | 7.7 |
| 14 | 0301 | 1.9 | 29 | 0308 | 2.5 |
| TU | 0844 | 8.7 | W | 0850 | 8.1 |
| | 1541 | 1.2 | | 1531 | 2.0 |
| | 2118 | 8.9 | | 2117 | 8.2 |
| 15 | 0359 | 1.4 | 30 | 0352 | 2.1 |
| W | 0938 | 9.2 | TH | 0931 | 8.5 |
| | 1633 | 0.7 | | 1613 | 1.7 |
| | 2204 | 9.2 | | 2153 | 8.6 |

# CUXHAVEN

MEAN SPRING AND NEAP CURVES

Springs occur 3 days after New and Full Moon.



# GERMANY - CUXHAVEN

LAT 53°52'N LONG 8°43'E

TIME ZONE -0100 TIMES AND HEIGHTS OF HIGH AND LOW WATERS YEAR 1992

## JANUARY

| | Time | m | | Time | m |
|---|---|---|---|---|---|
| 1 | 0412 | 0.5 | 16 | 0249 | 0.5 |
| W | 1000 | 3.2 | TH | 0842 | 3.0 |
| | 1649 | 0.4 | | 1528 | 0.4 |
| | 2235 | 3.1 | | 2123 | 3.0 |
| 2 | 0521 | 0.4 | 17 | 0416 | 0.4 |
| TH | 1106 | 3.2 | F | 1001 | 3.1 |
| | 1751 | 0.4 | | 1651 | 0.3 |
| | 2332 | 3.2 | | 2240 | 3.2 |
| 3 | 0622 | 0.4 | 18 | 0536 | 0.3 |
| F | 1203 | 3.2 | SA | 1114 | 3.2 |
| | 1844 | 0.4 | | 1805 | 0.2 |
| | | | | 2345 | 3.3 |
| 4 | 0021 | 3.3 | 19 | 0646 | 0.1 |
| SA | 0714 | 0.3 | SU | 1219 | 3.2 |
| | 1250 | 3.2 | | 1909 | 0.1 |
| ● | 1929 | 0.4 | O | | |
| 5 | 0103 | 3.4 | 20 | 0042 | 3.5 |
| SU | 0758 | 0.2 | M | 0747 | 0.0 |
| | 1329 | 3.2 | | 1316 | 3.3 |
| | 2009 | 0.3 | | 2004 | 0.1 |
| 6 | 0140 | 3.4 | 21 | 0134 | 3.5 |
| M | 0836 | 0.2 | TU | 0842 | -0.1 |
| | 1406 | 3.2 | | 1410 | 3.3 |
| | 2044 | 0.2 | | 2057 | 0.0 |
| 7 | 0214 | 3.4 | 22 | 0225 | 3.6 |
| TU | 0911 | 0.1 | W | 0935 | -0.1 |
| | 1441 | 3.2 | | 1502 | 3.3 |
| | 2117 | 0.2 | | 2146 | -0.1 |
| 8 | 0248 | 3.5 | 23 | 0314 | 3.6 |
| W | 0943 | 0.1 | TH | 1023 | -0.1 |
| | 1513 | 3.1 | | 1549 | 3.3 |
| | 2147 | 0.2 | | 2230 | -0.1 |
| 9 | 0318 | 3.5 | 24 | 0357 | 3.6 |
| TH | 1013 | 0.2 | F | 1104 | -0.1 |
| | 1542 | 3.1 | | 1630 | 3.2 |
| | 2215 | 0.2 | | 2308 | 0.0 |
| 10 | 0348 | 3.4 | 25 | 0439 | 3.6 |
| F | 1042 | 0.2 | SA | 1140 | 0.0 |
| | 1612 | 3.1 | | 1711 | 3.2 |
| | 2243 | 0.2 | | 2344 | 0.1 |
| 11 | 0421 | 3.4 | 26 | 0522 | 3.5 |
| SA | 1114 | 0.2 | SU | 1215 | 0.2 |
| | 1645 | 3.0 | | 1752 | 3.1 |
| | 2314 | 0.2 | | | |
| 12 | 0457 | 3.3 | 27 | 0021 | 0.2 |
| SU | 1145 | 0.2 | M | 0606 | 3.4 |
| | 1719 | 3.0 | | 1252 | 0.3 |
| | 2347 | 0.3 | | 1834 | 3.0 |
| 13 | 0534 | 3.2 | 28 | 0104 | 0.3 |
| M | 1217 | 0.3 | TU | 0656 | 3.2 |
| | 1759 | 3.0 | | 1337 | 0.4 |
| | | | | 1927 | 2.9 |
| 14 | 0028 | 0.4 | 29 | 0202 | 0.4 |
| TU | 0620 | 3.1 | W | 0800 | 3.0 |
| | 1301 | 0.4 | | 1440 | 0.5 |
| | 1853 | 2.9 | | 2036 | 2.9 |
| 15 | 0129 | 0.5 | 30 | 0320 | 0.4 |
| W | 0724 | 3.0 | TH | 0918 | 2.9 |
| | 1407 | 0.4 | | 1559 | 0.4 |
| | 2004 | 2.9 | | 2155 | 3.0 |
| | | | 31 | 0446 | 0.3 |
| | | | F | 1038 | 2.9 |
| | | | | 1718 | 0.4 |
| | | | | 2307 | 3.1 |

## FEBRUARY

| | Time | m | | Time | m |
|---|---|---|---|---|---|
| 1 | 0600 | 0.2 | 16 | 0519 | 0.1 |
| SA | 1145 | 3.0 | SU | 1102 | 3.0 |
| | 1822 | 0.3 | | 1750 | 0.1 |
| | | | | 2332 | 3.2 |
| 2 | 0003 | 3.2 | 17 | 0636 | 0.0 |
| SU | 0657 | 0.1 | M | 1211 | 3.1 |
| | 1235 | 3.0 | | 1859 | 0.0 |
| | 1911 | 0.2 | | | |
| 3 | 0046 | 3.2 | 18 | 0032 | 3.4 |
| M | 0741 | 0.0 | TU | 0737 | -0.2 |
| | 1314 | 3.0 | | 1308 | 3.2 |
| ● | 1952 | 0.1 | O | 1955 | -0.1 |
| 4 | 0124 | 3.3 | 19 | 0123 | 3.5 |
| TU | 0820 | 0.0 | W | 0830 | -0.2 |
| | 1350 | 3.1 | | 1357 | 3.2 |
| | 2029 | 0.0 | | 2044 | -0.2 |
| 5 | 0158 | 3.4 | 20 | 0211 | 3.5 |
| W | 0854 | 0.0 | TH | 0918 | -0.3 |
| | 1424 | 3.1 | | 1443 | 3.2 |
| | 2101 | 0.0 | | 2129 | -0.2 |
| 6 | 0230 | 3.4 | 21 | 0256 | 3.5 |
| TH | 0924 | 0.0 | F | 1001 | -0.3 |
| | 1453 | 3.1 | | 1526 | 3.2 |
| | 2129 | 0.0 | | 2211 | -0.2 |
| 7 | 0258 | 3.4 | 22 | 0338 | 3.5 |
| F | 0951 | 0.0 | SA | 1040 | -0.2 |
| | 1519 | 3.1 | | 1605 | 3.2 |
| | 2156 | 0.0 | | 2247 | -0.2 |
| 8 | 0327 | 3.4 | 23 | 0417 | 3.5 |
| SA | 1019 | 0.0 | SU | 1113 | -0.1 |
| | 1547 | 3.1 | | 1641 | 3.2 |
| | 2225 | 0.0 | | 2319 | -0.1 |
| 9 | 0359 | 3.3 | 24 | 0455 | 3.4 |
| SU | 1050 | 0.1 | M | 1142 | 0.1 |
| | 1619 | 3.0 | | 1715 | 3.1 |
| | 2256 | 0.0 | | 2350 | 0.0 |
| 10 | 0434 | 3.3 | 25 | 0533 | 3.2 |
| M | 1120 | 0.1 | TU | 1210 | 0.2 |
| | 1650 | 3.0 | | 1751 | 3.0 |
| | 2325 | 0.1 | | | |
| 11 | 0506 | 3.2 | 26 | 0024 | 0.1 |
| TU | 1144 | 0.2 | W | 0615 | 3.0 |
| | 1722 | 3.0 | | 1245 | 0.3 |
| | 2354 | 0.2 | | 1837 | 2.9 |
| 12 | 0543 | 3.1 | 27 | 0114 | 0.2 |
| W | 1217 | 0.3 | TH | 0714 | 2.8 |
| | 1807 | 2.9 | | 1342 | 0.4 |
| | | | | 1945 | 2.8 |
| 13 | 0044 | 0.3 | 28 | 0231 | 0.3 |
| TH | 0640 | 2.9 | F | 0836 | 2.6 |
| | 1318 | 0.4 | | 1507 | 0.4 |
| | 1917 | 2.9 | | 2113 | 2.8 |
| 14 | 0205 | 0.3 | 29 | 0406 | 0.2 |
| F | 0804 | 2.8 | SA | 1005 | 2.6 |
| | 1447 | 0.3 | | 1640 | 0.3 |
| | 2047 | 2.9 | | 2238 | 2.9 |
| 15 | 0345 | 0.2 | | | |
| SA | 0938 | 2.9 | | | |
| | 1625 | 0.2 | | | |
| | 2217 | 3.1 | | | |

## MARCH

| | Time | m | | Time | m |
|---|---|---|---|---|---|
| 1 | 0532 | 0.1 | 16 | 0507 | -0.1 |
| SU | 1121 | 2.8 | M | 1052 | 2.9 |
| | 1756 | 0.2 | | 1737 | 0.0 |
| | 2340 | 3.0 | | 2320 | 3.2 |
| 2 | 0634 | 0.0 | 17 | 0622 | -0.2 |
| M | 1214 | 2.9 | TU | 1159 | 3.0 |
| | 1849 | 0.1 | | 1844 | -0.1 |
| 3 | 0024 | 3.1 | 18 | 0017 | 3.3 |
| TU | 0718 | -0.1 | W | 0720 | -0.3 |
| | 1252 | 3.0 | | 1252 | 3.1 |
| | 1929 | 0.0 | O | 1938 | -0.2 |
| 4 | 0100 | 3.2 | 19 | 0106 | 3.4 |
| W | 0754 | -0.1 | TH | 0809 | -0.3 |
| | 1326 | 3.0 | | 1337 | 3.2 |
| ● | 2005 | -0.1 | | 2025 | -0.3 |
| 5 | 0134 | 3.2 | 20 | 0152 | 3.4 |
| TH | 0828 | -0.2 | F | 0853 | -0.3 |
| | 1358 | 3.0 | | 1419 | 3.2 |
| | 2038 | -0.2 | | 2106 | -0.3 |
| 6 | 0206 | 3.3 | 21 | 0235 | 3.4 |
| F | 0857 | -0.2 | SA | 0933 | -0.2 |
| | 1427 | 3.1 | | 1458 | 3.2 |
| | 2106 | -0.2 | | 2145 | -0.3 |
| 7 | 0235 | 3.3 | 22 | 0316 | 3.4 |
| SA | 0924 | -0.1 | SU | 1009 | -0.2 |
| | 1453 | 3.1 | | 1536 | 3.3 |
| | 2134 | -0.2 | | 2221 | -0.2 |
| 8 | 0305 | 3.3 | 23 | 0354 | 3.4 |
| SU | 0954 | -0.1 | M | 1041 | -0.1 |
| | 1522 | 3.1 | | 1610 | 3.2 |
| | 2206 | -0.1 | | 2254 | -0.1 |
| 9 | 0339 | 3.3 | 24 | 0430 | 3.3 |
| M | 1027 | 0.0 | TU | 1110 | 0.0 |
| | 1555 | 3.1 | | 1642 | 3.2 |
| | 2239 | -0.1 | | 2324 | -0.1 |
| 10 | 0414 | 3.2 | 25 | 0505 | 3.1 |
| TU | 1058 | 0.0 | W | 1135 | 0.1 |
| | 1628 | 3.1 | | 1716 | 3.0 |
| | 2310 | -0.1 | | 2355 | 0.0 |
| 11 | 0449 | 3.1 | 26 | 0543 | 2.8 |
| W | 1124 | 0.1 | TH | 1205 | 0.2 |
| | 1700 | 3.0 | | 1759 | 2.9 |
| | 2339 | 0.0 | | | |
| 12 | 0526 | 3.0 | 27 | 0039 | 0.1 |
| TH | 1156 | 0.2 | F | 0636 | 2.6 |
| | 1744 | 2.9 | | 1256 | 0.3 |
| | | | | 1902 | 2.8 |
| 13 | 0026 | 0.1 | 28 | 0148 | 0.2 |
| F | 0623 | 2.8 | SA | 0753 | 2.5 |
| | 1255 | 0.3 | | 1416 | 0.3 |
| | 1854 | 2.9 | | 2028 | 2.7 |
| 14 | 0146 | 0.1 | 29 | 0320 | 0.2 |
| SA | 0748 | 2.7 | SU | 0923 | 2.5 |
| | 1427 | 0.3 | | 1552 | 0.2 |
| | 2028 | 2.9 | | 2156 | 2.8 |
| 15 | 0329 | 0.1 | 30 | 0450 | 0.1 |
| SU | 0926 | 2.8 | M | 1043 | 2.7 |
| | 1610 | 0.2 | | 1715 | 0.1 |
| | 2203 | 3.0 | | 2304 | 3.0 |
| | | | 31 | 0557 | 0.0 |
| | | | TU | 1138 | 2.8 |
| | | | | 1812 | 0.0 |
| | | | | 2349 | 3.1 |

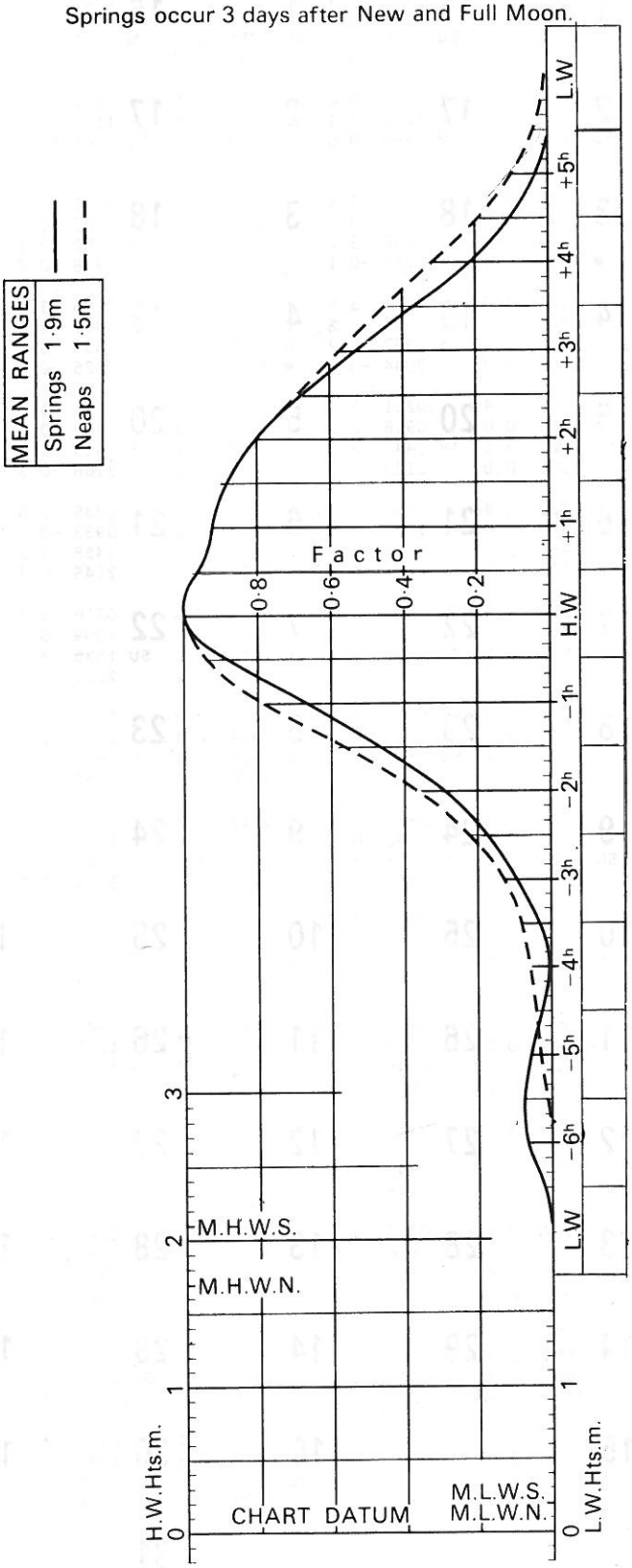
## APRIL

| | Time | m | | Time | m |
|---|---|---|---|---|---|
| 1 | 0641 | -0.1 | 16 | 0651 | -0.3 |
| W | 1217 | 2.9 | TH | 1227 | 3.1 |
| | 1853 | -0.1 | | 1912 | -0.2 |
| 2 | 0026 | 3.1 | 17 | 0043 | 3.3 |
| TH | 0717 | -0.2 | F | 0739 | -0.3 |
| | 1251 | 3.0 | | 1312 | 3.2 |
| | 1931 | -0.2 | O | 2000 | -0.2 |
| 3 | 0102 | 3.2 | 18 | 0130 | 3.4 |
| F | 0752 | -0.2 | SA | 0825 | -0.2 |
| | 1325 | 3.0 | | 1354 | 3.3 |
| ● | 2007 | -0.2 | | 2042 | -0.2 |
| 4 | 0136 | 3.2 | 19 | 0214 | 3.4 |
| SA | 0824 | -0.2 | SU | 0903 | -0.1 |
| | 1357 | 3.1 | | 1431 | 3.3 |
| | 2039 | -0.2 | | 2120 | -0.2 |
| 5 | 0209 | 3.2 | 20 | 0253 | 3.4 |
| SU | 0856 | -0.2 | M | 0937 | 0.0 |
| | 1427 | 3.1 | | 1507 | 3.3 |
| | 2112 | -0.2 | | 2156 | -0.1 |
| 6 | 0244 | 3.2 | 21 | 0330 | 3.3 |
| M | 0929 | -0.1 | TU | 1010 | 0.0 |
| | 1459 | 3.2 | | 1542 | 3.3 |
| | 2148 | -0.2 | | 2231 | -0.1 |
| 7 | 0320 | 3.2 | 22 | 0406 | 3.1 |
| TU | 1005 | -0.1 | W | 1040 | 0.0 |
| | 1536 | 3.2 | | 1615 | 3.2 |
| | 2225 | -0.2 | | 2303 | -0.1 |
| 8 | 0400 | 3.1 | 23 | 0442 | 3.0 |
| W | 1040 | -0.1 | TH | 1108 | 0.1 |
| | 1613 | 3.1 | | 1650 | 3.1 |
| | 2302 | -0.2 | | 2336 | 0.0 |
| 9 | 0441 | 3.0 | 24 | 0520 | 2.8 |
| TH | 1113 | 0.0 | F | 1138 | 0.2 |
| | 1651 | 3.1 | | 1732 | 3.0 |
| | 2339 | -0.1 | | | |
| 10 | 0526 | 2.9 | 25 | 0015 | 0.1 |
| F | 1153 | 0.1 | SA | 0607 | 2.6 |
| | 1740 | 3.0 | | 1222 | 0.2 |
| | | | | 1826 | 2.9 |
| 11 | 0030 | 0.0 | 26 | 0112 | 0.2 |
| SA | 0625 | 2.8 | SU | 0712 | 2.6 |
| | 1254 | 0.2 | | 1329 | 0.3 |
| | 1851 | 3.0 | | 1939 | 2.9 |
| 12 | 0147 | 0.1 | 27 | 0229 | 0.2 |
| SU | 0746 | 2.8 | M | 0830 | 2.6 |
| | 1422 | 0.2 | | 1454 | 0.3 |
| | 2021 | 3.1 | | 2100 | 2.9 |
| 13 | 0323 | 0.0 | 28 | 0352 | 0.1 |
| M | 0918 | 2.8 | TU | 0946 | 2.7 |
| | 1558 | 0.1 | | 1616 | 0.2 |
| | 2149 | 3.2 | | 2210 | 3.0 |
| 14 | 0452 | -0.1 | 29 | 0501 | 0.0 |
| TU | 1038 | 3.0 | W | 1045 | 2.8 |
| | 1719 | 0.0 | | 1719 | 0.1 |
| | 2300 | 3.3 | | 2301 | 3.1 |
| 15 | 0600 | -0.2 | 30 | 0550 | -0.1 |
| W | 1138 | 3.1 | TH | 1130 | 3.0 |
| | 1821 | -0.1 | | 1807 | 0.0 |
| | 2355 | 3.3 | | 2343 | 3.1 |

# HOEK VAN HOLLAND

MEAN SPRING AND NEAP CURVES

Springs occur 3 days after New and Full Moon.



# NETHERLANDS - HOEK VAN HOLLAND

LAT 51°59'N LONG 4°07'E

TIME ZONE -0100

TIMES AND HEIGHTS OF HIGH AND LOW WATERS

YEAR 1992

## JANUARY

| | Time | m | | Time | m |
|---|---|---|---|---|---|
| 1 W | 0740 | 0.4 | 16 TH | 0450 | 0.4 |
| | 1158 | 1.8 | | 1109 | 1.8 |
| | 1946 | 0.3 | | 1654 | 0.2 |
| | | | | 2345 | 1.8 |
| 2 TH | 0039 | 1.9 | 17 F | 0534 | 0.4 |
| | 0905 | 0.3 | | 1215 | 1.9 |
| | 1253 | 1.9 | | 1753 | 0.3 |
| | 2117 | 0.4 | | | |
| 3 F | 0134 | 1.9 | 18 SA | 0045 | 1.9 |
| | 0934 | 0.3 | | 0625 | 0.3 |
| | 1348 | 1.9 | | 1304 | 2.0 |
| | 1935 | 0.4 | | 1843 | 0.3 |
| 4 SA ● | 0213 | 1.9 | 19 SU ○ | 0134 | 1.9 |
| | 1020 | 0.3 | | 0705 | 0.2 |
| | 1434 | 2.0 | | 1354 | 2.1 |
| | 2015 | 0.5 | | 1929 | 0.3 |
| 5 SU | 0314 | 1.9 | 20 M | 0224 | 2.0 |
| | 0824 | 0.2 | | 0745 | 0.2 |
| | 1503 | 2.0 | | 1436 | 2.2 |
| | 2055 | 0.5 | | 2245 | 0.4 |
| 6 M | 0339 | 1.9 | 21 TU | 0307 | 2.0 |
| | 0854 | 0.2 | | 0825 | 0.1 |
| | 1538 | 2.1 | | 1525 | 2.3 |
| | 2156 | 0.5 | | 2346 | 0.4 |
| 7 TU | 0353 | 2.0 | 22 W | 0355 | 2.0 |
| | 0914 | 0.1 | | 0901 | 0.0 |
| | 1615 | 2.1 | | 1607 | 2.3 |
| | 2330 | 0.5 | | | |
| 8 W | 0434 | 2.0 | 23 TH | 0030 | 0.4 |
| | 0944 | 0.1 | | 0437 | 2.1 |
| | 1644 | 2.1 | | 0949 | 0.0 |
| | | | | 1654 | 2.3 |
| 9 TH | 0010 | 0.4 | 24 F | 0126 | 0.4 |
| | 0502 | 2.0 | | 0525 | 2.0 |
| | 1025 | 0.1 | | 1355 | 0.0 |
| | 1725 | 2.1 | | 1741 | 2.2 |
| 10 F | 0045 | 0.4 | 25 SA | 0204 | 0.4 |
| | 0533 | 1.9 | | 0614 | 2.0 |
| | 1105 | 0.1 | | 1444 | 0.0 |
| | 1754 | 2.0 | | 1837 | 2.1 |
| 11 SA | 0135 | 0.4 | 26 SU | 0305 | 0.4 |
| | 0608 | 1.9 | | 0704 | 2.0 |
| | 1145 | 0.1 | | 1244 | 0.1 |
| | 1828 | 2.0 | | 1935 | 2.0 |
| 12 SU | 0157 | 0.4 | 27 M | 0145 | 0.4 |
| | 0643 | 1.9 | | 0758 | 1.9 |
| | 1225 | 0.1 | | 1354 | 0.1 |
| | 1914 | 2.0 | | 2035 | 1.8 |
| 13 M | 0204 | 0.4 | 28 TU | 0235 | 0.4 |
| | 0738 | 1.8 | | 0905 | 1.8 |
| | 1325 | 0.1 | | 1504 | 0.2 |
| | 2019 | 1.9 | | 2144 | 1.7 |
| 14 TU | 0235 | 0.4 | 29 W | 0355 | 0.4 |
| | 0844 | 1.8 | | 1024 | 1.7 |
| | 1434 | 0.1 | | 1624 | 0.3 |
| | 2135 | 1.8 | | 2319 | 1.6 |
| 15 W | 0325 | 0.4 | 30 TH | 0505 | 0.3 |
| | 0959 | 1.7 | | 1133 | 1.7 |
| | 1535 | 0.2 | | 1745 | 0.3 |
| | 2245 | 1.8 | | | |
| | | | 31 F | 0024 | 1.7 |
| | | | | 0604 | 0.3 |
| | | | | 1249 | 1.8 |
| | | | | 1850 | 0.4 |

## FEBRUARY

| | Time | m | | Time | m |
|---|---|---|---|---|---|
| 1 SA | 0125 | 1.8 | 16 SU | 0035 | 1.7 |
| | 0930 | 0.2 | | 0554 | 0.2 |
| | 1338 | 1.9 | | 1255 | 2.0 |
| | 2145 | 0.4 | | 2107 | 0.3 |
| 2 SU | 0208 | 1.9 | 17 M | 0124 | 1.8 |
| | 1004 | 0.2 | | 0646 | 0.2 |
| | 1418 | 2.0 | | 1337 | 2.1 |
| | 2230 | 0.4 | | 2145 | 0.3 |
| 3 M ● | 0256 | 1.9 | 18 TU ○ | 0203 | 1.9 |
| | 0810 | 0.2 | | 0725 | 0.1 |
| | 1443 | 2.0 | | 1425 | 2.2 |
| | 2047 | 0.4 | | 2235 | 0.3 |
| 4 TU | 0313 | 1.9 | 19 W | 0250 | 2.0 |
| | 0834 | 0.1 | | 0759 | 0.0 |
| | 1513 | 2.1 | | 1506 | 2.3 |
| | 2147 | 0.4 | | 2315 | 0.3 |
| 5 W | 0355 | 2.0 | 20 TH | 0335 | 2.0 |
| | 0855 | 0.1 | | 0838 | 0.0 |
| | 1554 | 2.1 | | 1548 | 2.3 |
| | 2310 | 0.4 | | | |
| 6 TH | 0410 | 2.0 | 21 F | 0016 | 0.3 |
| | 1144 | 0.1 | | 0414 | 2.1 |
| | 1624 | 2.1 | | 1250 | 0.0 |
| | 2345 | 0.4 | | 1635 | 2.2 |
| 7 F | 0437 | 2.0 | 22 SA | 0106 | 0.3 |
| | 1235 | 0.0 | | 0456 | 2.1 |
| | 1654 | 2.1 | | 1346 | 0.0 |
| | | | | 1718 | 2.1 |
| 8 SA | 0046 | 0.3 | 23 SU | 0156 | 0.3 |
| | 0508 | 2.0 | | 0545 | 2.1 |
| | 1316 | 0.0 | | 1425 | 0.0 |
| | 1724 | 2.1 | | 1804 | 2.0 |
| 9 SU | 0115 | 0.3 | 24 M | 0224 | 0.3 |
| | 0538 | 2.0 | | 0624 | 2.0 |
| | 1059 | 0.0 | | 1250 | 0.1 |
| | 1754 | 2.0 | | 1854 | 1.9 |
| 10 M | 0135 | 0.4 | 25 TU | 0107 | 0.3 |
| | 0614 | 2.0 | | 0713 | 1.9 |
| | 1145 | 0.0 | | 1335 | 0.1 |
| | 1839 | 2.0 | | 1943 | 1.7 |
| 11 TU | 0004 | 0.3 | 26 W | 0210 | 0.2 |
| | 0654 | 1.9 | | 0819 | 1.8 |
| | 1234 | 0.0 | | 1445 | 0.2 |
| | 1924 | 1.9 | | 2054 | 1.5 |
| 12 W | 0150 | 0.3 | 27 TH | 0325 | 0.3 |
| | 0755 | 1.9 | | 0939 | 1.6 |
| | 1415 | 0.1 | | 1604 | 0.3 |
| | 2045 | 1.8 | | 2254 | 1.4 |
| 13 TH | 0245 | 0.3 | 28 F | 0445 | 0.2 |
| | 0914 | 1.7 | | 1119 | 1.6 |
| | 1530 | 0.2 | | 1715 | 0.3 |
| | 2153 | 1.7 | | | |
| 14 F | 0404 | 0.3 | 29 SA | 0005 | 1.5 |
| | 1033 | 1.7 | | 0540 | 0.2 |
| | 1644 | 0.2 | | 1224 | 1.7 |
| | 2325 | 1.6 | | 1815 | 0.3 |
| 15 SA | 0520 | 0.3 | | | |
| | 1155 | 1.8 | | | |
| | 1744 | 0.3 | | | |

## MARCH

| | Time | m | | Time | m |
|---|---|---|---|---|---|
| 1 SU | 0053 | 1.7 | 16 M | 0019 | 1.6 |
| | 0624 | 0.2 | | 0826 | 0.1 |
| | 1314 | 1.8 | | 1238 | 2.0 |
| | 2117 | 0.3 | | 2045 | 0.2 |
| 2 M | 0144 | 1.8 | 17 TU | 0103 | 1.7 |
| | 0956 | 0.1 | | 0926 | 0.1 |
| | 1355 | 1.9 | | 1325 | 2.1 |
| | 2155 | 0.3 | | 2125 | 0.2 |
| 3 TU | 0218 | 1.9 | 18 W ○ | 0155 | 1.9 |
| | 1014 | 0.1 | | 0655 | 0.0 |
| | 1425 | 2.0 | | 1405 | 2.1 |
| | 2225 | 0.3 | | 2210 | 0.3 |
| 4 W ● | 0243 | 1.9 | 19 TH | 0230 | 2.0 |
| | 0804 | 0.1 | | 0738 | 0.0 |
| | 1454 | 2.1 | | 1445 | 2.2 |
| | 2217 | 0.3 | | 2256 | 0.3 |
| 5 TH | 0314 | 2.0 | 20 F | 0310 | 2.0 |
| | 1047 | 0.1 | | 0819 | 0.0 |
| | 1520 | 2.1 | | 1524 | 2.2 |
| | 2250 | 0.3 | | 2339 | 0.2 |
| 6 F | 0344 | 2.0 | 21 SA | 0350 | 2.1 |
| | 1124 | 0.1 | | 1226 | 0.0 |
| | 1549 | 2.1 | | 1608 | 2.1 |
| | 2324 | 0.3 | | | |
| 7 SA | 0407 | 2.0 | 22 SU | 0036 | 0.2 |
| | 1216 | 0.0 | | 0434 | 2.1 |
| | 1625 | 2.1 | | 1316 | 0.0 |
| | 2355 | 0.3 | | 1651 | 2.0 |
| 8 SU | 0440 | 2.0 | 23 M | 0126 | 0.2 |
| | 0951 | 0.1 | | 0514 | 2.1 |
| | 1657 | 2.1 | | 1355 | 0.1 |
| | 2215 | 0.3 | | 1734 | 1.9 |
| 9 M | 0510 | 2.0 | 24 TU | 0205 | 0.2 |
| | 1029 | 0.0 | | 0554 | 2.0 |
| | 1730 | 2.0 | | 1430 | 0.2 |
| | 2244 | 0.2 | | 1818 | 1.8 |
| 10 TU | 0547 | 2.1 | 25 W | 0027 | 0.2 |
| | 1115 | 0.0 | | 0644 | 1.9 |
| | 1815 | 2.0 | | 1340 | 0.2 |
| | 2335 | 0.2 | | 1903 | 1.6 |
| 11 W | 0628 | 2.0 | 26 TH | 0140 | 0.1 |
| | 1204 | 0.1 | | 0739 | 1.7 |
| | 1858 | 1.8 | | 1440 | 0.2 |
| | | | | 2003 | 1.5 |
| 12 TH | 0050 | 0.2 | 27 F | 0305 | 0.1 |
| | 0718 | 1.9 | | 0854 | 1.6 |
| | 1415 | 0.1 | | 1545 | 0.3 |
| | 2004 | 1.7 | | 2129 | 1.3 |
| 13 F | 0236 | 0.2 | 28 SA | 0420 | 0.1 |
| | 0834 | 1.8 | | 1044 | 1.5 |
| | 1514 | 0.2 | | 1654 | 0.3 |
| | 2145 | 1.5 | | 2323 | 1.4 |
| 14 SA | 0335 | 0.2 | 29 SU | 0515 | 0.1 |
| | 1013 | 1.7 | | 1143 | 1.7 |
| | 1640 | 0.2 | | 1744 | 0.3 |
| | 2315 | 1.5 | | | |
| 15 SU | 0444 | 0.2 | 30 M | 0024 | 1.6 |
| | 1133 | 1.8 | | 0604 | 0.1 |
| | 1950 | 0.2 | | 1233 | 1.8 |
| | | | | 2020 | 0.3 |
| | | | 31 TU | 0103 | 1.7 |
| | | | | 0644 | 0.1 |
| | | | | 1319 | 1.9 |
| | | | | 2124 | 0.2 |

## APRIL

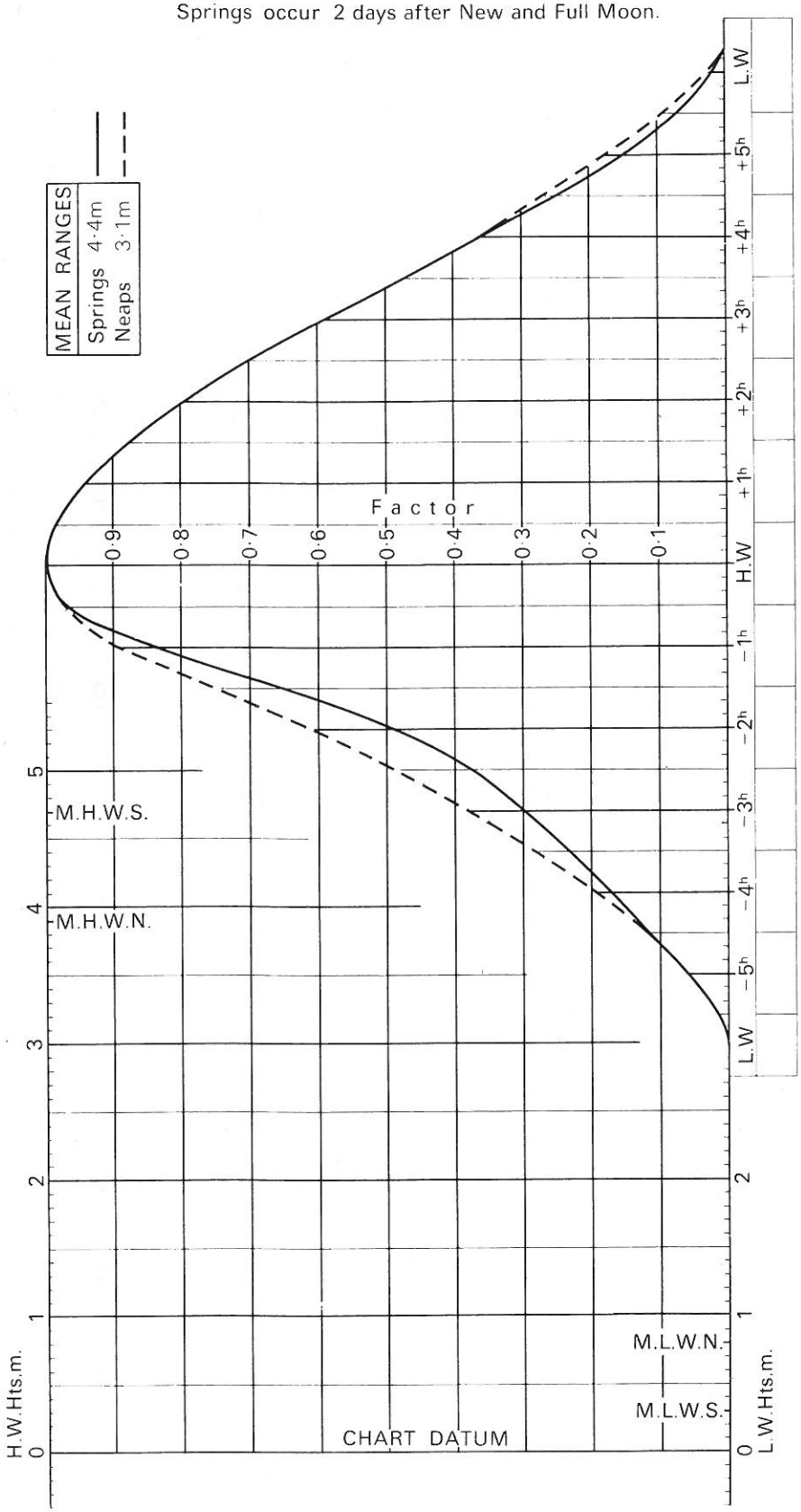
| | Time | m | | Time | m |
|---|---|---|---|---|---|
| 1 W | 0144 | 1.8 | 16 TH | 0128 | 1.8 |
| | 0930 | 0.1 | | 0940 | 0.0 |
| | 1348 | 2.0 | | 1344 | 2.1 |
| | 2210 | 0.2 | | 2145 | 0.2 |
| 2 TH | 0208 | 1.9 | 17 F ○ | 0207 | 1.9 |
| | 1010 | 0.1 | | 0715 | 0.1 |
| | 1418 | 2.0 | | 1425 | 2.0 |
| | 2240 | 0.3 | | 2236 | 0.2 |
| 3 F ● | 0234 | 1.9 | 18 SA | 0246 | 2.0 |
| | 1040 | 0.1 | | 1100 | 0.1 |
| | 1447 | 2.1 | | 1504 | 2.0 |
| | 2240 | 0.3 | | 2326 | 0.2 |
| 4 SA | 0305 | 2.0 | 19 SU | 0327 | 2.1 |
| | 0819 | 0.1 | | 1155 | 0.1 |
| | 1520 | 2.1 | | 1546 | 2.0 |
| | 2314 | 0.2 | | | |
| 5 SU | 0337 | 2.0 | 20 M | 0017 | 0.1 |
| | 1144 | 0.1 | | 0408 | 2.1 |
| | 1557 | 2.1 | | 1246 | 0.1 |
| | 2114 | 0.2 | | 1627 | 1.9 |
| 6 M | 0411 | 2.1 | 21 TU | 0101 | 0.1 |
| | 0925 | 0.1 | | 0450 | 2.1 |
| | 1630 | 2.0 | | 1325 | 0.1 |
| | 2145 | 0.2 | | 1710 | 1.8 |
| 7 TU | 0446 | 2.1 | 22 W | 0145 | 0.1 |
| | 1009 | 0.1 | | 0535 | 2.0 |
| | 1711 | 2.0 | | 1405 | 0.2 |
| | 2229 | 0.1 | | 1755 | 1.7 |
| 8 W | 0527 | 2.1 | 23 TH | 0000 | 0.1 |
| | 1055 | 0.1 | | 0614 | 1.9 |
| | 1754 | 1.9 | | 1330 | 0.3 |
| | 2314 | 0.1 | | 1832 | 1.6 |
| 9 TH | 0610 | 2.1 | 24 F | 0108 | 0.0 |
| | 1330 | 0.1 | | 0703 | 1.8 |
| | 1845 | 1.7 | | 1420 | 0.3 |
| | | | | 1929 | 1.5 |
| 10 F | 0035 | 0.1 | 25 SA | 0240 | 0.0 |
| | 0704 | 1.9 | | 0820 | 1.6 |
| | 1410 | 0.1 | | 1535 | 0.3 |
| | 2005 | 1.6 | | 2034 | 1.4 |
| 11 SA | 0155 | 0.1 | 26 SU | 0355 | 0.0 |
| | 0822 | 1.8 | | 0923 | 1.6 |
| | 1505 | 0.2 | | 1624 | 0.3 |
| | 2134 | 1.5 | | 2159 | 1.3 |
| 12 SU | 0304 | 0.1 | 27 M | 0445 | 0.0 |
| | 1015 | 1.8 | | 1053 | 1.6 |
| | 1800 | 0.2 | | 1714 | 0.3 |
| | 2243 | 1.5 | | 2334 | 1.5 |
| 13 M | 0415 | 0.1 | 28 TU | 0534 | 0.0 |
| | 1125 | 1.9 | | 1154 | 1.8 |
| | 1930 | 0.2 | | 1930 | 0.2 |
| | 2354 | 1.6 | | | |
| 14 TU | 0744 | 0.1 | 29 W | 0019 | 1.6 |
| | 1214 | 2.0 | | 0647 | 0.1 |
| | 2027 | 0.2 | | 1234 | 1.9 |
| | | | | 2055 | 0.2 |
| 15 W | 0044 | 1.7 | 30 TH | 0052 | 1.7 |
| | 0844 | 0.0 | | 0845 | 0.1 |
| | 1300 | 2.0 | | 1315 | 1.9 |
| | 2110 | 0.2 | | 2135 | 0.2 |

LOW WATERS - IMPORTANT NOTE. DOUBLE LOW WATERS OFTEN OCCUR. PREDICTIONS ARE FOR THE LOWER LOW WATER WHICH IS USUALLY THE SECOND. SEE ALSO NOTE ON PAGE 346.

# VLISSINGEN (FLUSHING)

MEAN SPRING AND NEAP CURVES

Springs occur 2 days after New and Full Moon.



# NETHERLANDS - VLISSINGEN (FLUSHING)

LAT 51°27'N LONG 3°36'E

TIME ZONE -0100 TIMES AND HEIGHTS OF HIGH AND LOW WATERS YEAR 1992

## JANUARY

| | Time | m | | Time | m |
|---|---|---|---|---|---|
| 1 | 0535 | 0.9 | 16 | 0404 | 1.0 |
| W | 1129 | 4.0 | TH | 1036 | 4.0 |
| | 1806 | 0.8 | | 1650 | 0.7 |
| | | | | 2309 | 4.1 |
| 2 | 0005 | 4.1 | 17 | 0526 | 0.8 |
| TH | 0625 | 0.8 | F | 1137 | 4.2 |
| | 1225 | 4.1 | | 1755 | 0.6 |
| | 1845 | 0.8 | | | |
| 3 | 0055 | 4.2 | 18 | 0008 | 4.3 |
| F | 0715 | 0.7 | SA | 0636 | 0.6 |
| | 1320 | 4.3 | | 1235 | 4.4 |
| | 1925 | 0.8 | | 1858 | 0.5 |
| 4 | 0146 | 4.3 | 19 | 0102 | 4.5 |
| SA | 0755 | 0.6 | SU | 0726 | 0.4 |
| | 1354 | 4.3 | | 1322 | 4.7 |
| ● | 2006 | 0.8 | ○ | 1948 | 0.4 |
| 5 | 0220 | 4.3 | 20 | 0149 | 4.7 |
| SU | 0829 | 0.5 | M | 0820 | 0.1 |
| | 1436 | 4.4 | | 1409 | 4.9 |
| | 2036 | 0.7 | | 2036 | 0.3 |
| 6 | 0252 | 4.4 | 21 | 0235 | 4.8 |
| M | 0905 | 0.4 | TU | 0908 | 0.0 |
| | 1505 | 4.5 | | 1453 | 5.0 |
| | 2110 | 0.7 | | 2122 | 0.3 |
| 7 | 0326 | 4.5 | 22 | 0318 | 4.9 |
| TU | 0946 | 0.3 | W | 0956 | -0.1 |
| | 1539 | 4.6 | | 1540 | 5.1 |
| | 2145 | 0.7 | | 2208 | 0.3 |
| 8 | 0356 | 4.5 | 23 | 0405 | 4.9 |
| W | 1019 | 0.3 | TH | 1046 | -0.1 |
| | 1610 | 4.6 | | 1626 | 5.0 |
| | 2225 | 0.7 | | 2251 | 0.4 |
| 9 | 0428 | 4.5 | 24 | 0450 | 4.8 |
| TH | 1056 | 0.3 | F | 1128 | 0.0 |
| | 1645 | 4.5 | | 1716 | 4.8 |
| | 2255 | 0.7 | | 2336 | 0.5 |
| 10 | 0502 | 4.4 | 25 | 0537 | 4.7 |
| F | 1130 | 0.4 | SA | 1216 | 0.1 |
| | 1719 | 4.4 | | 1807 | 4.6 |
| | 2325 | 0.8 | | | |
| 11 | 0535 | 4.3 | 26 | 0019 | 0.6 |
| SA | 1154 | 0.4 | SU | 0629 | 4.5 |
| | 1756 | 4.3 | | 1255 | 0.3 |
| | | | | 1901 | 4.3 |
| 12 | 0006 | 0.8 | 27 | 0110 | 0.7 |
| SU | 0616 | 4.2 | M | 0725 | 4.2 |
| | 1235 | 0.5 | | 1350 | 0.5 |
| | 1835 | 4.2 | | 1959 | 4.0 |
| 13 | 0045 | 0.8 | 28 | 0210 | 0.9 |
| M | 0655 | 4.1 | TU | 0825 | 3.9 |
| | 1326 | 0.6 | | 1456 | 0.8 |
| | 1935 | 4.0 | | 2116 | 3.7 |
| 14 | 0140 | 0.9 | 29 | 0336 | 1.0 |
| TU | 0806 | 3.9 | W | 0950 | 3.7 |
| | 1426 | 0.7 | | 1615 | 0.9 |
| | 2051 | 4.0 | | 2235 | 3.7 |
| 15 | 0244 | 1.0 | 30 | 0500 | 1.0 |
| W | 0921 | 3.9 | TH | 1110 | 3.8 |
| | 1541 | 0.8 | | 1724 | 0.9 |
| | 2200 | 3.9 | | 2346 | 3.8 |
| | | | 31 | 0610 | 0.8 |
| | | | F | 1215 | 4.0 |
| | | | | 1830 | 0.9 |

## FEBRUARY

| | Time | m | | Time | m |
|---|---|---|---|---|---|
| 1 | 0046 | 4.0 | 16 | 0620 | 0.5 |
| SA | 0659 | 0.7 | SU | 1218 | 4.4 |
| | 1310 | 4.2 | | 1846 | 0.5 |
| | 1909 | 0.8 | | | |
| 2 | 0125 | 4.2 | 17 | 0047 | 4.4 |
| SU | 0745 | 0.5 | M | 0716 | 0.3 |
| | 1350 | 4.3 | | 1312 | 4.7 |
| | 1945 | 0.7 | | 1935 | 0.4 |
| 3 | 0205 | 4.3 | 18 | 0136 | 4.6 |
| M | 0816 | 0.4 | TU | 0808 | 0.0 |
| | 1415 | 4.4 | | 1356 | 4.9 |
| ● | 2020 | 0.7 | ○ | 2022 | 0.3 |
| 4 | 0231 | 4.4 | 19 | 0216 | 4.8 |
| TU | 0849 | 0.3 | W | 0856 | -0.1 |
| | 1447 | 4.6 | | 1436 | 5.0 |
| | 2056 | 0.6 | | 2106 | 0.2 |
| 5 | 0301 | 4.6 | 20 | 0258 | 4.9 |
| W | 0926 | 0.2 | TH | 0938 | -0.2 |
| | 1517 | 4.6 | | 1518 | 5.0 |
| | 2128 | 0.5 | | 2148 | 0.2 |
| 6 | 0331 | 4.6 | 21 | 0343 | 5.0 |
| TH | 1000 | 0.2 | F | 1019 | -0.2 |
| | 1549 | 4.7 | | 1605 | 5.0 |
| | 2159 | 0.5 | | 2229 | 0.3 |
| 7 | 0402 | 4.6 | 22 | 0425 | 4.9 |
| F | 1032 | 0.2 | SA | 1106 | 0.0 |
| | 1618 | 4.6 | | 1649 | 4.8 |
| | 2236 | 0.5 | | 2309 | 0.4 |
| 8 | 0432 | 4.6 | 23 | 0506 | 4.8 |
| SA | 1106 | 0.2 | SU | 1142 | 0.1 |
| | 1649 | 4.6 | | 1735 | 4.5 |
| | 2306 | 0.6 | | 2352 | 0.5 |
| 9 | 0506 | 4.5 | 24 | 0555 | 4.5 |
| SU | 1136 | 0.3 | M | 1222 | 0.4 |
| | 1721 | 4.5 | | 1825 | 4.2 |
| | 2335 | 0.6 | | | |
| 10 | 0537 | 4.5 | 25 | 0036 | 0.6 |
| M | 1211 | 0.4 | TU | 0646 | 4.2 |
| | 1758 | 4.4 | | 1305 | 0.6 |
| | | | | 1915 | 3.9 |
| 11 | 0016 | 0.6 | 26 | 0124 | 0.8 |
| TU | 0617 | 4.3 | W | 0745 | 3.9 |
| | 1250 | 0.4 | | 1410 | 0.9 |
| | 1848 | 4.2 | | 2014 | 3.5 |
| 12 | 0059 | 0.7 | 27 | 0255 | 1.0 |
| W | 0716 | 4.1 | TH | 0916 | 3.5 |
| | 1345 | 0.6 | | 1524 | 1.1 |
| | 2006 | 3.9 | | 2206 | 3.4 |
| 13 | 0210 | 0.9 | 28 | 0415 | 1.0 |
| TH | 0836 | 3.9 | F | 1046 | 3.6 |
| | 1500 | 0.8 | | 1655 | 1.1 |
| | 2125 | 3.8 | | 2326 | 3.6 |
| 14 | 0335 | 0.9 | 29 | 0535 | 0.8 |
| F | 1006 | 3.9 | SA | 1155 | 3.8 |
| | 1626 | 0.8 | | 1754 | 0.9 |
| | 2246 | 3.8 | | | |
| 15 | 0506 | 0.8 | | | |
| SA | 1118 | 4.1 | | | |
| | 1746 | 0.7 | | | |
| | 2358 | 4.1 | | | |

## MARCH

| | Time | m | | Time | m |
|---|---|---|---|---|---|
| 1 | 0015 | 3.9 | 16 | 0605 | 0.4 |
| SU | 0636 | 0.6 | M | 1208 | 4.4 |
| | 1245 | 4.1 | | 1832 | 0.5 |
| | 1844 | 0.8 | | | |
| 2 | 0106 | 4.1 | 17 | 0031 | 4.3 |
| M | 0726 | 0.4 | TU | 0706 | 0.2 |
| | 1321 | 4.3 | | 1252 | 4.7 |
| | 1925 | 0.6 | | 1922 | 0.3 |
| 3 | 0138 | 4.3 | 18 | 0116 | 4.6 |
| TU | 0756 | 0.3 | W | 0749 | 0.0 |
| | 1355 | 4.5 | | 1335 | 4.8 |
| | 1956 | 0.6 | ○ | 2006 | 0.2 |
| 4 | 0206 | 4.5 | 19 | 0156 | 4.8 |
| W | 0825 | 0.2 | TH | 0836 | -0.1 |
| | 1421 | 4.6 | | 1416 | 4.9 |
| ● | 2030 | 0.5 | | 2047 | 0.2 |
| 5 | 0235 | 4.6 | 20 | 0236 | 4.9 |
| TH | 0858 | 0.1 | F | 0915 | -0.1 |
| | 1448 | 4.7 | | 1455 | 4.9 |
| | 2102 | 0.4 | | 2128 | 0.2 |
| 6 | 0302 | 4.7 | 21 | 0317 | 4.9 |
| F | 0932 | 0.1 | SA | 0955 | -0.1 |
| | 1517 | 4.7 | | 1540 | 4.8 |
| | 2136 | 0.4 | | 2208 | 0.2 |
| 7 | 0336 | 4.7 | 22 | 0358 | 4.9 |
| SA | 1005 | 0.1 | SU | 1035 | 0.1 |
| | 1549 | 4.7 | | 1623 | 4.7 |
| | 2210 | 0.4 | | 2248 | 0.3 |
| 8 | 0403 | 4.7 | 23 | 0443 | 4.7 |
| SU | 1036 | 0.2 | M | 1116 | 0.3 |
| | 1620 | 4.6 | | 1705 | 4.4 |
| | 2239 | 0.4 | | 2325 | 0.4 |
| 9 | 0435 | 4.7 | 24 | 0526 | 4.5 |
| M | 1111 | 0.2 | TU | 1150 | 0.5 |
| | 1656 | 4.6 | | 1750 | 4.2 |
| | 2316 | 0.4 | | | |
| 10 | 0513 | 4.6 | 25 | 0006 | 0.5 |
| TU | 1146 | 0.3 | W | 0609 | 4.2 |
| | 1735 | 4.4 | | 1230 | 0.7 |
| | 2356 | 0.5 | | 1835 | 3.8 |
| 11 | 0556 | 4.5 | 26 | 0055 | 0.7 |
| W | 1226 | 0.4 | TH | 0706 | 3.8 |
| | 1822 | 4.2 | | 1330 | 1.0 |
| | | | | 1936 | 3.5 |
| 12 | 0046 | 0.6 | 27 | 0215 | 0.9 |
| TH | 0648 | 4.2 | F | 0826 | 3.5 |
| | 1326 | 0.6 | | 1444 | 1.1 |
| | 1936 | 3.9 | | 2054 | 3.3 |
| 13 | 0149 | 0.7 | 28 | 0336 | 0.9 |
| F | 0810 | 3.9 | SA | 1006 | 3.5 |
| | 1440 | 0.8 | | 1604 | 1.1 |
| | 2100 | 3.7 | | 2246 | 3.4 |
| 14 | 0314 | 0.8 | 29 | 0450 | 0.8 |
| SA | 0945 | 3.9 | SU | 1121 | 3.7 |
| | 1605 | 0.8 | | 1714 | 0.9 |
| | 2225 | 3.7 | | 2345 | 3.7 |
| 15 | 0455 | 0.7 | 30 | 0606 | 0.6 |
| SU | 1105 | 4.1 | M | 1210 | 4.0 |
| | 1736 | 0.7 | | 1816 | 0.7 |
| | 2339 | 4.0 | | | |
| | | | 31 | 0025 | 4.0 |
| | | | TU | 0646 | 0.4 |
| | | | | 1248 | 4.3 |
| | | | | 1855 | 0.6 |

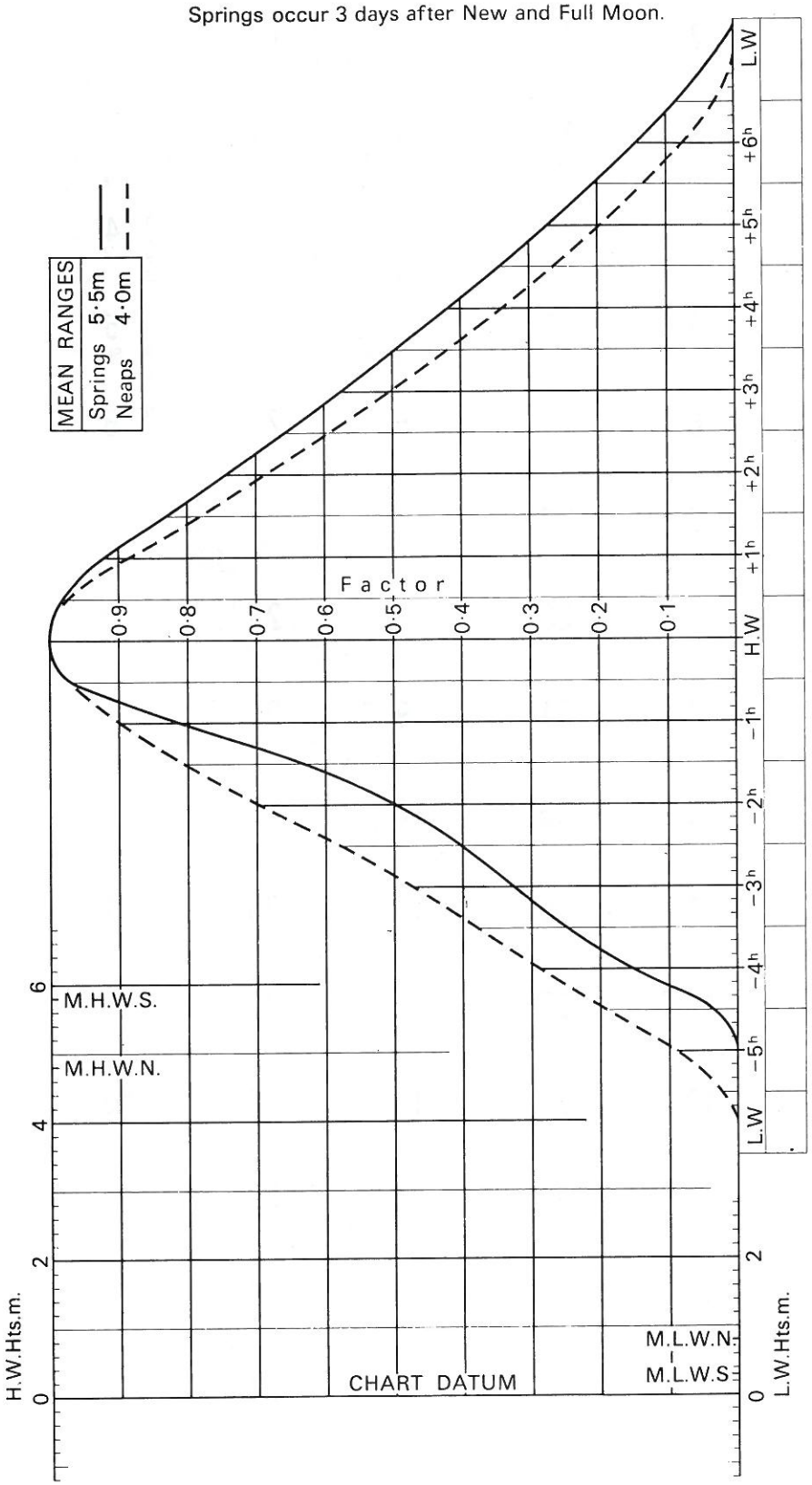
## APRIL

| | Time | m | | Time | m |
|---|---|---|---|---|---|
| 1 | 0101 | 4.3 | 16 | 0053 | 4.5 |
| W | 0722 | 0.3 | TH | 0729 | 0.0 |
| | 1319 | 4.5 | | 1316 | 4.7 |
| | 1926 | 0.5 | | 1945 | 0.3 |
| 2 | 0131 | 4.4 | 17 | 0135 | 4.7 |
| TH | 0756 | 0.2 | F | 0812 | 0.0 |
| | 1349 | 4.6 | | 1356 | 4.8 |
| | 1959 | 0.4 | ○ | 2026 | 0.2 |
| 3 | 0159 | 4.6 | 18 | 0215 | 4.8 |
| F | 0825 | 0.1 | SA | 0852 | 0.0 |
| | 1417 | 4.7 | | 1436 | 4.7 |
| ● | 2035 | 0.3 | | 2106 | 0.2 |
| 4 | 0230 | 4.7 | 19 | 0256 | 4.8 |
| SA | 0902 | 0.1 | SU | 0930 | 0.1 |
| | 1449 | 4.7 | | 1519 | 4.7 |
| | 2110 | 0.3 | | 2145 | 0.2 |
| 5 | 0305 | 4.8 | 20 | 0336 | 4.8 |
| SU | 0935 | 0.1 | M | 1008 | 0.2 |
| | 1522 | 4.7 | | 1601 | 4.5 |
| | 2145 | 0.3 | | 2226 | 0.2 |
| 6 | 0336 | 4.8 | 21 | 0420 | 4.6 |
| M | 1012 | 0.2 | TU | 1045 | 0.4 |
| | 1556 | 4.7 | | 1638 | 4.3 |
| | 2222 | 0.3 | | 2302 | 0.3 |
| 7 | 0413 | 4.8 | 22 | 0458 | 4.4 |
| TU | 1048 | 0.2 | W | 1119 | 0.6 |
| | 1636 | 4.6 | | 1718 | 4.1 |
| | 2306 | 0.3 | | 2345 | 0.4 |
| 8 | 0452 | 4.7 | 23 | 0545 | 4.2 |
| W | 1126 | 0.3 | TH | 1200 | 0.7 |
| | 1717 | 4.4 | | 1805 | 3.9 |
| | 2346 | 0.3 | | | |
| 9 | 0537 | 4.5 | 24 | 0036 | 0.6 |
| TH | 1212 | 0.4 | F | 0636 | 3.9 |
| | 1809 | 4.1 | | 1256 | 0.9 |
| | | | | 1856 | 3.7 |
| 10 | 0035 | 0.4 | 25 | 0146 | 0.7 |
| F | 0635 | 4.2 | SA | 0746 | 3.7 |
| | 1304 | 0.6 | | 1416 | 1.1 |
| | 1926 | 3.8 | | 2000 | 3.5 |
| 11 | 0145 | 0.6 | 26 | 0255 | 0.8 |
| SA | 0806 | 4.0 | SU | 0906 | 3.5 |
| | 1426 | 0.8 | | 1526 | 1.0 |
| | 2048 | 3.7 | | 2124 | 3.4 |
| 12 | 0315 | 0.6 | 27 | 0355 | 0.7 |
| SU | 0930 | 4.0 | M | 1026 | 3.7 |
| | 1555 | 0.8 | | 1630 | 0.9 |
| | 2205 | 3.8 | | 2256 | 3.6 |
| 13 | 0440 | 0.5 | 28 | 0506 | 0.6 |
| M | 1048 | 4.2 | TU | 1122 | 3.9 |
| | 1726 | 0.7 | | 1725 | 0.8 |
| | 2318 | 4.0 | | 2342 | 3.9 |
| 14 | 0556 | 0.3 | 29 | 0606 | 0.5 |
| TU | 1145 | 4.4 | W | 1205 | 4.2 |
| | 1818 | 0.5 | | 1816 | 0.6 |
| | | | | | |
| 15 | 0009 | 4.3 | 30 | 0020 | 4.2 |
| W | 0645 | 0.1 | TH | 0646 | 0.3 |
| | 1235 | 4.6 | | 1239 | 4.4 |
| | 1902 | 0.3 | | 1856 | 0.5 |

# ANTWERP (PROSPERPOLDER)

MEAN SPRING AND NEAP CURVES

Springs occur 3 days after New and Full Moon.



# BELGIUM - ANTWERP (PROSPERPOLDER)

LAT 51°21'N LONG 4°14'E

TIME ZONE -0100

TIMES AND HEIGHTS OF HIGH AND LOW WATERS

YEAR 1992

## JANUARY

| | Time | m | | Time | m |
|---|---|---|---|---|---|
| 1 | 0021 | 5.0 | 16 | 0527 | 1.0 |
| W | 0657 | 0.9 | TH | 1139 | 5.0 |
| | 1248 | 5.0 | | 1811 | 0.9 |
| | 1926 | 0.6 | | | |
| 2 | 0119 | 5.1 | 17 | 0021 | 5.1 |
| TH | 0801 | 0.8 | F | 0645 | 0.9 |
| | 1344 | 5.2 | | 1250 | 5.2 |
| | 2019 | 0.6 | | 1924 | 0.7 |
| 3 | 0211 | 5.3 | 18 | 0127 | 5.4 |
| F | 0849 | 0.6 | SA | 0757 | 0.7 |
| | 1432 | 5.4 | | 1354 | 5.6 |
| | 2101 | 0.6 | | 2029 | 0.6 |
| 4 | 0256 | 5.4 | 19 | 0225 | 5.6 |
| SA | 0931 | 0.6 | SU | 0901 | 0.5 |
| | 1515 | 5.5 | | 1449 | 5.9 |
| ● | 2139 | 0.7 | O | 2127 | 0.5 |
| 5 | 0335 | 5.5 | 20 | 0315 | 5.9 |
| SU | 1010 | 0.5 | M | 0959 | 0.2 |
| | 1553 | 5.7 | | 1538 | 6.2 |
| | 2214 | 0.7 | | 2219 | 0.4 |
| 6 | 0410 | 5.6 | 21 | 0403 | 6.0 |
| M | 1045 | 0.5 | TU | 1051 | 0.0 |
| | 1628 | 5.7 | | 1626 | 6.3 |
| | 2248 | 0.7 | | 2308 | 0.4 |
| 7 | 0444 | 5.7 | 22 | 0449 | 6.1 |
| TU | 1119 | 0.5 | W | 1140 | -0.2 |
| | 1701 | 5.8 | | 1712 | 6.4 |
| | 2320 | 0.7 | | 2354 | 0.4 |
| 8 | 0516 | 5.8 | 23 | 0534 | 6.2 |
| W | 1151 | 0.4 | TH | 1227 | -0.3 |
| | 1733 | 5.8 | | 1758 | 6.3 |
| | 2353 | 0.6 | | | |
| 9 | 0549 | 5.8 | 24 | 0038 | 0.5 |
| TH | 1222 | 0.4 | F | 0619 | 6.1 |
| | 1807 | 5.8 | | 1310 | -0.3 |
| | | | | 1846 | 6.1 |
| 10 | 0027 | 0.6 | 25 | 0119 | 0.5 |
| F | 0622 | 5.7 | SA | 0706 | 5.9 |
| | 1252 | 0.4 | | 1351 | -0.1 |
| | 1841 | 5.7 | | 1934 | 5.8 |
| 11 | 0100 | 0.7 | 26 | 0201 | 0.6 |
| SA | 0656 | 5.5 | SU | 0754 | 5.6 |
| | 1324 | 0.5 | | 1433 | 0.1 |
| | 1917 | 5.5 | | 2023 | 5.4 |
| 12 | 0137 | 0.7 | 27 | 0243 | 0.7 |
| SU | 0733 | 5.4 | M | 0846 | 5.3 |
| | 1401 | 0.6 | | 1517 | 0.3 |
| | 1958 | 5.3 | | 2119 | 5.0 |
| 13 | 0218 | 0.8 | 28 | 0334 | 0.8 |
| M | 0818 | 5.2 | TU | 0948 | 4.9 |
| | 1442 | 0.6 | | 1610 | 0.6 |
| | 2051 | 5.1 | | 2228 | 4.7 |
| 14 | 0305 | 0.9 | 29 | 0438 | 1.0 |
| TU | 0915 | 5.0 | W | 1106 | 4.6 |
| | 1535 | 0.8 | | 1718 | 0.9 |
| | 2157 | 5.0 | | 2349 | 4.6 |
| 15 | 0407 | 1.0 | 30 | 0610 | 1.0 |
| W | 1027 | 4.9 | TH | 1222 | 4.7 |
| | 1647 | 0.9 | | 1848 | 0.9 |
| | 2309 | 5.0 | | | |
| | | | 31 | 0056 | 4.8 |
| | | | F | 0735 | 0.8 |
| | | | | 1324 | 5.0 |
| | | | | 1952 | 0.7 |

## FEBRUARY

| | Time | m | | Time | m |
|---|---|---|---|---|---|
| 1 | 0152 | 5.1 | 16 | 0113 | 5.1 |
| SA | 0829 | 0.5 | SU | 0742 | 0.5 |
| | 1416 | 5.3 | | 1342 | 5.5 |
| | 2040 | 0.6 | | 2018 | 0.5 |
| 2 | 0239 | 5.4 | 17 | 0213 | 5.4 |
| SU | 0912 | 0.4 | M | 0851 | 0.2 |
| | 1500 | 5.6 | | 1437 | 5.9 |
| | 2119 | 0.5 | | 2117 | 0.4 |
| 3 | 0319 | 5.6 | 18 | 0303 | 5.8 |
| M | 0950 | 0.3 | TU | 0948 | -0.1 |
| | 1538 | 5.7 | | 1525 | 6.2 |
| ● | 2156 | 0.5 | O | 2207 | 0.3 |
| 4 | 0353 | 5.7 | 19 | 0348 | 6.0 |
| TU | 1027 | 0.3 | W | 1037 | -0.4 |
| | 1610 | 5.8 | | 1610 | 6.4 |
| | 2230 | 0.5 | | 2254 | 0.2 |
| 5 | 0426 | 5.8 | 20 | 0430 | 6.2 |
| W | 1059 | 0.2 | TH | 1123 | -0.5 |
| | 1641 | 5.9 | | 1654 | 6.4 |
| | 2302 | 0.5 | | 2337 | 0.2 |
| 6 | 0457 | 5.9 | 21 | 0512 | 6.2 |
| TH | 1132 | 0.2 | F | 1205 | -0.5 |
| | 1712 | 6.0 | | 1736 | 6.3 |
| | 2334 | 0.4 | | | |
| 7 | 0526 | 5.9 | 22 | 0018 | 0.2 |
| F | 1201 | 0.2 | SA | 0554 | 6.1 |
| | 1743 | 6.0 | | 1246 | -0.4 |
| | | | | 1818 | 6.0 |
| 8 | 0008 | 0.4 | 23 | 0055 | 0.3 |
| SA | 0557 | 5.9 | SU | 0636 | 5.9 |
| | 1232 | 0.3 | | 1321 | -0.1 |
| | 1814 | 5.8 | | 1900 | 5.7 |
| 9 | 0042 | 0.5 | 24 | 0131 | 0.4 |
| SU | 0628 | 5.7 | M | 0720 | 5.6 |
| | 1303 | 0.4 | | 1357 | 0.2 |
| | 1848 | 5.7 | | 1944 | 5.3 |
| 10 | 0114 | 0.6 | 25 | 0208 | 0.5 |
| M | 0703 | 5.6 | TU | 0805 | 5.2 |
| | 1334 | 0.4 | | 1434 | 0.4 |
| | 1927 | 5.5 | | 2030 | 4.9 |
| 11 | 0151 | 0.6 | 26 | 0251 | 0.7 |
| TU | 0744 | 5.4 | W | 0900 | 4.8 |
| | 1412 | 0.5 | | 1522 | 0.7 |
| | 2013 | 5.3 | | 2132 | 4.5 |
| 12 | 0234 | 0.7 | 27 | 0352 | 0.9 |
| W | 0836 | 5.2 | TH | 1019 | 4.4 |
| | 1500 | 0.7 | | 1630 | 1.0 |
| | 2117 | 5.0 | | 2305 | 4.2 |
| 13 | 0332 | 0.8 | 28 | 0518 | 1.0 |
| TH | 0946 | 4.9 | F | 1153 | 4.5 |
| | 1610 | 0.9 | | 1800 | 1.0 |
| | 2231 | 4.8 | | | |
| 14 | 0455 | 0.9 | 29 | 0027 | 4.5 |
| F | 1106 | 4.8 | SA | 0657 | 0.8 |
| | 1743 | 0.9 | | 1300 | 4.9 |
| | 2354 | 4.8 | | 1920 | 0.7 |
| 15 | 0621 | 0.8 | | | |
| SA | 1234 | 5.0 | | | |
| | 1906 | 0.7 | | | |

## MARCH

| | Time | m | | Time | m |
|---|---|---|---|---|---|
| 1 | 0127 | 4.9 | 16 | 0059 | 5.0 |
| SU | 0759 | 0.4 | M | 0731 | 0.3 |
| | 1352 | 5.3 | | 1330 | 5.5 |
| | 2012 | 0.5 | | 2006 | 0.5 |
| 2 | 0215 | 5.3 | 17 | 0157 | 5.4 |
| M | 0846 | 0.2 | TU | 0839 | 0.0 |
| | 1436 | 5.6 | | 1422 | 5.9 |
| | 2056 | 0.3 | | 2103 | 0.3 |
| 3 | 0254 | 5.6 | 18 | 0243 | 5.7 |
| TU | 0925 | 0.1 | W | 0931 | -0.3 |
| | 1512 | 5.8 | | 1507 | 6.2 |
| | 2134 | 0.3 | O | 2150 | 0.2 |
| 4 | 0328 | 5.7 | 19 | 0327 | 6.0 |
| W | 1002 | 0.1 | TH | 1017 | -0.5 |
| | 1545 | 5.9 | | 1549 | 6.3 |
| ● | 2207 | 0.3 | | 2234 | 0.1 |
| 5 | 0359 | 5.9 | 20 | 0406 | 6.1 |
| TH | 1034 | 0.1 | F | 1101 | -0.5 |
| | 1614 | 6.0 | | 1630 | 6.2 |
| | 2240 | 0.3 | | 2315 | 0.1 |
| 6 | 0428 | 6.0 | 21 | 0447 | 6.2 |
| F | 1105 | 0.1 | SA | 1140 | -0.4 |
| | 1642 | 6.1 | | 1709 | 6.1 |
| | 2313 | 0.3 | | 2353 | 0.1 |
| 7 | 0458 | 6.0 | 22 | 0527 | 6.1 |
| SA | 1137 | 0.1 | SU | 1217 | -0.2 |
| | 1713 | 6.0 | | 1749 | 5.9 |
| | 2347 | 0.3 | | | |
| 8 | 0529 | 6.0 | 23 | 0029 | 0.2 |
| SU | 1210 | 0.2 | M | 0607 | 5.9 |
| | 1746 | 5.9 | | 1249 | 0.1 |
| | | | | 1828 | 5.5 |
| 9 | 0021 | 0.3 | 24 | 0102 | 0.3 |
| M | 0601 | 5.8 | TU | 0646 | 5.5 |
| | 1241 | 0.3 | | 1321 | 0.3 |
| | 1821 | 5.8 | | 1906 | 5.2 |
| 10 | 0055 | 0.4 | 25 | 0137 | 0.5 |
| TU | 0638 | 5.7 | W | 0727 | 5.2 |
| | 1313 | 0.4 | | 1355 | 0.6 |
| | 1900 | 5.6 | | 1947 | 4.8 |
| 11 | 0130 | 0.5 | 26 | 0215 | 0.6 |
| W | 0719 | 5.5 | TH | 0816 | 4.8 |
| | 1348 | 0.5 | | 1437 | 0.8 |
| | 1948 | 5.3 | | 2040 | 4.5 |
| 12 | 0212 | 0.5 | 27 | 0307 | 0.8 |
| TH | 0811 | 5.3 | F | 0928 | 4.4 |
| | 1436 | 0.6 | | 1542 | 1.0 |
| | 2049 | 4.9 | | 2203 | 4.2 |
| 13 | 0311 | 0.7 | 28 | 0431 | 1.0 |
| F | 0921 | 5.0 | SA | 1106 | 4.4 |
| | 1549 | 0.9 | | 1716 | 1.1 |
| | 2206 | 4.7 | | 2344 | 4.3 |
| 14 | 0435 | 0.7 | 29 | 0604 | 0.8 |
| SA | 1047 | 4.8 | SU | 1224 | 4.8 |
| | 1726 | 0.9 | | 1838 | 0.8 |
| | 2337 | 4.6 | | | |
| 15 | 0604 | 0.6 | 30 | 0050 | 4.8 |
| SU | 1222 | 5.1 | M | 0716 | 0.5 |
| | 1855 | 0.7 | | 1319 | 5.3 |
| | | | | 1937 | 0.4 |
| | | | 31 | 0140 | 5.2 |
| | | | TU | 0809 | 0.2 |
| | | | | 1404 | 5.6 |
| | | | | 2025 | 0.3 |

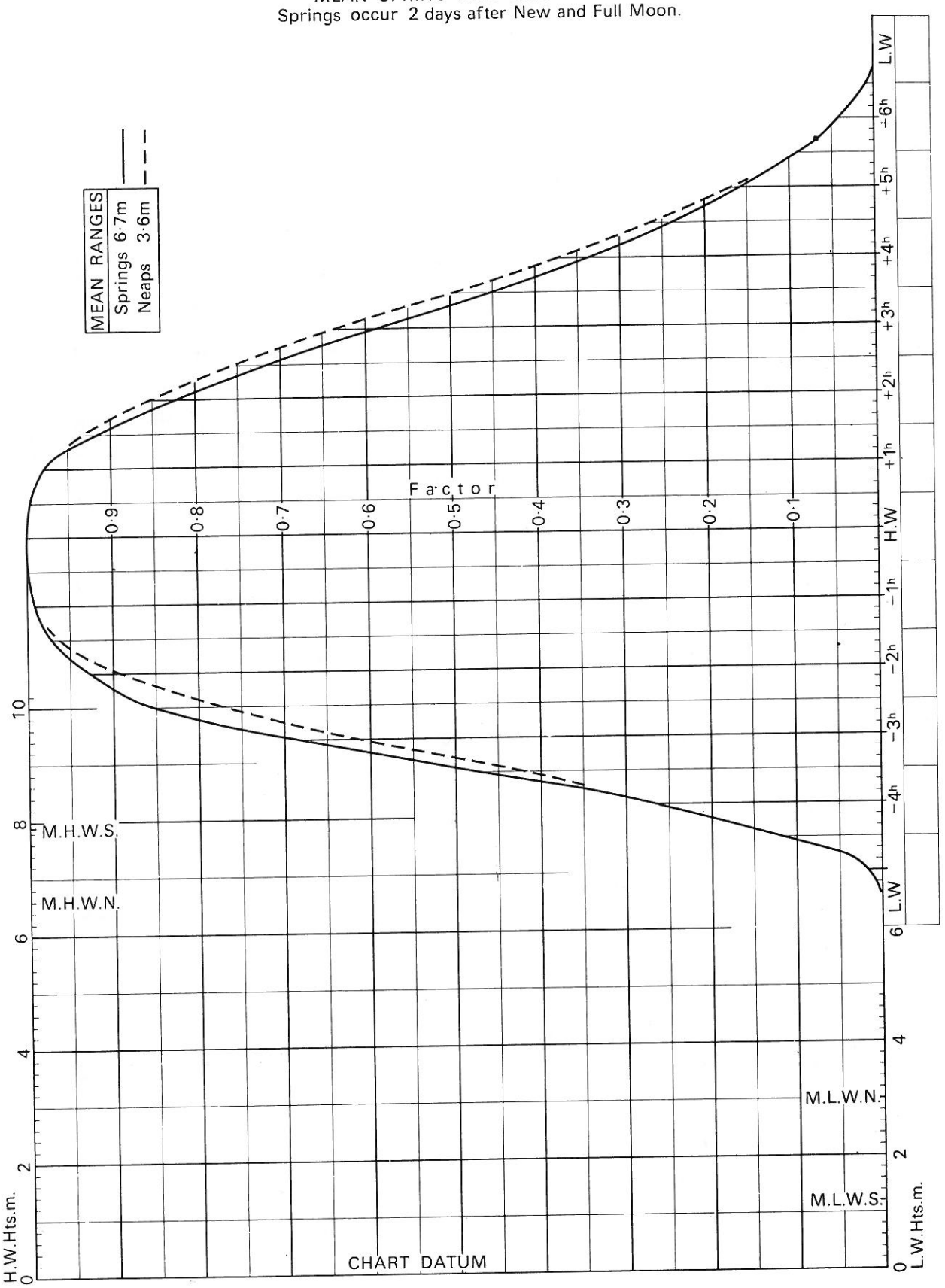
## APRIL

| | Time | m | | Time | m |
|---|---|---|---|---|---|
| 1 | 0220 | 5.5 | 16 | 0220 | 5.7 |
| W | 0853 | 0.1 | TH | 0910 | -0.3 |
| | 1440 | 5.8 | | 1444 | 6.0 |
| | 2104 | 0.2 | | 2129 | 0.2 |
| 2 | 0256 | 5.7 | 17 | 0303 | 5.9 |
| TH | 0929 | 0.1 | F | 0955 | -0.3 |
| | 1512 | 5.9 | | 1525 | 6.0 |
| | 2138 | 0.2 | O | 2212 | 0.1 |
| 3 | 0327 | 5.9 | 18 | 0342 | 6.0 |
| F | 1002 | 0.1 | SA | 1035 | -0.2 |
| | 1542 | 6.0 | | 1604 | 6.0 |
| ● | 2212 | 0.2 | | 2251 | 0.1 |
| 4 | 0356 | 6.0 | 19 | 0423 | 6.1 |
| SA | 1035 | 0.2 | SU | 1112 | -0.1 |
| | 1613 | 6.1 | | 1644 | 5.9 |
| | 2248 | 0.2 | | 2329 | 0.1 |
| 5 | 0428 | 6.1 | 20 | 0502 | 6.0 |
| SU | 1109 | 0.2 | M | 1146 | 0.1 |
| | 1647 | 6.1 | | 1722 | 5.7 |
| | 2325 | 0.2 | | | |
| 6 | 0502 | 6.1 | 21 | 0003 | 0.2 |
| M | 1146 | 0.2 | TU | 0542 | 5.8 |
| | 1722 | 6.0 | | 1218 | 0.3 |
| | | | | 1758 | 5.5 |
| 7 | 0003 | 0.3 | 22 | 0036 | 0.4 |
| TU | 0537 | 6.0 | W | 0619 | 5.5 |
| | 1221 | 0.3 | | 1249 | 0.5 |
| | 1800 | 5.8 | | 1835 | 5.2 |
| 8 | 0039 | 0.3 | 23 | 0109 | 0.5 |
| W | 0617 | 5.9 | TH | 0659 | 5.3 |
| | 1255 | 0.4 | | 1321 | 0.6 |
| | 1842 | 5.6 | | 1914 | 5.0 |
| 9 | 0117 | 0.4 | 24 | 0144 | 0.6 |
| TH | 0702 | 5.7 | F | 0744 | 5.0 |
| | 1334 | 0.5 | | 1401 | 0.8 |
| | 1931 | 5.3 | | 2005 | 4.7 |
| 10 | 0202 | 0.4 | 25 | 0227 | 0.7 |
| F | 0758 | 5.4 | SA | 0846 | 4.7 |
| | 1425 | 0.7 | | 1451 | 0.9 |
| | 2034 | 4.9 | | 2115 | 4.4 |
| 11 | 0304 | 0.5 | 26 | 0332 | 0.8 |
| SA | 0910 | 5.1 | SU | 1002 | 4.6 |
| | 1541 | 0.8 | | 1619 | 1.0 |
| | 2152 | 4.7 | | 2237 | 4.4 |
| 12 | 0427 | 0.5 | 27 | 0508 | 0.8 |
| SU | 1038 | 5.0 | M | 1126 | 4.8 |
| | 1712 | 0.8 | | 1746 | 0.8 |
| | 2322 | 4.7 | | 2357 | 4.7 |
| 13 | 0550 | 0.4 | 28 | 0622 | 0.6 |
| M | 1207 | 5.2 | TU | 1231 | 5.1 |
| | 1838 | 0.6 | | 1852 | 0.6 |
| 14 | 0038 | 5.0 | 29 | 0055 | 5.1 |
| TU | 0714 | 0.1 | W | 0723 | 0.4 |
| | 1310 | 5.6 | | 1320 | 5.5 |
| | 1948 | 0.4 | | 1944 | 0.4 |
| 15 | 0134 | 5.4 | 30 | 0140 | 5.4 |
| W | 0818 | -0.2 | TH | 0811 | 0.3 |
| | 1401 | 5.9 | | 1359 | 5.7 |
| | 2043 | 0.2 | | 2026 | 0.3 |

# LE HAVRE

MEAN SPRING AND NEAP CURVES

Springs occur 2 days after New and Full Moon.



# FRANCE, NORTH COAST - LE HAVRE

**LAT 49°29'N LONG 0°07'E**

TIME ZONE **-0100** TIMES AND HEIGHTS OF HIGH AND LOW WATERS YEAR **1992**

## JANUARY

| | Time | m | | Time | m |
|---|---|---|---|---|---|
| **1** | 0224 | 2.8 | **16** | 0059 | 2.9 |
| W | 0808 | 6.9 | TH | 0656 | 6.7 |
| | 1459 | 2.6 | | 1353 | 2.7 |
| | 2042 | 6.8 | | 1936 | 6.7 |
| **2** | 0325 | 2.6 | **17** | 0229 | 2.6 |
| TH | 0902 | 7.1 | F | 0806 | 7.0 |
| | 1555 | 2.4 | | 1511 | 2.2 |
| | 2132 | 7.0 | | 2044 | 7.1 |
| **3** | 0416 | 2.4 | **18** | 0340 | 2.1 |
| F | 0946 | 7.3 | SA | 0906 | 7.4 |
| | 1642 | 2.1 | | 1616 | 1.7 |
| | 2214 | 7.2 | | 2142 | 7.5 |
| **4** | 0500 | 2.2 | **19** | 0442 | 1.7 |
| SA | 1024 | 7.4 | SU | 1000 | 7.7 |
| | 1723 | 1.9 | | 1717 | 1.2 |
| ● | 2251 | 7.3 | O | 2234 | 7.8 |
| **5** | 0540 | 2.0 | **20** | 0542 | 1.3 |
| SU | 1058 | 7.5 | M | 1051 | 8.0 |
| | 1801 | 1.7 | | 1815 | 0.9 |
| | 2323 | 7.4 | | 2324 | 8.0 |
| **6** | 0618 | 1.9 | **21** | 0637 | 1.0 |
| M | 1131 | 7.6 | TU | 1139 | 8.1 |
| | 1838 | 1.6 | | 1906 | 0.6 |
| | 2356 | 7.4 | | | |
| **7** | 0653 | 1.9 | **22** | 0011 | 8.1 |
| TU | 1204 | 7.6 | W | 0726 | 0.9 |
| | 1911 | 1.6 | | 1226 | 8.2 |
| | | | | 1952 | 0.6 |
| **8** | 0028 | 7.4 | **23** | 0057 | 8.1 |
| W | 0725 | 1.9 | TH | 0810 | 0.9 |
| | 1236 | 7.5 | | 1311 | 8.1 |
| | 1942 | 1.7 | | 2033 | 0.8 |
| **9** | 0100 | 7.4 | **24** | 0141 | 7.9 |
| TH | 0756 | 2.0 | F | 0849 | 1.2 |
| | 1308 | 7.5 | | 1354 | 7.9 |
| | 2012 | 1.8 | | 2110 | 1.2 |
| **10** | 0131 | 7.3 | **25** | 0223 | 7.6 |
| F | 0826 | 2.1 | SA | 0926 | 1.6 |
| | 1341 | 7.3 | | 1437 | 7.5 |
| | 2042 | 2.0 | | 2145 | 1.7 |
| **11** | 0205 | 7.2 | **26** | 0305 | 7.3 |
| SA | 0857 | 2.3 | SU | 1003 | 2.1 |
| | 1416 | 7.2 | | 1521 | 7.1 |
| | 2113 | 2.2 | | 2221 | 2.3 |
| **12** | 0241 | 7.0 | **27** | 0352 | 6.9 |
| SU | 0933 | 2.5 | M | 1044 | 2.6 |
| | 1456 | 6.9 | | 1615 | 6.7 |
| | 2150 | 2.5 | | 2307 | 2.8 |
| **13** | 0324 | 6.8 | **28** | 0453 | 6.6 |
| M | 1016 | 2.8 | TU | 1140 | 3.0 |
| | 1544 | 6.7 | | 1729 | 6.3 |
| | 2237 | 2.7 | | | |
| **14** | 0417 | 6.7 | **29** | 0014 | 3.2 |
| TU | 1112 | 2.9 | W | 0615 | 6.4 |
| | 1647 | 6.6 | | 1300 | 3.2 |
| | 2339 | 2.9 | | 1909 | 6.2 |
| **15** | 0530 | 6.6 | **30** | 0142 | 3.3 |
| W | 1224 | 3.0 | TH | 0743 | 6.5 |
| | 1814 | 6.5 | | 1426 | 3.0 |
| | | | | 2026 | 6.4 |
| | | | **31** | 0259 | 3.0 |
| | | | F | 0845 | 6.7 |
| | | | | 1534 | 2.6 |
| | | | | 2119 | 6.7 |

## FEBRUARY

| | Time | m | | Time | m |
|---|---|---|---|---|---|
| **1** | 0400 | 2.6 | **16** | 0325 | 2.2 |
| SA | 0931 | 7.0 | SU | 0854 | 7.3 |
| | 1627 | 2.2 | | 1603 | 1.7 |
| | 2159 | 7.0 | | 2131 | 7.5 |
| **2** | 0448 | 2.2 | **17** | 0433 | 1.6 |
| SU | 1008 | 7.3 | M | 0949 | 7.7 |
| | 1710 | 1.9 | | 1708 | 1.1 |
| | 2233 | 7.3 | | 2222 | 7.8 |
| **3** | 0528 | 1.9 | **18** | 0534 | 1.1 |
| M | 1040 | 7.5 | TU | 1038 | 8.0 |
| | 1748 | 1.6 | | 1804 | 0.7 |
| ● | 2303 | 7.4 | O | 2308 | 8.1 |
| **4** | 0605 | 1.7 | **19** | 0625 | 0.8 |
| TU | 1111 | 7.6 | W | 1123 | 8.2 |
| | 1823 | 1.5 | | 1851 | 0.4 |
| | 2334 | 7.5 | | 2352 | 8.2 |
| **5** | 0638 | 1.6 | **20** | 0710 | 0.6 |
| W | 1143 | 7.7 | TH | 1207 | 8.3 |
| | 1854 | 1.4 | | 1932 | 0.4 |
| **6** | 0005 | 7.6 | **21** | 0034 | 8.1 |
| TH | 0708 | 1.5 | F | 0749 | 0.7 |
| | 1215 | 7.7 | | 1249 | 8.2 |
| | 1923 | 1.4 | | 2009 | 0.7 |
| **7** | 0035 | 7.6 | **22** | 0114 | 8.0 |
| F | 0736 | 1.6 | SA | 0824 | 1.0 |
| | 1246 | 7.7 | | 1329 | 7.9 |
| | 1952 | 1.4 | | 2042 | 1.1 |
| **8** | 0106 | 7.5 | **23** | 0152 | 7.7 |
| SA | 0805 | 1.7 | SU | 0856 | 1.4 |
| | 1317 | 7.6 | | 1407 | 7.5 |
| | 2020 | 1.6 | | 2111 | 1.7 |
| **9** | 0138 | 7.4 | **24** | 0228 | 7.3 |
| SU | 0835 | 1.8 | M | 0926 | 2.0 |
| | 1351 | 7.4 | | 1446 | 7.1 |
| | 2049 | 1.8 | | 2140 | 2.3 |
| **10** | 0210 | 7.2 | **25** | 0307 | 6.9 |
| M | 0907 | 2.1 | TU | 1000 | 2.5 |
| | 1426 | 7.2 | | 1533 | 6.6 |
| | 2121 | 2.2 | | 2219 | 2.9 |
| **11** | 0246 | 7.0 | **26** | 0401 | 6.5 |
| TU | 0942 | 2.4 | W | 1049 | 3.0 |
| | 1508 | 6.9 | | 1643 | 6.1 |
| | 2200 | 2.5 | | 2321 | 3.4 |
| **12** | 0333 | 6.8 | **27** | 0525 | 6.1 |
| W | 1028 | 2.7 | TH | 1207 | 3.4 |
| | 1607 | 6.5 | | 1833 | 6.0 |
| | 2258 | 2.9 | | | |
| **13** | 0444 | 6.5 | **28** | 0059 | 3.6 |
| TH | 1144 | 3.0 | F | 0709 | 6.1 |
| | 1743 | 6.4 | | 1347 | 3.3 |
| | | | | 2001 | 6.2 |
| **14** | 0022 | 3.1 | **29** | 0230 | 3.2 |
| F | 0627 | 6.5 | SA | 0820 | 6.4 |
| | 1323 | 2.8 | | 1505 | 2.8 |
| | 1919 | 6.6 | | 2056 | 6.6 |
| **15** | 0207 | 2.8 | | | |
| SA | 0749 | 6.8 | | | |
| | 1452 | 2.3 | | | |
| | 2032 | 7.0 | | | |

## MARCH

| | Time | m | | Time | m |
|---|---|---|---|---|---|
| **1** | 0337 | 2.7 | **16** | 0312 | 2.1 |
| SU | 0907 | 6.8 | M | 0839 | 7.3 |
| | 1602 | 2.3 | | 1549 | 1.6 |
| | 2134 | 6.9 | | 2115 | 7.5 |
| **2** | 0427 | 2.2 | **17** | 0419 | 1.5 |
| M | 0942 | 7.1 | TU | 0932 | 7.7 |
| | 1647 | 1.9 | | 1652 | 1.1 |
| | 2206 | 7.2 | | 2202 | 7.8 |
| **3** | 0507 | 1.8 | **18** | 0517 | 1.0 |
| TU | 1014 | 7.4 | W | 1019 | 8.0 |
| | 1726 | 1.6 | | 1744 | 0.7 |
| | 2236 | 7.4 | O | 2246 | 8.0 |
| **4** | 0543 | 1.6 | **19** | 0605 | 0.8 |
| W | 1046 | 7.6 | TH | 1102 | 8.1 |
| | 1800 | 1.4 | | 1828 | 0.5 |
| ● | 2307 | 7.6 | | 2328 | 8.1 |
| **5** | 0615 | 1.4 | **20** | 0647 | 0.7 |
| TH | 1118 | 7.7 | F | 1144 | 8.1 |
| | 1830 | 1.3 | | 1907 | 0.6 |
| | 2338 | 7.7 | | | |
| **6** | 0644 | 1.3 | **21** | 0008 | 8.1 |
| F | 1150 | 7.8 | SA | 0723 | 0.8 |
| | 1859 | 1.2 | | 1225 | 8.0 |
| | | | | 1941 | 0.9 |
| **7** | 0009 | 7.7 | **22** | 0046 | 7.9 |
| SA | 0713 | 1.3 | SU | 0756 | 1.0 |
| | 1223 | 7.8 | | 1304 | 7.8 |
| | 1928 | 1.2 | | 2011 | 1.3 |
| **8** | 0041 | 7.7 | **23** | 0122 | 7.7 |
| SU | 0744 | 1.3 | M | 0827 | 1.4 |
| | 1256 | 7.7 | | 1341 | 7.4 |
| | 1958 | 1.4 | | 2039 | 1.8 |
| **9** | 0113 | 7.6 | **24** | 0157 | 7.3 |
| M | 0815 | 1.5 | TU | 0855 | 1.9 |
| | 1331 | 7.5 | | 1419 | 7.0 |
| | 2028 | 1.7 | | 2106 | 2.4 |
| **10** | 0147 | 7.4 | **25** | 0234 | 6.9 |
| TU | 0847 | 1.8 | W | 0926 | 2.4 |
| | 1408 | 7.2 | | 1503 | 6.5 |
| | 2100 | 2.1 | | 2143 | 2.9 |
| **11** | 0223 | 7.2 | **26** | 0322 | 6.4 |
| W | 0922 | 2.2 | TH | 1010 | 2.9 |
| | 1452 | 6.8 | | 1606 | 6.1 |
| | 2139 | 2.5 | | 2242 | 3.4 |
| **12** | 0311 | 6.8 | **27** | 0439 | 6.1 |
| TH | 1011 | 2.6 | F | 1122 | 3.3 |
| | 1554 | 6.5 | | 1744 | 5.9 |
| | 2238 | 2.9 | | | |
| **13** | 0426 | 6.5 | **28** | 0014 | 3.6 |
| F | 1124 | 2.9 | SA | 0618 | 6.0 |
| | 1735 | 6.4 | | 1258 | 3.3 |
| | | | | 1913 | 6.1 |
| **14** | 0007 | 3.1 | **29** | 0146 | 3.3 |
| SA | 0613 | 6.5 | SU | 0735 | 6.3 |
| | 1306 | 2.7 | | 1417 | 2.9 |
| | 1907 | 6.6 | | 2014 | 6.5 |
| **15** | 0153 | 2.7 | **30** | 0254 | 2.8 |
| SU | 0734 | 6.8 | M | 0828 | 6.6 |
| | 1436 | 2.2 | | 1518 | 2.4 |
| | 2018 | 7.1 | | 2056 | 6.9 |
| | | | **31** | 0347 | 2.3 |
| | | | TU | 0907 | 7.0 |
| | | | | 1608 | 2.0 |
| | | | | 2130 | 7.2 |

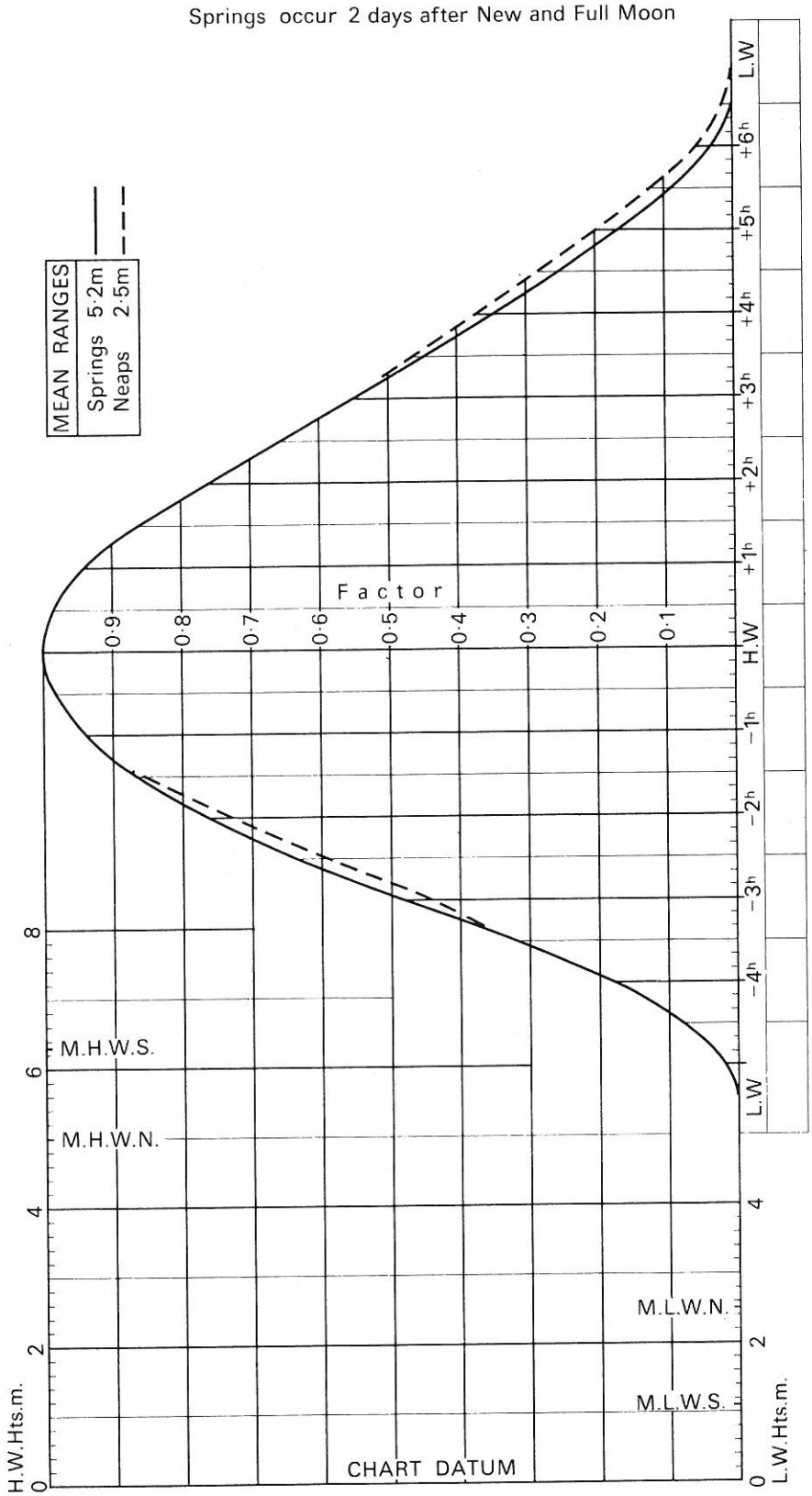
## APRIL

| | Time | m | | Time | m |
|---|---|---|---|---|---|
| **1** | 0431 | 1.9 | **16** | 0451 | 1.2 |
| W | 0942 | 7.3 | TH | 0957 | 7.8 |
| | 1650 | 1.6 | | 1717 | 1.0 |
| | 2203 | 7.4 | | 2222 | 7.9 |
| **2** | 0510 | 1.6 | **17** | 0539 | 1.0 |
| TH | 1016 | 7.5 | F | 1040 | 7.9 |
| | 1727 | 1.4 | | 1759 | 0.9 |
| | 2236 | 7.6 | O | 2303 | 7.9 |
| **3** | 0544 | 1.4 | **18** | 0619 | 0.9 |
| F | 1051 | 7.7 | SA | 1122 | 7.9 |
| | 1759 | 1.3 | | 1837 | 1.0 |
| ● | 2309 | 7.7 | | 2342 | 7.9 |
| **4** | 0616 | 1.3 | **19** | 0655 | 1.0 |
| SA | 1125 | 7.7 | SU | 1203 | 7.8 |
| | 1831 | 1.2 | | 1911 | 1.2 |
| | 2342 | 7.7 | | | |
| **5** | 0649 | 1.2 | **20** | 0019 | 7.8 |
| SU | 1200 | 7.8 | M | 0729 | 1.2 |
| | 1904 | 1.2 | | 1242 | 7.6 |
| | | | | 1942 | 1.5 |
| **6** | 0016 | 7.7 | **21** | 0056 | 7.6 |
| M | 0723 | 1.2 | TU | 0759 | 1.5 |
| | 1237 | 7.7 | | 1320 | 7.3 |
| | 1938 | 1.4 | | 2012 | 1.9 |
| **7** | 0052 | 7.6 | **22** | 0132 | 7.3 |
| TU | 0758 | 1.4 | W | 0829 | 1.9 |
| | 1316 | 7.5 | | 1358 | 7.0 |
| | 2012 | 1.6 | | 2042 | 2.4 |
| **8** | 0131 | 7.4 | **23** | 0209 | 6.9 |
| W | 0833 | 1.6 | TH | 0901 | 2.3 |
| | 1359 | 7.2 | | 1440 | 6.6 |
| | 2047 | 2.0 | | 2118 | 2.8 |
| **9** | 0213 | 7.2 | **24** | 0253 | 6.5 |
| TH | 0912 | 2.0 | F | 0943 | 2.7 |
| | 1448 | 6.9 | | 1534 | 6.3 |
| | 2131 | 2.4 | | 2212 | 3.2 |
| **10** | 0306 | 6.9 | **25** | 0354 | 6.2 |
| F | 1003 | 2.4 | SA | 1044 | 3.1 |
| | 1555 | 6.6 | | 1651 | 6.1 |
| | 2233 | 2.8 | | 2329 | 3.4 |
| **11** | 0423 | 6.6 | **26** | 0520 | 6.1 |
| SA | 1118 | 2.6 | SU | 1203 | 3.1 |
| | 1729 | 6.6 | | 1811 | 6.2 |
| **12** | 0003 | 2.9 | **27** | 0048 | 3.3 |
| SU | 0558 | 6.6 | M | 0635 | 6.2 |
| | 1254 | 2.5 | | 1317 | 2.9 |
| | 1850 | 6.8 | | 1916 | 6.4 |
| **13** | 0136 | 2.5 | **28** | 0156 | 2.9 |
| M | 0714 | 6.9 | TU | 0735 | 6.5 |
| | 1416 | 2.1 | | 1421 | 2.5 |
| | 1957 | 7.2 | | 2007 | 6.8 |
| **14** | 0251 | 2.0 | **29** | 0254 | 2.5 |
| TU | 0817 | 7.3 | W | 0823 | 6.8 |
| | 1525 | 1.6 | | 1515 | 2.2 |
| | 2052 | 7.5 | | 2048 | 7.1 |
| **15** | 0355 | 1.6 | **30** | 0344 | 2.1 |
| W | 0910 | 7.6 | TH | 0905 | 7.1 |
| | 1626 | 1.2 | | 1603 | 1.9 |
| | 2139 | 7.7 | | 2127 | 7.3 |

# CHERBOURG

MEAN SPRING AND NEAP CURVES

Springs occur 2 days after New and Full Moon



# FRANCE, NORTH COAST - CHERBOURG

LAT 49°39'N LONG 1°38'W

TIME ZONE -0100 TIMES AND HEIGHTS OF HIGH AND LOW WATERS YEAR 1992

## JANUARY

| | Time | m | | Time | m |
|---|---|---|---|---|---|
| 1 | 0022 | 2.4 | 16 | 0453 | 5.1 |
| W | 0602 | 5.3 | TH | 1153 | 2.4 |
| | 1255 | 2.3 | | 1735 | 5.2 |
| | 1834 | 5.2 | | | |
| 2 | 0121 | 2.3 | 17 | 0022 | 2.2 |
| TH | 0658 | 5.5 | F | 0606 | 5.5 |
| | 1349 | 2.1 | | 1303 | 2.0 |
| | 1929 | 5.4 | | 1845 | 5.5 |
| 3 | 0210 | 2.1 | 18 | 0128 | 1.9 |
| F | 0744 | 5.7 | SA | 0708 | 5.9 |
| | 1434 | 1.9 | | 1405 | 1.5 |
| | 2013 | 5.6 | | 1944 | 5.9 |
| 4 | 0252 | 1.9 | 19 | 0227 | 1.5 |
| SA | 0825 | 5.9 | SU | 0803 | 6.3 |
| | 1514 | 1.7 | | 1501 | 1.1 |
| ● | 2051 | 5.8 | O | 2038 | 6.3 |
| 5 | 0330 | 1.8 | 20 | 0320 | 1.2 |
| SU | 0901 | 6.0 | M | 0855 | 6.6 |
| | 1551 | 1.5 | | 1552 | 0.7 |
| | 2126 | 5.9 | | 2129 | 6.5 |
| 6 | 0407 | 1.7 | 21 | 0410 | 0.9 |
| M | 0936 | 6.1 | TU | 0944 | 6.8 |
| | 1625 | 1.5 | | 1639 | 0.6 |
| | 2158 | 5.9 | | 2217 | 6.6 |
| 7 | 0439 | 1.7 | 22 | 0458 | 0.8 |
| TU | 1008 | 6.1 | W | 1032 | 6.8 |
| | 1657 | 1.4 | | 1724 | 0.5 |
| | 2229 | 5.9 | | 2303 | 6.6 |
| 8 | 0511 | 1.7 | 23 | 0542 | 0.9 |
| W | 1039 | 6.0 | TH | 1116 | 6.7 |
| | 1729 | 1.5 | | 1808 | 0.7 |
| | 2300 | 5.8 | | 2345 | 6.4 |
| 9 | 0542 | 1.8 | 24 | 0626 | 1.1 |
| TH | 1111 | 5.9 | F | 1158 | 6.5 |
| | 1800 | 1.6 | | 1850 | 1.0 |
| | 2331 | 5.7 | | | |
| 10 | 0613 | 1.9 | 25 | 0025 | 6.1 |
| F | 1143 | 5.8 | SA | 0708 | 1.5 |
| | 1831 | 1.7 | | 1237 | 6.1 |
| | | | | 1931 | 1.5 |
| 11 | 0004 | 5.6 | 26 | 0105 | 5.7 |
| SA | 0647 | 2.1 | SU | 0751 | 1.9 |
| | 1217 | 5.6 | | 1319 | 5.6 |
| | 1906 | 1.9 | | 2014 | 2.0 |
| 12 | 0040 | 5.4 | 27 | 0149 | 5.3 |
| SU | 0726 | 2.2 | M | 0840 | 2.3 |
| | 1255 | 5.4 | | 1408 | 5.1 |
| | 1947 | 2.1 | | 2106 | 2.5 |
| 13 | 0122 | 5.2 | 28 | 0247 | 5.0 |
| M | 0813 | 2.4 | TU | 0944 | 2.7 |
| | 1343 | 5.1 | | 1520 | 4.8 |
| | 2037 | 2.3 | | 2219 | 2.8 |
| 14 | 0217 | 5.1 | 29 | 0409 | 4.8 |
| TU | 0914 | 2.6 | W | 1109 | 2.8 |
| | 1448 | 5.0 | | 1656 | 4.7 |
| | 2144 | 2.5 | | 2348 | 2.8 |
| 15 | 0329 | 5.0 | 30 | 0534 | 4.9 |
| W | 1032 | 2.6 | TH | 1231 | 2.6 |
| | 1611 | 5.0 | | 1820 | 4.9 |
| | 2304 | 2.5 | | | |
| | | | 31 | 0101 | 2.6 |
| | | | F | 0640 | 5.2 |
| | | | | 1333 | 2.3 |
| | | | | 1917 | 5.2 |

## FEBRUARY

| | Time | m | | Time | m |
|---|---|---|---|---|---|
| 1 | 0156 | 2.3 | 16 | 0116 | 2.0 |
| SA | 0729 | 5.5 | SU | 0656 | 5.8 |
| | 1421 | 2.0 | | 1353 | 1.5 |
| | 1959 | 5.5 | | 1935 | 5.9 |
| 2 | 0239 | 2.0 | 17 | 0216 | 1.5 |
| SU | 0810 | 5.8 | M | 0753 | 6.2 |
| | 1500 | 1.7 | | 1447 | 1.0 |
| | 2036 | 5.7 | | 2028 | 6.3 |
| 3 | 0316 | 1.8 | 18 | 0309 | 1.0 |
| M | 0846 | 6.0 | TU | 0844 | 6.6 |
| | 1535 | 1.5 | | 1537 | 0.6 |
| ● | 2109 | 5.9 | O | 2116 | 6.6 |
| 4 | 0350 | 1.6 | 19 | 0356 | 0.8 |
| TU | 0919 | 6.1 | W | 0932 | 6.9 |
| | 1607 | 1.3 | | 1623 | 0.4 |
| | 2140 | 6.0 | | 2201 | 6.7 |
| 5 | 0421 | 1.5 | 20 | 0441 | 0.6 |
| W | 0950 | 6.2 | TH | 1015 | 6.9 |
| | 1637 | 1.2 | | 1705 | 0.4 |
| | 2209 | 6.0 | | 2242 | 6.7 |
| 6 | 0451 | 1.4 | 21 | 0522 | 0.7 |
| TH | 1020 | 6.2 | F | 1056 | 6.8 |
| | 1707 | 1.2 | | 1744 | 0.6 |
| | 2237 | 6.0 | | 2319 | 6.5 |
| 7 | 0520 | 1.4 | 22 | 0600 | 0.9 |
| F | 1050 | 6.2 | SA | 1133 | 6.5 |
| | 1736 | 1.2 | | 1820 | 1.0 |
| | 2307 | 6.0 | | 2353 | 6.2 |
| 8 | 0550 | 1.5 | 23 | 0637 | 1.3 |
| SA | 1120 | 6.0 | SU | 1207 | 6.1 |
| | 1805 | 1.4 | | 1856 | 1.5 |
| | 2336 | 5.8 | | | |
| 9 | 0621 | 1.6 | 24 | 0026 | 5.8 |
| SU | 1149 | 5.8 | M | 0714 | 1.8 |
| | 1836 | 1.6 | | 1242 | 5.6 |
| | | | | 1932 | 2.0 |
| 10 | 0006 | 5.7 | 25 | 0102 | 5.4 |
| M | 0655 | 1.9 | TU | 0756 | 2.2 |
| | 1221 | 5.6 | | 1324 | 5.0 |
| | 1913 | 1.9 | | 2016 | 2.6 |
| 11 | 0040 | 5.4 | 26 | 0152 | 4.9 |
| TU | 0737 | 2.1 | W | 0851 | 2.7 |
| | 1301 | 5.3 | | 1430 | 4.6 |
| | 1958 | 2.2 | | 2123 | 3.0 |
| 12 | 0127 | 5.2 | 27 | 0318 | 4.6 |
| W | 0832 | 2.4 | TH | 1018 | 2.9 |
| | 1401 | 5.0 | | 1624 | 4.4 |
| | 2100 | 2.5 | | 2311 | 3.0 |
| 13 | 0238 | 5.0 | 28 | 0503 | 4.7 |
| TH | 0949 | 2.6 | F | 1159 | 2.7 |
| | 1536 | 4.8 | | 1801 | 4.7 |
| | 2228 | 2.6 | | | |
| 14 | 0421 | 4.9 | 29 | 0038 | 2.8 |
| F | 1124 | 2.4 | SA | 0617 | 5.0 |
| | 1719 | 5.0 | | 1308 | 2.4 |
| | | | | 1856 | 5.0 |
| 15 | 0001 | 2.4 | | | |
| SA | 0550 | 5.3 | | | |
| | 1254 | 2.0 | | | |
| | 1835 | 5.4 | | | |

## MARCH

| | Time | m | | Time | m |
|---|---|---|---|---|---|
| 1 | 0135 | 2.4 | 16 | 0102 | 1.9 |
| SU | 0706 | 5.3 | M | 0642 | 5.7 |
| | 1357 | 2.0 | | 1336 | 1.4 |
| | 1935 | 5.4 | | 1920 | 5.9 |
| 2 | 0218 | 2.0 | 17 | 0200 | 1.4 |
| M | 0746 | 5.7 | TU | 0737 | 6.2 |
| | 1436 | 1.7 | | 1429 | 0.9 |
| | 2010 | 5.7 | | 2010 | 6.3 |
| 3 | 0253 | 1.7 | 18 | 0251 | 1.0 |
| TU | 0822 | 5.9 | W | 0827 | 6.6 |
| | 1510 | 1.4 | | 1517 | 0.6 |
| | 2043 | 5.9 | O | 2055 | 6.6 |
| 4 | 0326 | 1.5 | 19 | 0337 | 0.7 |
| W | 0856 | 6.1 | TH | 0912 | 6.8 |
| | 1541 | 1.2 | | 1600 | 0.5 |
| ● | 2114 | 6.0 | | 2137 | 6.7 |
| 5 | 0357 | 1.3 | 20 | 0418 | 0.6 |
| TH | 0927 | 6.2 | F | 0953 | 6.8 |
| | 1611 | 1.1 | | 1640 | 0.6 |
| | 2144 | 6.1 | | 2215 | 6.6 |
| 6 | 0426 | 1.2 | 21 | 0457 | 0.7 |
| F | 0957 | 6.3 | SA | 1031 | 6.6 |
| | 1641 | 1.0 | | 1716 | 0.8 |
| | 2212 | 6.2 | | 2250 | 6.5 |
| 7 | 0456 | 1.2 | 22 | 0533 | 0.9 |
| SA | 1027 | 6.3 | SU | 1106 | 6.3 |
| | 1710 | 1.1 | | 1750 | 1.2 |
| | 2241 | 6.1 | | 2322 | 6.2 |
| 8 | 0526 | 1.2 | 23 | 0608 | 1.3 |
| SU | 1058 | 6.2 | M | 1139 | 5.9 |
| | 1740 | 1.2 | | 1824 | 1.6 |
| | 2311 | 6.0 | | 2353 | 5.8 |
| 9 | 0558 | 1.4 | 24 | 0643 | 1.7 |
| M | 1128 | 5.9 | TU | 1213 | 5.5 |
| | 1812 | 1.4 | | 1858 | 2.1 |
| | 2340 | 5.8 | | | |
| 10 | 0633 | 1.6 | 25 | 0027 | 5.4 |
| TU | 1201 | 5.7 | W | 0722 | 2.1 |
| | 1848 | 1.8 | | 1252 | 5.0 |
| | | | | 1940 | 2.6 |
| 11 | 0015 | 5.6 | 26 | 0112 | 5.0 |
| W | 0714 | 1.9 | TH | 0812 | 2.6 |
| | 1242 | 5.3 | | 1352 | 4.6 |
| | 1935 | 2.2 | | 2041 | 3.0 |
| 12 | 0102 | 5.2 | 27 | 0229 | 4.6 |
| TH | 0809 | 2.3 | F | 0929 | 2.8 |
| | 1344 | 4.9 | | 1541 | 4.4 |
| | 2039 | 2.5 | | 2234 | 3.1 |
| 13 | 0215 | 4.9 | 28 | 0417 | 4.6 |
| F | 0928 | 2.5 | SA | 1110 | 2.8 |
| | 1525 | 4.8 | | 1718 | 4.6 |
| | 2210 | 2.7 | | 2355 | 2.8 |
| 14 | 0405 | 4.9 | 29 | 0535 | 4.8 |
| SA | 1107 | 2.4 | SU | 1224 | 2.5 |
| | 1712 | 5.0 | | 1816 | 4.9 |
| | 2348 | 2.4 | | | |
| 15 | 0537 | 5.2 | 30 | 0056 | 2.5 |
| SU | 1235 | 1.9 | M | 0628 | 5.1 |
| | 1824 | 5.4 | | 1317 | 2.1 |
| | | | | 1858 | 5.3 |
| | | | 31 | 0141 | 2.1 |
| | | | TU | 0711 | 5.5 |
| | | | | 1358 | 1.8 |
| | | | | 1935 | 5.6 |

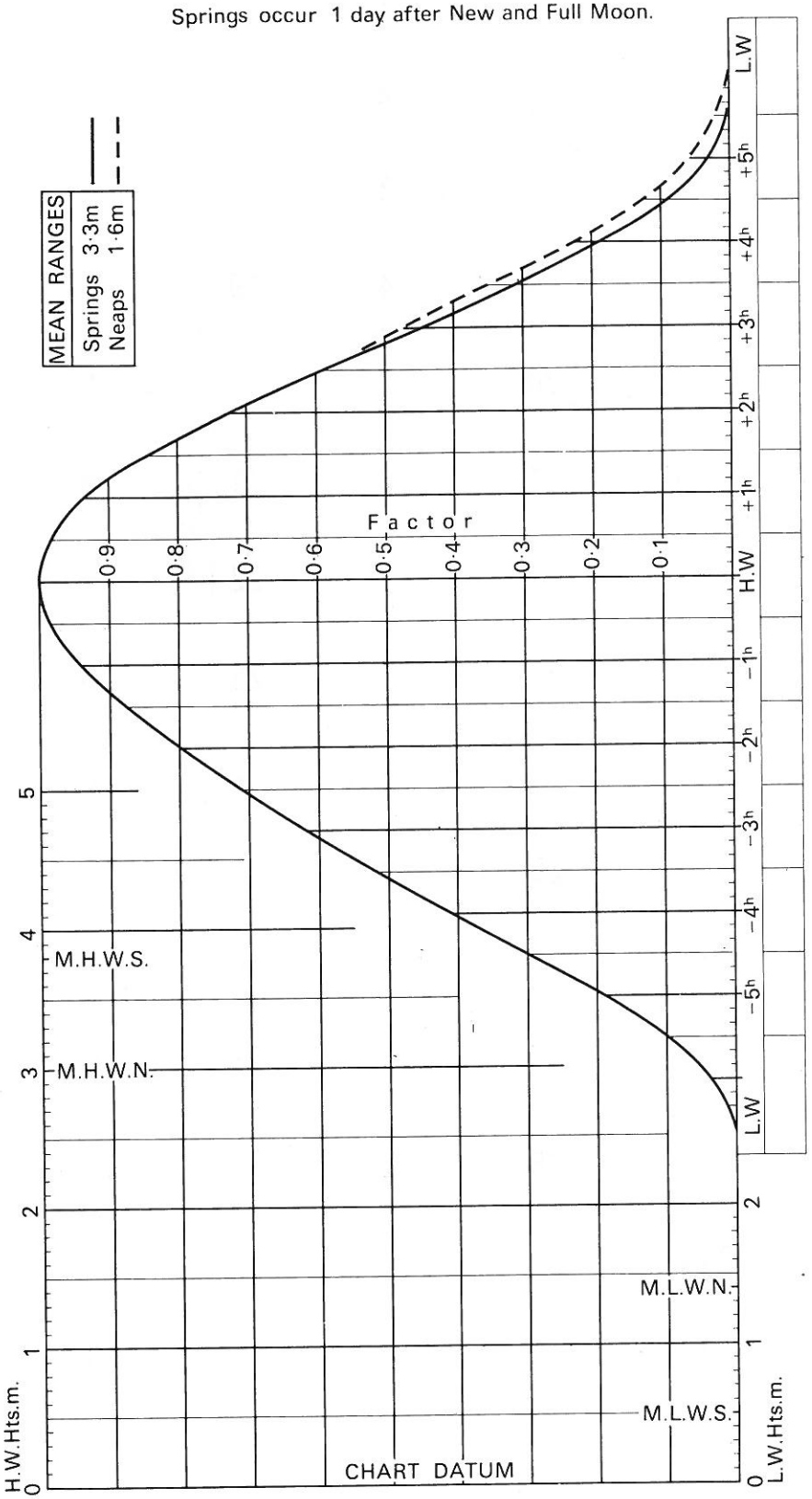
## APRIL

| | Time | m | | Time | m |
|---|---|---|---|---|---|
| 1 | 0219 | 1.8 | 16 | 0229 | 1.1 |
| W | 0750 | 5.8 | TH | 0804 | 6.4 |
| | 1434 | 1.5 | | 1453 | 0.9 |
| | 2010 | 5.9 | | 2030 | 6.4 |
| 2 | 0254 | 1.5 | 17 | 0314 | 0.9 |
| TH | 0826 | 6.0 | F | 0849 | 6.5 |
| | 1507 | 1.2 | | 1535 | 0.8 |
| | 2043 | 6.1 | O | 2110 | 6.5 |
| 3 | 0326 | 1.3 | 18 | 0355 | 0.9 |
| F | 0900 | 6.2 | SA | 0930 | 6.5 |
| | 1540 | 1.1 | | 1613 | 0.9 |
| ● | 2115 | 6.2 | | 2147 | 6.4 |
| 4 | 0359 | 1.1 | 19 | 0433 | 0.9 |
| SA | 0932 | 6.3 | SU | 1007 | 6.3 |
| | 1613 | 1.0 | | 1649 | 1.1 |
| | 2146 | 6.3 | | 2222 | 6.3 |
| 5 | 0432 | 1.1 | 20 | 0509 | 1.1 |
| SU | 1005 | 6.3 | M | 1043 | 6.1 |
| | 1645 | 1.1 | | 1724 | 1.4 |
| | 2218 | 6.2 | | 2255 | 6.1 |
| 6 | 0506 | 1.1 | 21 | 0543 | 1.3 |
| M | 1040 | 6.2 | TU | 1117 | 5.8 |
| | 1719 | 1.2 | | 1758 | 1.8 |
| | 2251 | 6.1 | | 2328 | 5.8 |
| 7 | 0541 | 1.2 | 22 | 0619 | 1.7 |
| TU | 1115 | 6.0 | W | 1153 | 5.4 |
| | 1754 | 1.4 | | 1834 | 2.1 |
| | 2326 | 5.9 | | | |
| 8 | 0619 | 1.5 | 23 | 0004 | 5.4 |
| W | 1154 | 5.7 | TH | 0657 | 2.0 |
| | 1835 | 1.8 | | 1232 | 5.1 |
| | | | | 1915 | 2.5 |
| 9 | 0007 | 5.7 | 24 | 0048 | 5.1 |
| TH | 0705 | 1.8 | F | 0744 | 2.4 |
| | 1242 | 5.3 | | 1325 | 4.8 |
| | 1926 | 2.2 | | 2010 | 2.8 |
| 10 | 0059 | 5.3 | 25 | 0149 | 4.8 |
| F | 0803 | 2.1 | SA | 0847 | 2.6 |
| | 1348 | 5.0 | | 1445 | 4.6 |
| | 2035 | 2.5 | | 2128 | 3.0 |
| 11 | 0213 | 5.0 | 26 | 0316 | 4.6 |
| SA | 0922 | 2.3 | SU | 1008 | 2.7 |
| | 1525 | 4.9 | | 1613 | 4.6 |
| | 2205 | 2.5 | | 2300 | 2.9 |
| 12 | 0353 | 5.0 | 27 | 0435 | 4.7 |
| SU | 1053 | 2.2 | M | 1123 | 2.5 |
| | 1657 | 5.1 | | 1719 | 4.8 |
| | 2333 | 2.3 | | | |
| 13 | 0517 | 5.3 | 28 | 0000 | 2.6 |
| M | 1212 | 1.8 | TU | 0535 | 5.0 |
| | 1803 | 5.5 | | 1221 | 2.2 |
| | | | | 1809 | 5.2 |
| 14 | 0042 | 1.9 | 29 | 0052 | 2.2 |
| TU | 0621 | 5.7 | W | 0625 | 5.3 |
| | 1313 | 1.4 | | 1309 | 1.9 |
| | 1858 | 5.9 | | 1851 | 5.5 |
| 15 | 0139 | 1.4 | 30 | 0136 | 1.9 |
| W | 0715 | 6.1 | TH | 0709 | 5.6 |
| | 1406 | 1.1 | | 1351 | 1.6 |
| | 1946 | 6.2 | | 1931 | 5.8 |

# LISBON

MEAN SPRING AND NEAP CURVES

Springs occur 1 day after New and Full Moon.



# PORTUGAL - LISBON

LAT 38°42'N LONG 9°08'W

TIME ZONE **UT(GMT)** TIMES AND HEIGHTS OF HIGH AND LOW WATERS YEAR **1992**

## JANUARY

| | Time | m | | Time | m |
|---|---|---|---|---|---|
| **1** | 0025 | 3.3 | **16** | 0522 | 1.3 |
| W | 0617 | 1.3 | TH | 1200 | 3.1 |
| | 1253 | 3.2 | | 1748 | 1.1 |
| | 1832 | 1.2 | | | |
| **2** | 0116 | 3.4 | **17** | 0034 | 3.3 |
| TH | 0702 | 1.1 | F | 0625 | 1.0 |
| | 1342 | 3.3 | | 1308 | 3.3 |
| | 1913 | 1.1 | | 1845 | 0.9 |
| **3** | 0200 | 3.5 | **18** | 0133 | 3.6 |
| F | 0743 | 1.0 | SA | 0720 | 0.7 |
| | 1424 | 3.3 | | 1404 | 3.5 |
| | 1949 | 1.1 | | 1937 | 0.7 |
| **4** | 0240 | 3.6 | **19** | 0225 | 3.8 |
| SA | 0819 | 0.9 | SU | 0811 | 0.5 |
| ● | 1503 | 3.4 | | 1454 | 3.7 |
| | 2025 | 1.0 | O | 2026 | 0.5 |
| **5** | 0317 | 3.7 | **20** | 0312 | 4.1 |
| SU | 0854 | 0.9 | M | 0859 | 0.3 |
| | 1540 | 3.4 | | 1540 | 3.9 |
| | 2059 | 0.9 | | 2113 | 0.4 |
| **6** | 0353 | 3.7 | **21** | 0358 | 4.2 |
| M | 0928 | 0.8 | TU | 0945 | 0.3 |
| | 1614 | 3.4 | | 1625 | 3.9 |
| | 2133 | 0.9 | | 2158 | 0.4 |
| **7** | 0426 | 3.7 | **22** | 0443 | 4.2 |
| TU | 1001 | 0.8 | W | 1030 | 0.3 |
| | 1647 | 3.4 | | 1709 | 3.9 |
| | 2207 | 0.9 | | 2242 | 0.5 |
| **8** | 0458 | 3.6 | **23** | 0527 | 4.1 |
| W | 1034 | 0.8 | TH | 1114 | 0.5 |
| | 1718 | 3.4 | | 1752 | 3.8 |
| | 2241 | 0.9 | | 2327 | 0.7 |
| **9** | 0529 | 3.6 | **24** | 0611 | 3.9 |
| TH | 1108 | 0.9 | F | 1159 | 0.7 |
| | 1749 | 3.3 | | 1837 | 3.6 |
| | 2316 | 1.0 | | | |
| **10** | 0559 | 3.5 | **25** | 0013 | 0.9 |
| F | 1143 | 1.0 | SA | 0657 | 3.7 |
| | 1820 | 3.2 | | 1246 | 1.0 |
| | 2354 | 1.1 | | 1924 | 3.4 |
| **11** | 0632 | 3.3 | **26** | 0105 | 1.2 |
| SA | 1222 | 1.1 | SU | 0748 | 3.4 |
| | 1856 | 3.1 | | 1340 | 1.3 |
| | | | | 2018 | 3.2 |
| **12** | 0037 | 1.2 | **27** | 0208 | 1.4 |
| SU | 0710 | 3.2 | M | 0848 | 3.1 |
| | 1310 | 1.2 | | 1448 | 1.5 |
| | 1940 | 3.0 | | 2126 | 3.0 |
| **13** | 0132 | 1.4 | **28** | 0331 | 1.6 |
| M | 0800 | 3.1 | TU | 1005 | 2.9 |
| | 1410 | 1.4 | | 1608 | 1.6 |
| | 2039 | 3.0 | | 2246 | 3.0 |
| **14** | 0245 | 1.5 | **29** | 0456 | 1.5 |
| TU | 0908 | 3.0 | W | 1129 | 2.9 |
| | 1525 | 1.4 | | 1721 | 1.5 |
| | 2156 | 3.0 | | | |
| **15** | 0407 | 1.4 | **30** | 0001 | 3.1 |
| W | 1035 | 3.0 | TH | 0602 | 1.4 |
| | 1642 | 1.3 | | 1237 | 3.0 |
| | 2321 | 3.1 | | 1815 | 1.4 |
| | | | **31** | 0059 | 3.2 |
| | | | F | 0652 | 1.3 |
| | | | | 1328 | 3.1 |
| | | | | 1858 | 1.3 |

## FEBRUARY

| | Time | m | | Time | m |
|---|---|---|---|---|---|
| **1** | 0144 | 3.4 | **16** | 0119 | 3.6 |
| SA | 1409 | 3.2 | SU | 1351 | 3.5 |
| | 1935 | 1.1 | | 1926 | 0.7 |
| **2** | 0223 | 3.5 | **17** | 0210 | 3.9 |
| SU | 0805 | 0.9 | M | 0758 | 0.5 |
| | 1446 | 3.4 | | 1438 | 3.8 |
| | 2010 | 0.9 | | 2013 | 0.5 |
| **3** | 0259 | 3.6 | **18** | 0256 | 4.1 |
| M | 0837 | 0.8 | TU | 0843 | 0.3 |
| ● | 1520 | 3.4 | | 1522 | 3.9 |
| | 2042 | 0.8 | O | 2057 | 0.4 |
| **4** | 0332 | 3.7 | **19** | 0340 | 4.2 |
| TU | 0908 | 0.7 | W | 0926 | 0.2 |
| | 1552 | 3.5 | | 1604 | 4.0 |
| | 2115 | 0.7 | | 2140 | 0.3 |
| **5** | 0404 | 3.7 | **20** | 0422 | 4.3 |
| W | 0938 | 0.7 | TH | 1007 | 0.3 |
| | 1622 | 3.5 | | 1645 | 4.0 |
| | 2146 | 0.7 | | 2221 | 0.4 |
| **6** | 0433 | 3.7 | **21** | 0504 | 4.1 |
| TH | 1009 | 0.7 | F | 1047 | 0.5 |
| | 1650 | 3.5 | | 1725 | 3.9 |
| | 2218 | 0.7 | | 2301 | 0.6 |
| **7** | 0501 | 3.7 | **22** | 0545 | 3.9 |
| F | 1040 | 0.7 | SA | 1126 | 0.7 |
| | 1718 | 3.5 | | 1806 | 3.7 |
| | 2250 | 0.8 | | 2342 | 0.8 |
| **8** | 0529 | 3.6 | **23** | 0627 | 3.6 |
| SA | 1112 | 0.8 | SU | 1206 | 1.0 |
| | 1746 | 3.4 | | 1849 | 3.4 |
| | 2325 | 0.9 | | | |
| **9** | 0558 | 3.5 | **24** | 0026 | 1.1 |
| SU | 1148 | 0.9 | M | 0713 | 3.3 |
| | 1818 | 3.3 | | 1251 | 1.3 |
| | | | | 1937 | 3.2 |
| **10** | 0005 | 1.0 | **25** | 0120 | 1.4 |
| M | 0633 | 3.3 | TU | 0808 | 3.0 |
| | 1230 | 1.1 | | 1348 | 1.6 |
| | 1857 | 3.2 | | 2039 | 3.0 |
| **11** | 0054 | 1.2 | **26** | 0239 | 1.6 |
| TU | 0720 | 3.1 | W | 0923 | 2.8 |
| | 1325 | 1.3 | | 1514 | 1.7 |
| | 1953 | 3.0 | | 2203 | 2.9 |
| **12** | 0202 | 1.4 | **27** | 0424 | 1.6 |
| W | 0829 | 2.9 | TH | 1058 | 2.7 |
| | 1441 | 1.4 | | 1649 | 1.7 |
| | 2115 | 2.9 | | 2331 | 2.9 |
| **13** | 0335 | 1.4 | **28** | 0543 | 1.5 |
| TH | 1008 | 2.8 | F | 1213 | 2.8 |
| | 1613 | 1.4 | | 1754 | 1.5 |
| | 2256 | 3.0 | | | |
| **14** | 0504 | 1.3 | **29** | 0033 | 3.1 |
| F | 1146 | 3.0 | SA | 0632 | 1.3 |
| | 1732 | 1.2 | | 1305 | 3.0 |
| | | | | 1838 | 1.3 |
| **15** | 0018 | 3.3 | | | |
| SA | 0613 | 1.0 | | | |
| | 1257 | 3.3 | | | |
| | 1833 | 1.0 | | | |

## MARCH

| | Time | m | | Time | m |
|---|---|---|---|---|---|
| **1** | 0120 | 3.3 | **16** | 0100 | 3.6 |
| SU | 1345 | 3.2 | M | 1332 | 3.6 |
| | 1915 | 1.1 | | 1910 | 0.7 |
| **2** | 0159 | 3.5 | **17** | 0150 | 3.9 |
| M | 0741 | 0.9 | TU | 0740 | 0.5 |
| | 1421 | 3.4 | | 1417 | 3.8 |
| | 1948 | 0.9 | | 1955 | 0.5 |
| **3** | 0233 | 3.6 | **18** | 0236 | 4.1 |
| TU | 0811 | 0.8 | W | 0822 | 0.3 |
| | 1453 | 3.5 | | 1500 | 4.0 |
| | 2019 | 0.8 | O | 2037 | 0.4 |
| **4** | 0306 | 3.7 | **19** | 0319 | 4.2 |
| W | 0841 | 0.7 | TH | 0902 | 0.3 |
| | 1524 | 3.6 | | 1540 | 4.0 |
| ● | 2051 | 0.7 | | 2118 | 0.4 |
| **5** | 0337 | 3.8 | **20** | 0400 | 4.2 |
| TH | 0911 | 0.6 | F | 0940 | 0.4 |
| | 1554 | 3.6 | | 1620 | 4.0 |
| | 2122 | 0.6 | | 2157 | 0.4 |
| **6** | 0406 | 3.8 | **21** | 0440 | 4.0 |
| F | 0941 | 0.6 | SA | 1017 | 0.6 |
| | 1622 | 3.6 | | 1659 | 3.9 |
| | 2154 | 0.6 | | 2235 | 0.6 |
| **7** | 0435 | 3.7 | **22** | 0520 | 3.8 |
| SA | 1013 | 0.6 | SU | 1053 | 0.8 |
| | 1650 | 3.6 | | 1738 | 3.7 |
| | 2227 | 0.7 | | 2314 | 0.8 |
| **8** | 0504 | 3.6 | **23** | 0600 | 3.5 |
| SU | 1046 | 0.7 | M | 1130 | 1.0 |
| | 1719 | 3.5 | | 1818 | 3.5 |
| | 2302 | 0.8 | | 2354 | 1.1 |
| **9** | 0535 | 3.5 | **24** | 0644 | 3.2 |
| M | 1122 | 0.9 | TU | 1209 | 1.3 |
| | 1753 | 3.4 | | 1903 | 3.2 |
| | 2343 | 0.9 | | | |
| **10** | 0613 | 3.3 | **25** | 0043 | 1.4 |
| TU | 1203 | 1.0 | W | 0735 | 2.9 |
| | 1835 | 3.2 | | 1259 | 1.5 |
| | | | | 1959 | 3.0 |
| **11** | 0032 | 1.1 | **26** | 0151 | 1.6 |
| W | 0704 | 3.1 | TH | 0843 | 2.7 |
| | 1257 | 1.3 | | 1415 | 1.7 |
| | 1933 | 3.1 | | 2116 | 2.8 |
| **12** | 0141 | 1.3 | **27** | 0335 | 1.7 |
| TH | 0817 | 2.9 | F | 1013 | 2.6 |
| | 1415 | 1.5 | | 1601 | 1.7 |
| | 2058 | 3.0 | | 2244 | 2.9 |
| **13** | 0318 | 1.4 | **28** | 0503 | 1.5 |
| F | 0958 | 2.8 | SA | 1134 | 2.8 |
| | 1555 | 1.5 | | 1717 | 1.6 |
| | 2239 | 3.0 | | 2354 | 3.0 |
| **14** | 0452 | 1.2 | **29** | 0555 | 1.4 |
| SA | 1133 | 3.0 | SU | 1229 | 3.0 |
| | 1718 | 1.2 | | 1805 | 1.4 |
| **15** | 0000 | 3.3 | **30** | 0044 | 3.2 |
| SU | 0600 | 1.0 | M | 0633 | 1.2 |
| | 1240 | 3.3 | | 1311 | 3.2 |
| | 1819 | 1.0 | | 1843 | 1.2 |
| | | | **31** | 0125 | 3.4 |
| | | | TU | 0706 | 1.0 |
| | | | | 1347 | 3.4 |
| | | | | 1917 | 1.0 |

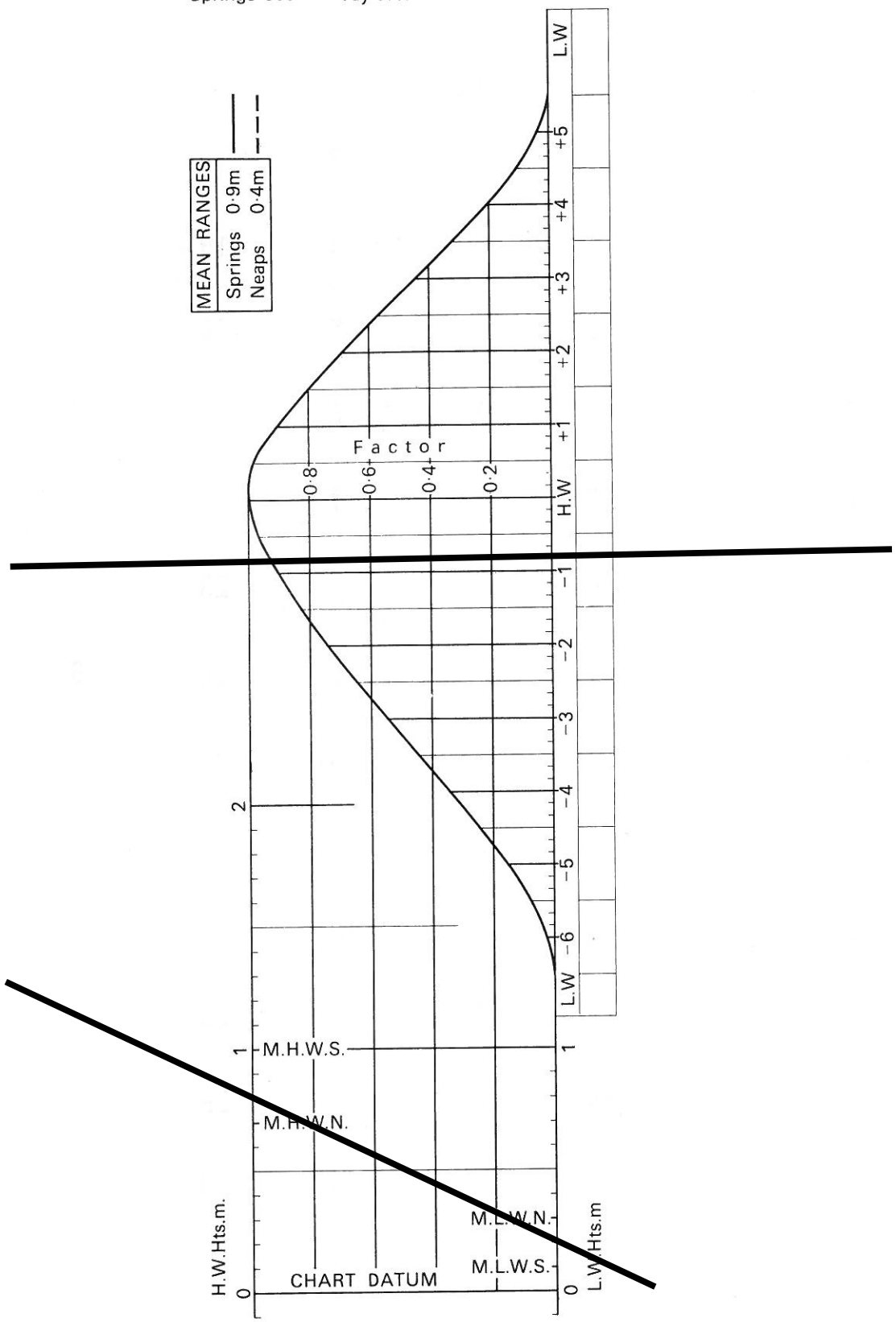
## APRIL

| | Time | m | | Time | m |
|---|---|---|---|---|---|
| **1** | 0201 | 3.5 | **16** | 0213 | 4.0 |
| W | 0738 | 0.8 | TH | 0757 | 0.5 |
| | 1421 | 3.5 | | 1436 | 3.9 |
| | 1950 | 0.8 | | 2015 | 0.5 |
| **2** | 0234 | 3.6 | **17** | 0257 | 4.0 |
| TH | 0809 | 0.7 | F | 0836 | 0.5 |
| | 1453 | 3.6 | | 1517 | 4.0 |
| | 2023 | 0.7 | O | 2055 | 0.5 |
| **3** | 0307 | 3.7 | **18** | 0338 | 3.9 |
| F | 0841 | 0.6 | SA | 0913 | 0.6 |
| ● | 1524 | 3.7 | | 1556 | 3.9 |
| | 2057 | 0.6 | | 2133 | 0.6 |
| **4** | 0339 | 3.7 | **19** | 0418 | 3.8 |
| SA | 0914 | 0.6 | SU | 0949 | 0.7 |
| | 1556 | 3.7 | | 1635 | 3.8 |
| | 2131 | 0.6 | | 2211 | 0.7 |
| **5** | 0412 | 3.7 | **20** | 0458 | 3.6 |
| SU | 0948 | 0.6 | M | 1024 | 0.9 |
| | 1628 | 3.7 | | 1714 | 3.7 |
| | 2207 | 0.6 | | 2249 | 0.9 |
| **6** | 0446 | 3.6 | **21** | 0538 | 3.4 |
| M | 1024 | 0.7 | TU | 1100 | 1.1 |
| | 1702 | 3.6 | | 1753 | 3.5 |
| | 2246 | 0.7 | | 2329 | 1.1 |
| **7** | 0524 | 3.5 | **22** | 0620 | 3.2 |
| TU | 1103 | 0.8 | W | 1139 | 1.3 |
| | 1741 | 3.5 | | 1836 | 3.3 |
| | 2330 | 0.9 | | | |
| **8** | 0609 | 3.3 | **23** | 0015 | 1.3 |
| W | 1148 | 1.0 | TH | 0707 | 2.9 |
| | 1829 | 3.3 | | 1225 | 1.5 |
| | | | | 1926 | 3.1 |
| **9** | 0023 | 1.1 | **24** | 0113 | 1.5 |
| TH | 0705 | 3.1 | F | 0806 | 2.8 |
| | 1245 | 1.3 | | 1327 | 1.6 |
| | 1931 | 3.2 | | 2029 | 2.9 |
| **10** | 0135 | 1.2 | **25** | 0233 | 1.6 |
| F | 0819 | 2.9 | SA | 0918 | 2.7 |
| | 1404 | 1.4 | | 1455 | 1.7 |
| | 2051 | 3.1 | | 2143 | 2.9 |
| **11** | 0308 | 1.3 | **26** | 0359 | 1.5 |
| SA | 0948 | 2.9 | SU | 1034 | 2.8 |
| | 1541 | 1.4 | | 1619 | 1.6 |
| | 2219 | 3.2 | | 2255 | 3.0 |
| **12** | 0436 | 1.2 | **27** | 0500 | 1.4 |
| SU | 1111 | 3.1 | M | 1137 | 2.9 |
| | 1701 | 1.2 | | 1717 | 1.5 |
| | 2335 | 3.4 | | 2353 | 3.1 |
| **13** | 0541 | 1.0 | **28** | 0546 | 1.2 |
| M | 1215 | 3.3 | TU | 1226 | 3.1 |
| | 1800 | 1.0 | | 1802 | 1.3 |
| **14** | 0036 | 3.6 | **29** | 0040 | 3.3 |
| TU | 0632 | 0.7 | W | 0624 | 1.1 |
| | 1308 | 3.6 | | 1307 | 3.3 |
| | 1849 | 0.8 | | 1840 | 1.1 |
| **15** | 0127 | 3.8 | **30** | 0122 | 3.4 |
| W | 0716 | 0.6 | TH | 0700 | 0.9 |
| | 1354 | 3.8 | | 1344 | 3.5 |
| | 1934 | 0.6 | | 1918 | 0.9 |

# GIBRALTAR

MEAN SPRING AND NEAP CURVES

Springs occur 1 day after New and Full Moon.



# GIBRALTAR

**LAT 36°08'N LONG 5°21'W**

TIME ZONE **-0100** TIMES AND HEIGHTS OF HIGH AND LOW WATERS YEAR **1992**

## JANUARY

| | Time | m | | Time | m |
|---|---|---|---|---|---|
| **1** | 0027 | 0.7 | **16** | 0528 | 0.2 |
| W | 0615 | 0.3 | TH | 1156 | 0.8 |
| | 1250 | 0.8 | | 1814 | 0.1 |
| | 1849 | 0.2 | | | |
| **2** | 0120 | 0.8 | **17** | 0047 | 0.8 |
| TH | 0702 | 0.2 | F | 0632 | 0.2 |
| | 1340 | 0.8 | | 1302 | 0.8 |
| | 1932 | 0.2 | | 1910 | 0.1 |
| **3** | 0206 | 0.8 | **18** | 0145 | 0.8 |
| F | 0743 | 0.2 | SA | 0727 | 0.1 |
| | 1423 | 0.8 | | 1400 | 0.9 |
| | 2011 | 0.1 | | 1959 | 0.0 |
| **4** | 0246 | 0.8 | **19** | 0236 | 0.9 |
| SA | 0822 | 0.2 | SU | 0817 | 0.0 |
| ● | 1502 | 0.8 | | 1452 | 0.9 |
| | 2049 | 0.1 | ○ | 2045 | 0.0 |
| **5** | 0324 | 0.9 | **20** | 0324 | 1.0 |
| SU | 0859 | 0.2 | M | 0903 | 0.0 |
| | 1537 | 0.8 | | 1541 | 1.0 |
| | 2125 | 0.1 | | 2128 | -0.1 |
| **6** | 0359 | 0.9 | **21** | 0410 | 1.0 |
| M | 0934 | 0.2 | TU | 0948 | 0.0 |
| | 1611 | 0.8 | | 1627 | 1.0 |
| | 2159 | 0.1 | | 2211 | -0.1 |
| **7** | 0433 | 0.9 | **22** | 0455 | 1.0 |
| TU | 1009 | 0.1 | W | 1033 | 0.0 |
| | 1645 | 0.8 | | 1713 | 1.0 |
| | 2233 | 0.1 | | 2253 | 0.0 |
| **8** | 0507 | 0.9 | **23** | 0540 | 1.0 |
| W | 1044 | 0.1 | TH | 1117 | 0.0 |
| | 1718 | 0.8 | | 1759 | 0.9 |
| | 2306 | 0.1 | | 2335 | 0.0 |
| **9** | 0540 | 0.8 | **24** | 0625 | 0.9 |
| TH | 1118 | 0.2 | F | 1202 | 0.0 |
| | 1753 | 0.8 | | 1846 | 0.8 |
| | 2340 | 0.1 | | | |
| **10** | 0615 | 0.8 | **25** | 0018 | 0.1 |
| F | 1154 | 0.2 | SA | 0711 | 0.9 |
| | 1831 | 0.8 | | 1249 | 0.1 |
| | | | | 1934 | 0.8 |
| **11** | 0015 | 0.2 | **26** | 0104 | 0.1 |
| SA | 0653 | 0.8 | SU | 0801 | 0.8 |
| | 1235 | 0.2 | | 1342 | 0.2 |
| | 1914 | 0.7 | | 2027 | 0.7 |
| **12** | 0056 | 0.2 | **27** | 0157 | 0.2 |
| SU | 0736 | 0.8 | M | 0856 | 0.7 |
| | 1322 | 0.2 | | 1449 | 0.2 |
| | 2006 | 0.7 | | 2130 | 0.6 |
| **13** | 0146 | 0.2 | **28** | 0308 | 0.3 |
| M | 0827 | 0.7 | TU | 1002 | 0.7 |
| | 1421 | 0.2 | | 1620 | 0.2 |
| | 2109 | 0.7 | | 2243 | 0.6 |
| **14** | 0250 | 0.3 | **29** | 0442 | 0.3 |
| TU | 0930 | 0.7 | W | 1118 | 0.6 |
| | 1539 | 0.2 | | 1739 | 0.2 |
| | 2224 | 0.7 | | 2358 | 0.6 |
| **15** | 0410 | 0.3 | **30** | 0557 | 0.2 |
| W | 1043 | 0.7 | TH | 1228 | 0.6 |
| | 1704 | 0.2 | | 1836 | 0.2 |
| | 2341 | 0.7 | | | |
| | | | **31** | 0059 | 0.7 |
| | | | F | 0650 | 0.2 |
| | | | | 1324 | 0.7 |
| | | | | 1920 | 0.1 |

## FEBRUARY

| | Time | m | | Time | m |
|---|---|---|---|---|---|
| **1** | 0148 | 0.7 | **16** | 0131 | 0.8 |
| SA | 0732 | 0.2 | SU | 0718 | 0.0 |
| | 1409 | 0.7 | | 1350 | 0.8 |
| | 1959 | 0.1 | | 1948 | 0.0 |
| **2** | 0229 | 0.7 | **17** | 0222 | 0.9 |
| SU | 0810 | 0.1 | M | 0806 | 0.0 |
| | 1446 | 0.7 | | 1441 | 0.9 |
| | 2034 | 0.0 | | 2031 | -0.1 |
| **3** | 0304 | 0.8 | **18** | 0308 | 0.9 |
| M | 0845 | 0.1 | TU | 0850 | -0.1 |
| | 1520 | 0.8 | | 1527 | 0.9 |
| ● | 2108 | 0.0 | ○ | 2111 | -0.1 |
| **4** | 0338 | 0.8 | **19** | 0352 | 1.0 |
| TU | 0917 | 0.0 | W | 0932 | -0.1 |
| | 1552 | 0.8 | | 1611 | 0.9 |
| | 2139 | 0.0 | | 2151 | -0.1 |
| **5** | 0409 | 0.8 | **20** | 0435 | 1.0 |
| W | 0949 | 0.0 | TH | 1012 | -0.1 |
| | 1624 | 0.8 | | 1654 | 0.9 |
| | 2210 | 0.0 | | 2229 | -0.1 |
| **6** | 0441 | 0.8 | **21** | 0516 | 0.9 |
| TH | 1020 | 0.0 | F | 1053 | -0.1 |
| | 1655 | 0.8 | | 1736 | 0.9 |
| | 2240 | 0.0 | | 2307 | 0.0 |
| **7** | 0512 | 0.8 | **22** | 0558 | 0.9 |
| F | 1052 | 0.0 | SA | 1133 | 0.0 |
| | 1728 | 0.8 | | 1819 | 0.8 |
| | 2310 | 0.0 | | 2346 | 0.0 |
| **8** | 0545 | 0.8 | **23** | 0640 | 0.8 |
| SA | 1124 | 0.0 | SU | 1214 | 0.0 |
| | 1804 | 0.8 | | 1903 | 0.7 |
| | 2342 | 0.1 | | | |
| **9** | 0620 | 0.8 | **24** | 0026 | 0.1 |
| SU | 1200 | 0.1 | M | 0723 | 0.7 |
| | 1844 | 0.7 | | 1300 | 0.1 |
| | | | | 1951 | 0.7 |
| **10** | 0019 | 0.1 | **25** | 0112 | 0.2 |
| M | 0700 | 0.7 | TU | 0813 | 0.6 |
| | 1242 | 0.1 | | 1357 | 0.2 |
| | 1931 | 0.7 | | 2048 | 0.6 |
| **11** | 0104 | 0.1 | **26** | 0214 | 0.2 |
| TU | 0749 | 0.7 | W | 0916 | 0.6 |
| | 1335 | 0.2 | | 1532 | 0.2 |
| | 2032 | 0.6 | | 2202 | 0.6 |
| **12** | 0204 | 0.2 | **27** | 0405 | 0.3 |
| W | 0852 | 0.7 | TH | 1040 | 0.5 |
| | 1453 | 0.2 | | 1713 | 0.2 |
| | 2151 | 0.6 | | 2324 | 0.6 |
| **13** | 0334 | 0.2 | **28** | 0538 | 0.2 |
| TH | 1014 | 0.6 | F | 1204 | 0.6 |
| | 1643 | 0.2 | | 1814 | 0.2 |
| | 2318 | 0.6 | | | |
| **14** | 0513 | 0.2 | **29** | 0032 | 0.6 |
| F | 1140 | 0.7 | SA | 0632 | 0.2 |
| | 1804 | 0.1 | | 1304 | 0.6 |
| | | | | 1858 | 0.1 |
| **15** | 0031 | 0.7 | | | |
| SA | 0623 | 0.1 | | | |
| | 1252 | 0.7 | | | |
| | 1900 | 0.0 | | | |

## MARCH

| | Time | m | | Time | m |
|---|---|---|---|---|---|
| **1** | 0123 | 0.7 | **16** | 0112 | 0.8 |
| SU | 0714 | 0.1 | M | 0703 | 0.0 |
| | 1348 | 0.7 | | 1336 | 0.8 |
| | 1936 | 0.1 | | 1928 | 0.0 |
| **2** | 0203 | 0.7 | **17** | 0202 | 0.9 |
| M | 0749 | 0.1 | TU | 0748 | -0.1 |
| | 1424 | 0.7 | | 1425 | 0.9 |
| | 2010 | 0.0 | | 2009 | -0.1 |
| **3** | 0237 | 0.8 | **18** | 0247 | 0.9 |
| TU | 0822 | 0.0 | W | 0830 | -0.1 |
| | 1457 | 0.8 | | 1510 | 0.9 |
| | 2041 | 0.0 | ○ | 2048 | -0.1 |
| **4** | 0309 | 0.8 | **19** | 0330 | 1.0 |
| W | 0853 | 0.0 | TH | 0910 | -0.1 |
| | 1528 | 0.8 | | 1552 | 0.9 |
| ● | 2111 | 0.0 | | 2126 | -0.1 |
| **5** | 0340 | 0.8 | **20** | 0411 | 1.0 |
| TH | 0923 | 0.0 | F | 0948 | -0.1 |
| | 1559 | 0.8 | | 1633 | 0.9 |
| | 2140 | 0.0 | | 2203 | -0.1 |
| **6** | 0411 | 0.8 | **21** | 0451 | 0.9 |
| F | 0953 | 0.0 | SA | 1026 | -0.1 |
| | 1631 | 0.8 | | 1713 | 0.9 |
| | 2210 | 0.0 | | 2239 | 0.0 |
| **7** | 0442 | 0.8 | **22** | 0530 | 0.9 |
| SA | 1024 | 0.0 | SU | 1104 | 0.0 |
| | 1704 | 0.8 | | 1753 | 0.8 |
| | 2240 | 0.0 | | 2316 | 0.1 |
| **8** | 0516 | 0.8 | **23** | 0609 | 0.8 |
| SU | 1057 | 0.0 | M | 1143 | 0.1 |
| | 1741 | 0.8 | | 1835 | 0.7 |
| | 2313 | 0.0 | | 2354 | 0.1 |
| **9** | 0552 | 0.8 | **24** | 0649 | 0.7 |
| M | 1132 | 0.0 | TU | 1225 | 0.1 |
| | 1822 | 0.7 | | 1920 | 0.7 |
| | 2351 | 0.1 | | | |
| **10** | 0634 | 0.7 | **25** | 0038 | 0.2 |
| TU | 1214 | 0.1 | W | 0734 | 0.6 |
| | 1911 | 0.7 | | 1316 | 0.2 |
| | | | | 2013 | 0.6 |
| **11** | 0037 | 0.1 | **26** | 0136 | 0.3 |
| W | 0724 | 0.7 | TH | 0833 | 0.6 |
| | 1306 | 0.1 | | 1441 | 0.3 |
| | 2012 | 0.6 | | 2121 | 0.6 |
| **12** | 0139 | 0.2 | **27** | 0321 | 0.3 |
| TH | 0830 | 0.6 | F | 0955 | 0.5 |
| | 1427 | 0.2 | | 1630 | 0.3 |
| | 2132 | 0.6 | | 2240 | 0.6 |
| **13** | 0320 | 0.2 | **28** | 0504 | 0.3 |
| F | 0957 | 0.6 | SA | 1125 | 0.5 |
| | 1631 | 0.2 | | 1736 | 0.2 |
| | 2259 | 0.6 | | 2351 | 0.6 |
| **14** | 0505 | 0.2 | **29** | 0601 | 0.2 |
| SA | 1127 | 0.7 | SU | 1230 | 0.6 |
| | 1749 | 0.1 | | 1824 | 0.2 |
| **15** | 0013 | 0.7 | **30** | 0044 | 0.7 |
| SU | 0611 | 0.1 | M | 0643 | 0.2 |
| | 1239 | 0.7 | | 1316 | 0.6 |
| | 1843 | 0.0 | | 1902 | 0.1 |
| | | | **31** | 0125 | 0.7 |
| | | | TU | 0719 | 0.1 |
| | | | | 1353 | 0.7 |
| | | | | 1936 | 0.1 |

## APRIL

| | Time | m | | Time | m |
|---|---|---|---|---|---|
| **1** | 0201 | 0.8 | **16** | 0224 | 0.9 |
| W | 0751 | 0.0 | TH | 0808 | 0.0 |
| | 1426 | 0.8 | | 1449 | 0.9 |
| | 2008 | 0.0 | | 2023 | 0.0 |
| **2** | 0234 | 0.8 | **17** | 0306 | 0.9 |
| TH | 0823 | 0.0 | F | 0847 | -0.1 |
| | 1459 | 0.8 | | 1531 | 0.9 |
| | 2038 | 0.0 | ○ | 2100 | 0.0 |
| **3** | 0307 | 0.8 | **18** | 0347 | 0.9 |
| F | 0854 | 0.0 | SA | 0925 | 0.0 |
| | 1532 | 0.8 | | 1611 | 0.9 |
| ● | 2109 | 0.0 | | 2137 | 0.0 |
| **4** | 0340 | 0.9 | **19** | 0425 | 0.9 |
| SA | 0926 | 0.0 | SU | 1002 | 0.0 |
| | 1607 | 0.8 | | 1650 | 0.9 |
| | 2141 | 0.0 | | 2213 | 0.1 |
| **5** | 0415 | 0.9 | **20** | 0503 | 0.9 |
| SU | 0959 | 0.0 | M | 1040 | 0.0 |
| | 1644 | 0.8 | | 1729 | 0.8 |
| | 2214 | 0.0 | | 2251 | 0.1 |
| **6** | 0452 | 0.9 | **21** | 0541 | 0.8 |
| M | 1034 | 0.0 | TU | 1118 | 0.1 |
| | 1724 | 0.8 | | 1810 | 0.8 |
| | 2251 | 0.1 | | 2330 | 0.2 |
| **7** | 0532 | 0.8 | **22** | 0620 | 0.7 |
| TU | 1113 | 0.0 | W | 1159 | 0.2 |
| | 1808 | 0.8 | | 1853 | 0.7 |
| | 2333 | 0.1 | | | |
| **8** | 0617 | 0.8 | **23** | 0013 | 0.2 |
| W | 1157 | 0.1 | TH | 0702 | 0.7 |
| | 1900 | 0.7 | | 1248 | 0.2 |
| | | | | 1941 | 0.7 |
| **9** | 0023 | 0.2 | **24** | 0108 | 0.3 |
| TH | 0711 | 0.7 | F | 0754 | 0.6 |
| | 1254 | 0.2 | | 1355 | 0.3 |
| | 2002 | 0.7 | | 2039 | 0.6 |
| **10** | 0132 | 0.2 | **25** | 0230 | 0.3 |
| F | 0820 | 0.7 | SA | 0903 | 0.6 |
| | 1419 | 0.2 | | 1526 | 0.3 |
| | 2117 | 0.7 | | 2146 | 0.6 |
| **11** | 0315 | 0.2 | **26** | 0405 | 0.3 |
| SA | 0944 | 0.7 | SU | 1024 | 0.6 |
| | 1610 | 0.2 | | 1640 | 0.3 |
| | 2237 | 0.7 | | 2253 | 0.6 |
| **12** | 0448 | 0.2 | **27** | 0512 | 0.3 |
| SU | 1109 | 0.7 | M | 1135 | 0.6 |
| | 1723 | 0.2 | | 1734 | 0.2 |
| | 2349 | 0.8 | | 2350 | 0.7 |
| **13** | 0552 | 0.1 | **28** | 0600 | 0.2 |
| M | 1219 | 0.7 | TU | 1229 | 0.7 |
| | 1818 | 0.1 | | 1818 | 0.2 |
| **14** | 0048 | 0.8 | **29** | 0037 | 0.7 |
| TU | 0642 | 0.0 | W | 0640 | 0.1 |
| | 1316 | 0.8 | | 1313 | 0.7 |
| | 1903 | 0.0 | | 1855 | 0.2 |
| **15** | 0139 | 0.9 | **30** | 0119 | 0.8 |
| W | 0727 | 0.0 | TH | 0716 | 0.1 |
| | 1405 | 0.9 | | 1352 | 0.8 |
| | 1944 | 0.0 | | 1930 | 0.1 |

# ITALY - VENEZIA (VENICE)

LAT 45°26'N LONG 12°20'E

TIME ZONE -0100

TIMES AND HEIGHTS OF HIGH AND LOW WATERS

YEAR 1992

## JANUARY

| | Time | m | | Time | m |
|---|---|---|---|---|---|
| 1 | 0136 | 0.5 | 16 | 0120 | 0.5 |
| W | 0749 | 0.9 | TH | 0731 | 0.9 |
| | 1515 | 0.0 | | 1457 | 0.0 |
| | 2219 | 0.7 | | 2155 | 0.7 |
| 2 | 0240 | 0.5 | 17 | 0234 | 0.5 |
| TH | 0831 | 0.9 | F | 0825 | 0.9 |
| | 1548 | 0.0 | | 1534 | -0.1 |
| | 2250 | 0.8 | | 2226 | 0.8 |
| 3 | 0328 | 0.5 | 18 | 0328 | 0.4 |
| F | 0907 | 0.9 | SA | 0912 | 1.0 |
| | 1617 | -0.1 | | 1609 | -0.1 |
| | 2318 | 0.8 | | 2256 | 0.9 |
| 4 | 0408 | 0.5 | 19 | 0413 | 0.4 |
| SA | 0940 | 0.9 | SU | 0953 | 1.0 |
| ● | 1645 | -0.1 | ○ | 1642 | -0.1 |
| | 2343 | 0.8 | | 2326 | 0.9 |
| 5 | 0443 | 0.5 | 20 | 0455 | 0.3 |
| SU | 1010 | 0.9 | M | 1032 | 1.0 |
| | 1711 | -0.1 | | 1715 | -0.1 |
| | | | | 2356 | 1.0 |
| 6 | 0006 | 0.8 | 21 | 0535 | 0.3 |
| M | 0516 | 0.4 | TU | 1110 | 0.9 |
| | 1040 | 0.9 | | 1746 | -0.1 |
| | 1736 | -0.1 | | | |
| 7 | 0029 | 0.9 | 22 | 0027 | 1.0 |
| TU | 0550 | 0.4 | W | 0614 | 0.3 |
| | 1110 | 0.9 | | 1146 | 0.9 |
| | 1801 | 0.0 | | 1817 | 0.0 |
| 8 | 0051 | 0.9 | 23 | 0058 | 1.0 |
| W | 0625 | 0.4 | TH | 0656 | 0.3 |
| | 1140 | 0.8 | | 1222 | 0.8 |
| | 1826 | 0.0 | | 1847 | 0.0 |
| 9 | 0116 | 0.9 | 24 | 0130 | 0.9 |
| TH | 0705 | 0.4 | F | 0741 | 0.3 |
| | 1213 | 0.8 | | 1259 | 0.7 |
| | 1851 | 0.1 | | 1915 | 0.1 |
| 10 | 0143 | 0.9 | 25 | 0203 | 0.9 |
| F | 0751 | 0.4 | SA | 0836 | 0.3 |
| | 1248 | 0.7 | | 1340 | 0.6 |
| | 1917 | 0.1 | | 1940 | 0.2 |
| 11 | 0216 | 0.9 | 26 | 0240 | 0.9 |
| SA | 0851 | 0.4 | SU | 0952 | 0.4 |
| | 1331 | 0.6 | | 1440 | 0.5 |
| | 1944 | 0.2 | | 1956 | 0.4 |
| 12 | 0257 | 0.9 | 27 | 0327 | 0.8 |
| SU | 1013 | 0.4 | M | 1153 | 0.3 |
| | 1437 | 0.5 | | | |
| | 2013 | 0.3 | | | |
| 13 | 0351 | 0.9 | 28 | 0441 | 0.8 |
| M | 1159 | 0.3 | TU | 1340 | 0.2 |
| | 1757 | 0.4 | | | |
| | 2053 | 0.4 | | | |
| 14 | 0503 | 0.8 | 29 | 0625 | 0.8 |
| TU | 1322 | 0.2 | W | 1430 | 0.2 |
| | 2050 | 0.5 | | 2203 | 0.7 |
| | 2320 | 0.5 | | | |
| 15 | 0624 | 0.9 | 30 | 0156 | 0.6 |
| W | 1415 | 0.1 | TH | 0738 | 0.8 |
| | 2125 | 0.6 | | 1505 | 0.1 |
| | | | | 2217 | 0.7 |
| | | | 31 | 0257 | 0.5 |
| | | | F | 0827 | 0.8 |
| | | | | 1533 | 0.0 |
| | | | | 2235 | 0.8 |

## FEBRUARY

| | Time | m | | Time | m |
|---|---|---|---|---|---|
| 1 | 0335 | 0.5 | 16 | 0329 | 0.4 |
| SA | 0904 | 0.9 | SU | 0911 | 0.9 |
| | 1559 | 0.0 | | 1548 | -0.1 |
| | 2253 | 0.8 | | 2227 | 0.9 |
| 2 | 0406 | 0.4 | 17 | 0407 | 0.3 |
| SU | 0937 | 0.9 | M | 0951 | 0.9 |
| | 1623 | 0.0 | | 1620 | -0.1 |
| | 2310 | 0.9 | | 2254 | 1.0 |
| 3 | 0434 | 0.4 | 18 | 0443 | 0.2 |
| M | 1007 | 0.9 | TU | 1028 | 1.0 |
| ● | 1647 | 0.0 | ○ | 1651 | -0.1 |
| | 2328 | 0.9 | | 2321 | 1.0 |
| 4 | 0502 | 0.3 | 19 | 0518 | 0.2 |
| TU | 1035 | 0.9 | W | 1103 | 0.9 |
| | 1709 | 0.0 | | 1720 | 0.0 |
| | 2345 | 0.9 | | 2348 | 1.0 |
| 5 | 0531 | 0.3 | 20 | 0552 | 0.2 |
| W | 1104 | 0.9 | TH | 1137 | 0.9 |
| | 1732 | 0.0 | | 1748 | 0.0 |
| 6 | 0005 | 0.9 | 21 | 0014 | 1.0 |
| TH | 0601 | 0.3 | F | 0628 | 0.2 |
| | 1133 | 0.8 | | 1211 | 0.8 |
| | 1755 | 0.0 | | 1814 | 0.1 |
| 7 | 0027 | 1.0 | 22 | 0040 | 1.0 |
| F | 0635 | 0.3 | SA | 0706 | 0.2 |
| | 1204 | 0.8 | | 1244 | 0.7 |
| | 1818 | 0.1 | | 1837 | 0.2 |
| 8 | 0052 | 0.9 | 23 | 0106 | 0.9 |
| SA | 0714 | 0.3 | SU | 0749 | 0.3 |
| | 1238 | 0.7 | | 1321 | 0.6 |
| | 1841 | 0.2 | | 1853 | 0.3 |
| 9 | 0120 | 0.9 | 24 | 0130 | 0.9 |
| SU | 0801 | 0.3 | M | 0847 | 0.3 |
| | 1317 | 0.6 | | 1412 | 0.5 |
| | 1904 | 0.3 | | 1845 | 0.4 |
| 10 | 0155 | 0.9 | 25 | 0156 | 0.8 |
| M | 0907 | 0.3 | TU | 1033 | 0.3 |
| | 1414 | 0.5 | | | |
| | 1923 | 0.4 | | | |
| 11 | 0240 | 0.8 | 26 | 0227 | 0.7 |
| TU | 1052 | 0.3 | W | 1307 | 0.3 |
| | | | | 2216 | 0.6 |
| 12 | 0357 | 0.8 | 27 | 0125 | 0.6 |
| W | 1248 | 0.2 | TH | 0554 | 0.7 |
| | 2105 | 0.6 | | 1405 | 0.2 |
| | 2328 | 0.6 | | 2139 | 0.7 |
| 13 | 0602 | 0.8 | 28 | 0239 | 0.6 |
| TH | 1354 | 0.1 | F | 0735 | 0.7 |
| | 2112 | 0.7 | | 1438 | 0.1 |
| | | | | 2145 | 0.8 |
| 14 | 0143 | 0.5 | 29 | 0305 | 0.5 |
| F | 0729 | 0.8 | SA | 0823 | 0.8 |
| | 1438 | 0.0 | | 1504 | 0.1 |
| | 2135 | 0.8 | | 2157 | 0.8 |
| 15 | 0245 | 0.4 | | | |
| SA | 0826 | 0.9 | | | |
| | 1515 | 0.0 | | | |
| | 2201 | 0.9 | | | |

## MARCH

| | Time | m | | Time | m |
|---|---|---|---|---|---|
| 1 | 0327 | 0.4 | 16 | 0317 | 0.2 |
| SU | 0858 | 0.8 | M | 0905 | 0.9 |
| | 1528 | 0.1 | | 1520 | 0.0 |
| | 2211 | 0.9 | | 2150 | 1.0 |
| 2 | 0350 | 0.3 | 17 | 0351 | 0.2 |
| M | 0929 | 0.8 | TU | 0944 | 0.9 |
| | 1551 | 0.0 | | 1552 | 0.0 |
| | 2226 | 0.9 | | 2217 | 1.0 |
| 3 | 0414 | 0.3 | 18 | 0424 | 0.1 |
| TU | 0957 | 0.9 | W | 1020 | 0.9 |
| | 1614 | 0.0 | ○ | 1622 | 0.0 |
| | 2242 | 1.0 | | 2242 | 1.0 |
| 4 | 0440 | 0.2 | 19 | 0457 | 0.1 |
| W | 1025 | 0.9 | TH | 1055 | 0.9 |
| ● | 1637 | 0.0 | | 1651 | 0.1 |
| | 2259 | 1.0 | | 2307 | 1.0 |
| 5 | 0507 | 0.2 | 20 | 0529 | 0.1 |
| TH | 1054 | 0.9 | F | 1128 | 0.8 |
| | 1700 | 0.1 | | 1719 | 0.1 |
| | 2319 | 1.0 | | 2331 | 1.0 |
| 6 | 0536 | 0.1 | 21 | 0602 | 0.1 |
| F | 1123 | 0.8 | SA | 1203 | 0.8 |
| | 1724 | 0.1 | | 1744 | 0.2 |
| | 2342 | 1.0 | | 2354 | 1.0 |
| 7 | 0608 | 0.1 | 22 | 0637 | 0.1 |
| SA | 1155 | 0.8 | SU | 1238 | 0.7 |
| | 1748 | 0.2 | | 1805 | 0.3 |
| 8 | 0007 | 1.0 | 23 | 0014 | 0.9 |
| SU | 0644 | 0.1 | M | 0714 | 0.2 |
| | 1231 | 0.7 | | 1320 | 0.6 |
| | 1812 | 0.2 | | 1819 | 0.4 |
| 9 | 0035 | 1.0 | 24 | 0033 | 0.8 |
| M | 0727 | 0.2 | TU | 0800 | 0.2 |
| | 1314 | 0.6 | | 1429 | 0.5 |
| | 1837 | 0.3 | | 1804 | 0.5 |
| 10 | 0107 | 0.9 | 25 | 0046 | 0.8 |
| TU | 0824 | 0.2 | W | 0913 | 0.3 |
| | 1421 | 0.6 | | | |
| | 1901 | 0.4 | | | |
| 11 | 0148 | 0.8 | 26 | 0037 | 0.7 |
| W | 0956 | 0.3 | TH | 1130 | 0.3 |
| | | | | 2055 | 0.7 |
| 12 | 0304 | 0.7 | 27 | 1302 | 0.3 |
| TH | 1157 | 0.2 | F | 2044 | 0.7 |
| | 2006 | 0.7 | | | |
| 13 | 0028 | 0.6 | 28 | 0243 | 0.5 |
| F | 0553 | 0.7 | SA | 0720 | 0.6 |
| | 1316 | 0.2 | | 1346 | 0.2 |
| | 2030 | 0.8 | | 2053 | 0.8 |
| 14 | 0155 | 0.5 | 29 | 0249 | 0.4 |
| SA | 0726 | 0.7 | SU | 0809 | 0.7 |
| | 1405 | 0.1 | | 1418 | 0.2 |
| | 2057 | 0.9 | | 2105 | 0.9 |
| 15 | 0241 | 0.4 | 30 | 0306 | 0.3 |
| SU | 0822 | 0.8 | M | 0844 | 0.7 |
| | 1445 | 0.0 | | 1445 | 0.2 |
| | 2124 | 0.9 | | 2120 | 0.9 |
| | | | 31 | 0326 | 0.2 |
| | | | TU | 0915 | 0.8 |
| | | | | 1511 | 0.1 |
| | | | | 2136 | 0.9 |

## APRIL

| | Time | m | | Time | m |
|---|---|---|---|---|---|
| 1 | 0350 | 0.2 | 16 | 0406 | 0.0 |
| W | 0945 | 0.8 | TH | 1014 | 0.8 |
| | 1536 | 0.1 | | 1553 | 0.2 |
| | 2154 | 1.0 | | 2204 | 1.0 |
| 2 | 0416 | 0.1 | 17 | 0438 | 0.0 |
| TH | 1014 | 0.8 | F | 1051 | 0.8 |
| | 1602 | 0.2 | | 1624 | 0.2 |
| | 2215 | 1.0 | ○ | 2229 | 1.0 |
| 3 | 0444 | 0.0 | 18 | 0510 | 0.0 |
| F | 1045 | 0.8 | SA | 1128 | 0.8 |
| | 1628 | 0.2 | | 1653 | 0.3 |
| ● | 2238 | 1.0 | | 2253 | 1.0 |
| 4 | 0514 | 0.0 | 19 | 0543 | 0.0 |
| SA | 1118 | 0.8 | SU | 1206 | 0.8 |
| | 1656 | 0.2 | | 1721 | 0.4 |
| | 2303 | 1.0 | | 2315 | 0.9 |
| 5 | 0547 | 0.0 | 20 | 0616 | 0.0 |
| SU | 1154 | 0.8 | M | 1247 | 0.7 |
| | 1725 | 0.3 | | 1747 | 0.4 |
| | 2330 | 1.0 | | 2335 | 0.9 |
| 6 | 0624 | 0.0 | 21 | 0651 | 0.1 |
| M | 1235 | 0.7 | TU | 1337 | 0.7 |
| | 1756 | 0.3 | | 1812 | 0.5 |
| | | | | 2353 | 0.8 |
| 7 | 0000 | 0.9 | 22 | 0731 | 0.2 |
| TU | 0705 | 0.1 | W | 1458 | 0.6 |
| | 1328 | 0.7 | | 1838 | 0.6 |
| | 1832 | 0.4 | | | |
| 8 | 0035 | 0.9 | 23 | 0006 | 0.7 |
| W | 0759 | 0.2 | TH | 0820 | 0.2 |
| | 1450 | 0.6 | | 1821 | 0.6 |
| | 1926 | 0.5 | | 2015 | 0.6 |
| | | | | 2359 | 0.7 |
| 9 | 0117 | 0.8 | 24 | 0936 | 0.3 |
| TH | 0914 | 0.2 | F | 1905 | 0.7 |
| | 1725 | 0.6 | | | |
| | 2152 | 0.6 | | | |
| 10 | 0237 | 0.7 | 25 | 1112 | 0.3 |
| F | 1054 | 0.2 | SA | 1926 | 0.8 |
| | 1853 | 0.7 | | | |
| 11 | 0038 | 0.5 | 26 | 0215 | 0.5 |
| SA | 0534 | 0.6 | SU | 0633 | 0.5 |
| | 1220 | 0.2 | | 1224 | 0.3 |
| | 1936 | 0.8 | | 1945 | 0.8 |
| 12 | 0143 | 0.4 | 27 | 0218 | 0.4 |
| SU | 0711 | 0.7 | M | 0742 | 0.6 |
| | 1320 | 0.2 | | 1312 | 0.3 |
| | 2010 | 0.9 | | 2004 | 0.9 |
| 13 | 0224 | 0.3 | 28 | 0237 | 0.3 |
| M | 0810 | 0.7 | TU | 0825 | 0.6 |
| | 1405 | 0.1 | | 1351 | 0.3 |
| | 2041 | 1.0 | | 2024 | 0.9 |
| 14 | 0259 | 0.2 | 29 | 0300 | 0.2 |
| TU | 0856 | 0.8 | W | 0901 | 0.7 |
| | 1445 | 0.1 | | 1425 | 0.3 |
| | 2110 | 1.0 | | 2046 | 1.0 |
| 15 | 0333 | 0.1 | 30 | 0327 | 0.1 |
| W | 0936 | 0.8 | TH | 0935 | 0.7 |
| | 1520 | 0.1 | | 1458 | 0.3 |
| | 2138 | 1.0 | | 2110 | 1.0 |

FOR INTERMEDIATE HEIGHTS USE HARMONIC CONSTANTS (SEE PART III)

# ITALY - VENEZIA (VENICE)

**LAT 45°26'N** **LONG 12°20'E**

TIME ZONE **-0100** TIMES AND HEIGHTS OF HIGH AND LOW WATERS YEAR **1992**

## MAY

| | Time | m | | Time | m |
|---|---|---|---|---|---|
| **1** | 0355 | 0.0 | **16** | 0425 | -0.1 |
| | 1009 | 0.8 | | 1057 | 0.8 |
| F | 1530 | 0.3 | SA | 1604 | 0.4 |
| | 2137 | 1.0 | ○ | 2159 | 1.0 |
| **2** | 0426 | 0.0 | **17** | 0457 | -0.1 |
| | 1044 | 0.8 | | 1137 | 0.8 |
| SA | 1603 | 0.3 | **SU** | 1638 | 0.4 |
| ● | 2205 | 1.0 | | 2225 | 1.0 |
| **3** | 0459 | -0.1 | **18** | 0530 | -0.1 |
| | 1121 | 0.8 | | 1216 | 0.8 |
| **SU** | 1638 | 0.3 | M | 1712 | 0.5 |
| | 2235 | 1.0 | | 2250 | 0.9 |
| **4** | 0534 | -0.1 | **19** | 0602 | 0.0 |
| | 1202 | 0.8 | | 1257 | 0.7 |
| M | 1715 | 0.4 | TU | 1748 | 0.5 |
| | 2307 | 1.0 | | 2314 | 0.9 |
| **5** | 0611 | 0.0 | **20** | 0634 | 0.0 |
| | 1248 | 0.8 | | 1341 | 0.7 |
| TU | 1758 | 0.4 | W | 1828 | 0.5 |
| | 2341 | 0.9 | | 2337 | 0.8 |
| **6** | 0653 | 0.0 | **21** | 0707 | 0.1 |
| | 1343 | 0.7 | | 1432 | 0.7 |
| W | 1851 | 0.5 | TH | 1921 | 0.6 |
| **7** | 0020 | 0.8 | **22** | 0001 | 0.7 |
| | 0741 | 0.1 | | 0743 | 0.1 |
| TH | 1454 | 0.7 | F | 1532 | 0.7 |
| | 2007 | 0.5 | | 2047 | 0.6 |
| **8** | 0108 | 0.7 | **23** | 0028 | 0.6 |
| | 0839 | 0.1 | | 0825 | 0.2 |
| F | 1620 | 0.8 | SA | 1638 | 0.7 |
| | 2206 | 0.5 | | 2315 | 0.5 |
| **9** | 0227 | 0.6 | **24** | 0104 | 0.6 |
| | 0952 | 0.2 | | 0919 | 0.3 |
| SA | 1738 | 0.8 | **SU** | 1734 | 0.8 |
| **10** | 0005 | 0.4 | **25** | 0101 | 0.5 |
| | 0450 | 0.6 | | 0417 | 0.5 |
| **SU** | 1112 | 0.2 | M | 1029 | 0.3 |
| | 1834 | 0.9 | | 1817 | 0.8 |
| **11** | 0115 | 0.3 | **26** | 0135 | 0.4 |
| | 0644 | 0.6 | | 0700 | 0.5 |
| M | 1222 | 0.3 | TU | 1142 | 0.4 |
| | 1918 | 0.9 | | 1854 | 0.9 |
| **12** | 0201 | 0.2 | **27** | 0206 | 0.2 |
| | 0755 | 0.6 | | 0809 | 0.6 |
| TU | 1319 | 0.3 | W | 1245 | 0.4 |
| | 1956 | 1.0 | | 1928 | 0.9 |
| **13** | 0241 | 0.1 | **28** | 0236 | 0.1 |
| | 0849 | 0.7 | | 0856 | 0.6 |
| W | 1407 | 0.3 | TH | 1337 | 0.4 |
| | 2030 | 1.0 | | 2001 | 1.0 |
| **14** | 0317 | 0.0 | **29** | 0308 | 0.1 |
| | 0935 | 0.7 | | 0936 | 0.7 |
| TH | 1449 | 0.3 | F | 1424 | 0.4 |
| | 2102 | 1.0 | | 2035 | 1.0 |
| **15** | 0351 | 0.0 | **30** | 0341 | 0.0 |
| | 1017 | 0.8 | | 1014 | 0.7 |
| F | 1528 | 0.3 | SA | 1508 | 0.4 |
| | 2131 | 1.0 | | 2109 | 1.0 |
| | | | **31** | 0414 | -0.1 |
| | | | | 1051 | 0.8 |
| | | | **SU** | 1551 | 0.4 |
| | | | | 2144 | 1.0 |

## JUNE

| | Time | m | | Time | m |
|---|---|---|---|---|---|
| **1** | 0449 | -0.1 | **16** | 0518 | -0.1 |
| | 1129 | 0.8 | | 1215 | 0.8 |
| M | 1635 | 0.4 | TU | 1714 | 0.5 |
| ● | 2220 | 1.0 | | 2240 | 0.9 |
| **2** | 0525 | -0.1 | **17** | 0547 | -0.1 |
| | 1209 | 0.8 | | 1246 | 0.8 |
| TU | 1720 | 0.4 | W | 1752 | 0.5 |
| | 2257 | 1.0 | | 2308 | 0.9 |
| **3** | 0602 | -0.1 | **18** | 0615 | 0.0 |
| | 1251 | 0.8 | | 1316 | 0.8 |
| W | 1808 | 0.4 | TH | 1831 | 0.5 |
| | 2336 | 0.9 | | 2336 | 0.8 |
| **4** | 0640 | -0.1 | **19** | 0642 | 0.0 |
| | 1337 | 0.8 | | 1346 | 0.8 |
| TH | 1903 | 0.5 | F | 1915 | 0.5 |
| **5** | 0018 | 0.8 | **20** | 0006 | 0.7 |
| | 0721 | 0.0 | | 0709 | 0.1 |
| F | 1427 | 0.8 | SA | 1418 | 0.8 |
| | 2009 | 0.5 | | 2008 | 0.5 |
| **6** | 0106 | 0.7 | **21** | 0039 | 0.7 |
| | 0805 | 0.1 | | 0736 | 0.2 |
| SA | 1523 | 0.9 | **SU** | 1455 | 0.8 |
| | 2133 | 0.5 | | 2120 | 0.5 |
| **7** | 0209 | 0.6 | **22** | 0121 | 0.6 |
| | 0856 | 0.2 | | 0806 | 0.2 |
| **SU** | 1625 | 0.9 | M | 1539 | 0.8 |
| | 2310 | 0.4 | | 2256 | 0.4 |
| **8** | 0351 | 0.5 | **23** | 0230 | 0.5 |
| | 0958 | 0.3 | | 0843 | 0.3 |
| M | 1727 | 0.9 | TU | 1633 | 0.8 |
| **9** | 0037 | 0.3 | **24** | 0032 | 0.4 |
| | 0609 | 0.5 | | 0541 | 0.4 |
| TU | 1111 | 0.3 | W | 0943 | 0.4 |
| | 1823 | 0.9 | | 1734 | 0.8 |
| **10** | 0139 | 0.2 | **25** | 0134 | 0.3 |
| | 0751 | 0.6 | | 0815 | 0.5 |
| W | 1226 | 0.4 | TH | 1124 | 0.5 |
| | 1912 | 0.9 | | 1833 | 0.9 |
| **11** | 0226 | 0.1 | **26** | 0217 | 0.1 |
| | 0857 | 0.6 | | 0909 | 0.6 |
| TH | 1332 | 0.4 | F | 1259 | 0.5 |
| | 1956 | 0.9 | | 1926 | 0.9 |
| **12** | 0306 | 0.0 | **27** | 0254 | 0.1 |
| | 0948 | 0.7 | | 0946 | 0.7 |
| F | 1428 | 0.4 | SA | 1409 | 0.5 |
| | 2034 | 1.0 | | 2013 | 1.0 |
| **13** | 0342 | 0.0 | **28** | 0330 | 0.0 |
| | 1030 | 0.7 | | 1020 | 0.7 |
| SA | 1516 | 0.4 | **SU** | 1505 | 0.4 |
| | 2109 | 1.0 | | 2057 | 1.0 |
| **14** | 0416 | -0.1 | **29** | 0405 | -0.1 |
| | 1108 | 0.8 | | 1053 | 0.8 |
| **SU** | 1558 | 0.5 | M | 1554 | 0.4 |
| | 2141 | 1.0 | | 2138 | 1.0 |
| **15** | 0448 | -0.1 | **30** | 0439 | -0.1 |
| | 1143 | 0.8 | | 1126 | 0.9 |
| M | 1637 | 0.5 | TU | 1639 | 0.4 |
| ○ | 2211 | 0.9 | ● | 2218 | 1.0 |

## JULY

| | Time | m | | Time | m |
|---|---|---|---|---|---|
| **1** | 0513 | -0.1 | **16** | 0525 | -0.1 |
| | 1159 | 0.9 | | 1213 | 0.9 |
| W | 1723 | 0.4 | TH | 1741 | 0.4 |
| | 2257 | 1.0 | | 2304 | 0.9 |
| **2** | 0547 | -0.1 | **17** | 0549 | 0.0 |
| | 1233 | 0.9 | | 1234 | 0.9 |
| TH | 1808 | 0.4 | F | 1813 | 0.4 |
| | 2336 | 0.9 | | 2332 | 0.8 |
| **3** | 0622 | -0.1 | **18** | 0612 | 0.0 |
| | 1309 | 0.9 | | 1255 | 0.9 |
| F | 1855 | 0.4 | SA | 1848 | 0.4 |
| **4** | 0015 | 0.8 | **19** | 0001 | 0.8 |
| | 0656 | 0.0 | | 0634 | 0.1 |
| SA | 1347 | 0.9 | **SU** | 1320 | 0.9 |
| | 1946 | 0.4 | | 1927 | 0.4 |
| **5** | 0057 | 0.7 | **20** | 0033 | 0.7 |
| | 0731 | 0.1 | | 0657 | 0.1 |
| **SU** | 1428 | 0.9 | M | 1347 | 0.9 |
| | 2048 | 0.4 | | 2017 | 0.4 |
| **6** | 0146 | 0.6 | **21** | 0109 | 0.6 |
| | 0807 | 0.2 | | 0719 | 0.2 |
| M | 1515 | 0.9 | TU | 1421 | 0.9 |
| | 2207 | 0.4 | | 2125 | 0.4 |
| **7** | 0254 | 0.5 | **22** | 0156 | 0.5 |
| | 0847 | 0.3 | | 0739 | 0.3 |
| TU | 1611 | 0.9 | W | 1506 | 0.8 |
| | 2349 | 0.3 | | 2308 | 0.3 |
| **8** | 0531 | 0.5 | **23** | 0351 | 0.4 |
| | 0942 | 0.4 | | 0742 | 0.4 |
| W | 1720 | 0.8 | TH | 1612 | 0.8 |
| **9** | 0119 | 0.2 | **24** | 0055 | 0.3 |
| | 0822 | 0.5 | | 1745 | 0.8 |
| TH | 1125 | 0.5 | F | | |
| | 1831 | 0.8 | | | |
| **10** | 0218 | 0.1 | **25** | 0157 | 0.2 |
| | 0926 | 0.6 | | 0923 | 0.6 |
| F | 1315 | 0.5 | SA | 1253 | 0.5 |
| | 1932 | 0.9 | | 1907 | 0.8 |
| **11** | 0300 | 0.1 | **26** | 0240 | 0.1 |
| | 1004 | 0.7 | | 0943 | 0.7 |
| SA | 1429 | 0.5 | **SU** | 1417 | 0.5 |
| | 2020 | 0.9 | | 2007 | 0.9 |
| **12** | 0334 | 0.0 | **27** | 0316 | 0.0 |
| | 1036 | 0.8 | | 1009 | 0.8 |
| **SU** | 1521 | 0.5 | M | 1512 | 0.4 |
| | 2100 | 0.9 | | 2056 | 0.9 |
| **13** | 0405 | 0.0 | **28** | 0350 | -0.1 |
| | 1103 | 0.8 | | 1036 | 0.9 |
| M | 1602 | 0.5 | TU | 1556 | 0.4 |
| | 2135 | 0.9 | | 2138 | 1.0 |
| **14** | 0434 | -0.1 | **29** | 0423 | -0.1 |
| | 1128 | 0.8 | | 1104 | 0.9 |
| TU | 1637 | 0.4 | W | 1636 | 0.3 |
| ○ | 2207 | 0.9 | ● | 2217 | 1.0 |
| **15** | 0500 | -0.1 | **30** | 0455 | -0.1 |
| | 1151 | 0.9 | | 1133 | 1.0 |
| W | 1709 | 0.4 | TH | 1715 | 0.3 |
| | 2236 | 0.9 | | 2254 | 1.0 |
| | | | **31** | 0527 | -0.1 |
| | | | | 1202 | 1.0 |
| | | | F | 1753 | 0.2 |
| | | | | 2331 | 0.9 |

## AUGUST

| | Time | m | | Time | m |
|---|---|---|---|---|---|
| **1** | 0557 | -0.1 | **16** | 0540 | 0.1 |
| | 1232 | 1.0 | | 1207 | 1.0 |
| SA | 1833 | 0.2 | **SU** | 1818 | 0.2 |
| | | | | 2352 | 0.8 |
| **2** | 0007 | 0.8 | **17** | 0601 | 0.1 |
| | 0627 | 0.0 | | 1229 | 1.0 |
| **SU** | 1303 | 1.0 | M | 1852 | 0.2 |
| | 1915 | 0.3 | | | |
| **3** | 0044 | 0.8 | **18** | 0022 | 0.7 |
| | 0656 | 0.1 | | 0622 | 0.2 |
| M | 1335 | 0.9 | TU | 1254 | 0.9 |
| | 2003 | 0.3 | | 1933 | 0.3 |
| **4** | 0124 | 0.6 | **19** | 0058 | 0.6 |
| | 0723 | 0.2 | | 0643 | 0.3 |
| TU | 1410 | 0.9 | W | 1324 | 0.9 |
| | 2107 | 0.3 | | 2027 | 0.3 |
| **5** | 0216 | 0.5 | **20** | 0145 | 0.5 |
| | 0745 | 0.3 | | 0700 | 0.3 |
| W | 1451 | 0.8 | TH | 1402 | 0.8 |
| | 2246 | 0.3 | | 2153 | 0.3 |
| **6** | 0531 | 0.5 | **21** | 0332 | 0.5 |
| | 0718 | 0.5 | | 0645 | 0.4 |
| TH | 1555 | 0.8 | F | 1501 | 0.8 |
| **7** | 0056 | 0.3 | **22** | 0001 | 0.3 |
| | 1752 | 0.7 | | 1708 | 0.7 |
| F | | | SA | | |
| **8** | 0206 | 0.2 | **23** | 0126 | 0.2 |
| | 0940 | 0.7 | | 0856 | 0.7 |
| SA | 1344 | 0.6 | **SU** | 1321 | 0.5 |
| | 1923 | 0.8 | | 1903 | 0.8 |
| **9** | 0246 | 0.1 | **24** | 0214 | 0.1 |
| | 0957 | 0.7 | | 0915 | 0.8 |
| **SU** | 1449 | 0.5 | M | 1426 | 0.4 |
| | 2018 | 0.8 | | 2007 | 0.8 |
| **10** | 0318 | 0.0 | **25** | 0253 | 0.0 |
| | 1017 | 0.8 | | 0939 | 0.9 |
| M | 1527 | 0.5 | TU | 1510 | 0.3 |
| | 2058 | 0.8 | | 2054 | 0.9 |
| **11** | 0345 | 0.0 | **26** | 0327 | 0.0 |
| | 1036 | 0.9 | | 1004 | 0.9 |
| TU | 1558 | 0.4 | W | 1548 | 0.3 |
| | 2131 | 0.9 | | 2134 | 0.9 |
| **12** | 0410 | 0.0 | **27** | 0359 | -0.1 |
| | 1054 | 0.9 | | 1031 | 1.0 |
| W | 1625 | 0.4 | TH | 1623 | 0.2 |
| | 2201 | 0.9 | | 2212 | 0.9 |
| **13** | 0434 | 0.0 | **28** | 0430 | -0.1 |
| | 1112 | 0.9 | | 1058 | 1.0 |
| TH | 1652 | 0.3 | F | 1658 | 0.1 |
| ○ | 2229 | 0.9 | ● | 2247 | 0.9 |
| **14** | 0456 | 0.0 | **29** | 0501 | 0.0 |
| | 1129 | 0.9 | | 1125 | 1.0 |
| F | 1719 | 0.3 | SA | 1732 | 0.1 |
| | 2256 | 0.9 | | 2322 | 0.9 |
| **15** | 0518 | 0.0 | **30** | 0530 | 0.0 |
| | 1147 | 0.9 | | 1151 | 1.0 |
| SA | 1747 | 0.2 | **SU** | 1808 | 0.1 |
| | 2323 | 0.8 | | 2357 | 0.8 |
| | | | **31** | 0558 | 0.1 |
| | | | | 1218 | 1.0 |
| | | | M | 1845 | 0.2 |

FOR INTERMEDIATE HEIGHTS USE HARMONIC CONSTANTS (SEE PART III)

| No. | PLACE | Lat. N. | Long. W. | TIME DIFFERENCES High Water | TIME DIFFERENCES Low Water | | | HEIGHT DIFFERENCES (IN METRES) MHWS | MHWN | MLWN | MLWS | M.L. $Z_0$ m. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Zone U.T.(G.M.T.) | | | | | | | | | |
| 81 | **SHOREHAM** (see page 18) | | | **0500 and 1700** | **1000 and 2200** | **0000 and 1200** | **0600 and 1800** | **6·3** | **4·9** | **2·0** | **0·6** | | |
| 72 | Pagham | 50 46 | 0 43 | +0015 | 0000 | −0015 | −0025 | −0·7 | −0·5 | −0·1 | −0·1 | ⊙ | |
| 73 | Bognor Regis | 50 47 | 0 40 | +0010 | −0005 | −0005 | −0020 | −0·6 | −0·5 | −0·2 | −0·1 | 3·14 | |
| | *River Arun* | | | | | | | | | | | | |
| 74 | Littlehampton (Entrance) | 50 48 | 0 32 | +0010 | 0000 | −0005 | −0010 | −0·4 | −0·4 | −0·2 | −0·2 | ⊙ | |
| 74a | Littlehampton (Norfolk Wharf) | 50 48 | 0 33 | +0015 | +0005 | 0000 | +0045 | −0·7 | −0·7 | −0·3 | +0·2 | 2·83 | *c |
| 74b | Arundel | 50 51 | 0 33 | ⊙ | +0120 | ⊙ | ⊙ | −3·1 | −2·8 | ⊙ | ⊙ | ⊙ | |
| 75 | Worthing | 50 48 | 0 22 | +0010 | 0000 | −0005 | −0010 | −0·1 | −0·2 | 0·0 | 0·0 | ⊙ | |
| 81 | **SHOREHAM** | 50 50 | 0 15 | | STANDARD PORT | | | | See Table V | | | 3·40 | |
| 82 | Brighton | 50 49 | 0 08 | −0010 | −0005 | −0005 | −0005 | +0·3 | +0·1 | 0·0 | −0·1 | 3·49 | |
| | | N. | E. | | | | | | | | | | |
| 83 | Newhaven | 50 47 | 0 04 | −0015 | −0010 | 0000 | 0000 | +0·4 | +0·2 | 0·0 | −0·2 | 3·61 | |
| 84 | Eastbourne | 50 46 | 0 17 | −0010 | −0005 | +0015 | +0020 | +1·1 | +0·6 | +0·2 | +0·1 | 3·77 | |
| 89 | **DOVER** (see page 22) | | | **0000 and 1200** | **0600 and 1800** | **0100 and 1300** | **0700 and 1900** | **6·7** | **5·3** | **2·0** | **0·8** | | |
| 85 | Hastings | 50 51 | 0 35 | 0000 | −0010 | −0030 | −0030 | +0·8 | +0·5 | +0·1 | −0·1 | 3·85 | |
| 86 | Rye (Approaches) | 50 55 | 0 47 | +0005 | −0010 | ⊙ | ⊙ | +1·0 | +0·7 | ⊙ | ⊙ | ⊙ | |
| 86a | Rye (Harbour) | 50 56 | 0 46 | +0005 | −0010 | ⊙ | ⊙ | −1·4 | −1·7 | § | § | 1·97 | |
| 87 | Dungeness | 50 54 | 0 58 | −0010 | −0015 | −0020 | −0010 | +1·0 | +0·6 | +0·4 | +0·1 | 4·13 | |
| 88 | Folkestone | 51 05 | 1 12 | −0020 | −0005 | −0010 | −0010 | +0·4 | +0·4 | 0·0 | −0·1 | 3·74 | |
| 89 | **DOVER** | 51 07 | 1 19 | | STANDARD PORT | | | | See Table V | | | 3·70 | |
| 98 | Deal | 51 13 | 1 25 | +0010 | +0020 | +0010 | +0005 | −0·6 | −0·3 | 0·0 | 0·0 | 3·54 | |
| 99 | Richborough | 51 18 | 1 21 | +0015 | +0015 | +0030 | +0030 | −3·4 | −2·6 | −1·7 | −0·7 | 1·42 | *c* |
| 102 | Ramsgate | 51 20 | 1 25 | +0020 | +0020 | −0007 | −0007 | −1·8 | −1·5 | −0·8 | −0·4 | 2·56 | |
| 103 | **MARGATE** (see page 26) | | | **0100 and 1300** | **0700 and 1900** | **0100 and 1300** | **0700 and 1900** | **4·8** | **3·9** | **1·4** | **0·5** | | |
| 102a | Broadstairs | 51 21 | 1 27 | −0020 | −0008 | +0007 | +0010 | −0·2 | −0·2 | −0·1 | −0·1 | ⊙ | |
| 103 | **MARGATE** | 51 24 | 1 23 | | STANDARD PORT | | | | See Table V | | | 2·64 | |
| 104 | Herne Bay | 51 23 | 1 07 | +0034 | +0022 | +0015 | +0032 | +0·4 | +0·4 | 0·0 | 0·0 | 2·73 | |
| 105 | Whitstable Approaches | 51 22 | 1 02 | +0042 | +0029 | +0025 | +0050 | +0·6 | +0·6 | +0·1 | 0·0 | ⊙ | |
| 108 | **SHEERNESS** (see page 30) | | | **0200 and 1400** | **0800 and 2000** | **0200 and 1400** | **0700 and 1900** | **5·7** | **4·8** | **1·5** | **0·6** | | |
| | *River Swale* | | | | | | | | | | | | |
| 106 | Grovehurst Jetty | 51 22 | 0 46 | −0007 | 0000 | 0000 | +0016 | 0·0 | 0·0 | 0·0 | −0·1 | ⊙ | |
| | *River Medway* | | | | | | | | | | | | |
| 108 | **SHEERNESS** | 51 27 | 0 45 | | STANDARD PORT | | | | See Table V | | | 3·06 | |
| 108a | Bee Ness | 51 25 | 0 39 | +0002 | +0002 | 0000 | +0005 | +0·2 | +0·1 | 0·0 | 0·0 | 2·98 | |
| 108b | Bartlett Creek | 51 23 | 0 38 | +0016 | +0008 | ⊙ | ⊙ | +0·1 | 0·0 | ⊙ | ⊙ | ⊙ | |
| 108c | Darnett Ness | 51 24 | 0 36 | +0004 | +0004 | 0000 | +0010 | +0·2 | +0·1 | 0·0 | −0·1 | ⊙ | |
| 109 | Chatham (Lock Approaches) | 51 24 | 0 33 | +0010 | +0012 | +0012 | +0018 | +0·3 | +0·1 | −0·1 | −0·2 | 2·95 | |
| 109a | Upnor | 51 25 | 0 32 | +0015 | +0015 | +0015 | +0025 | +0·2 | +0·2 | −0·1 | −0·1 | ⊙ | |
| 109b | Rochester (Strood Pier) | 51 24 | 0 30 | +0018 | +0018 | +0018 | +0028 | +0·2 | +0·2 | −0·2 | −0·3 | 2·91 | |
| 109c | Wouldham | 51 21 | 0 27 | +0030 | +0025 | +0035 | +0120 | −0·2 | −0·3 | −1·0 | −0·3 | 2·69 | |
| 109d | New Hythe | 51 19 | 0 28 | +0035 | +0035 | +0220 | +0240 | −1·6 | −1·7 | −1·2 | −0·3 | 2·03 | |
| 109e | Allington Lock | 51 17 | 0 30 | +0050 | +0035 | ⊙ | ⊙ | −2·1 | −2·2 | −1·3 | −0·4 | 0·96 | |
| | *River Thames* | | | | | | | | | | | | |
| 110 | Southend-on-Sea | 51 31 | 0 43 | −0005 | −0005 | −0005 | −0005 | 0·0 | 0·0 | −0·1 | −0·1 | 3·02 | * |
| 110a | Thames Haven | 51 30 | 0 31 | +0010 | +0010 | 0000 | +0010 | +0·5 | +0·4 | −0·1 | −0·1 | 3·15 | * |

⊙ No data.
* See notes on page 344.
§ Dries out except for river water.
*c* For intermediate heights, use harmonic constants (see Part III).
*x* M.L. inferred.

| No. | PLACE | Lat. N. | Long. E. | TIME DIFFERENCES High Water | | Low Water | | HEIGHT DIFFERENCES (IN METRES) MHWS | MHWN | MLWN | MLWS | M.L. $Z_0$ m. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Zone U.T.(G.M.T.) | | | | | | | | | |
| 113 | **LONDON BRIDGE** | (see page 34) | | **0300 and 1500** | **0900 and 2100** | **0400 and 1600** | **1100 and 2300** | **7·1** | **5·9** | **1·3** | **0·5** | | |
| 111 | Tilbury | 51 27 | 0 22 | −0055 | −0040 | −0050 | −0115 | −0·7 | −0·5 | +0·1 | 0·0 | 3·33 | ★ |
| 112 | Woolwich (Gallion's Point) | 51 30 | 0 05 | −0020 | −0020 | −0035 | −0045 | −0·1 | 0·0 | +0·2 | 0·0 | 3·67 | ★ |
| | | N. | W. | | | | | | | | | | |
| 113 | **LONDON BRIDGE** | 51 30 | 0 05 | | | STANDARD PORT | | | | See Table V | | 3·63 | ★ |
| 114 | Chelsea Bridge | 51 29 | 0 09 | +0020 | +0015 | +0055 | +0100 | −0·8 | −0·7 | −0·6 | −0·3 | ⊙ | ★ |
| 115 | Barnes Bridge | 51 28 | 0 15 | +0045 | +0040 | +0220 | +0210 | −1·6 | −1·6 | −1·1 | −0·5 | ⊙ | ★ |
| 116 | Richmond Lock | 51 28 | 0 19 | +0100 | +0055 | +0325 | +0305 | −2·2 | −2·2 | −1·3 | −0·5 | ⊙ | ★ |
| 108 | **SHEERNESS** | (see page 30) | | **0200 and 1400** | **0700 and 1900** | **0100 and 1300** | **0700 and 1900** | **5·7** | **4·8** | **1·5** | **0·6** | | |
| | | N. | E. | | | | | | | | | | |
| | *Thames Estuary* | | | | | | | | | | | | |
| 116a | Shivering Sand Tower | 51 30 | 1 05 | −0025 | −0019 | −0008 | −0026 | −0·6 | −0·6 | −0·1 | −0·1 | 2·75 | |
| 103 | **MARGATE** | (see page 26) | | **0100 and 1300** | **0700 and 1900** | **0100 and 1300** | **0700 and 1900** | **4·8** | **3·9** | **1·4** | **0·5** | | |
| 117 | S.E. Long Sand | 51 32 | 1 21 | −0006 | −0003 | −0004 | −0004 | 0·0 | +0·1 | 0·0 | −0·1 | 2·5 | *x* |
| 129 | **WALTON-ON-THE-NAZE** | (see page 38) | | **0000 and 1200** | **0600 and 1800** | **0500 and 1700** | **1100 and 2300** | **4·2** | **3·4** | **1·1** | **0·4** | | |
| 121 | Whitaker Beacon | 51 40 | 1 06 | +0022 | +0024 | +0033 | +0027 | +0·6 | +0·5 | +0·2 | +0·1 | 2·5 | ⊙*x* |
| 121a | Holliwell Point | 51 38 | 0 56 | +0034 | +0037 | +0100 | +0037 | +1·1 | +0·9 | +0·3 | +0·1 | ⊙ | |
| | *River Roach* | | | | | | | | | | | | |
| 121b | Rochford | 51 35 | 0 43 | +0050 | +0040 | § | § | −0·8 | −1·1 | § | § | ⊙ | |
| | *River Crouch* | | | | | | | | | | | | |
| 122 | Burnham-on-Crouch | 51 37 | 0 48 | +0050 | +0035 | +0115 | +0050 | +1·0 | +0·8 | −0·1 | −0·2 | 2·50 | *c* |
| 122a | North Fambridge | 51 38 | 0 41 | +0115 | +0050 | +0130 | +0100 | +1·1 | +0·8 | 0·0 | −0·1 | 2·55 | *c* |
| 122b | Hullbridge | 51 38 | 0 38 | +0115 | +0050 | +0135 | +0105 | +1·1 | +0·8 | 0·0 | −0·1 | 2·55 | *c* |
| 122c | Battlesbridge | 51 37 | 0 34 | +0120 | +0110 | § | § | −1·8 | −2·0 | § | § | ⊙ | |
| | *River Blackwater* | | | | | | | | | | | | |
| 123 | Bradwell-on-Sea | 51 45 | 0 53 | +0035 | +0023 | +0047 | +0004 | +1·1 | +0·8 | +0·2 | +0·1 | 2·85 | *c* |
| 123a | Osea Island | 51 43 | 0 46 | +0057 | +0045 | +0050 | +0007 | +1·1 | +0·9 | +0·1 | 0·0 | 2·68 | |
| 123b | Maldon | 51 44 | 0 42 | +0107 | +0055 | ⊙ | ⊙ | −1·3 | −1·1 | ⊙ | ⊙ | ⊙ | |
| 124 | West Mersea | 51 47 | 0 54 | +0035 | +0015 | +0055 | +0010 | +0·9 | +0·4 | +0·1 | +0·1 | 2·7 | *cx* |
| | *River Colne* | | | | | | | | | | | | |
| 126 | Brightlingsea | 51 48 | 1 00 | +0025 | +0021 | +0046 | +0004 | +0·8 | +0·4 | +0·1 | 0·0 | 2·84 | |
| 127 | Colchester | 51 53 | 0 56 | +0035 | +0025 | § | § | 0·0 | −0·3 | § | § | ⊙ | |
| 128 | Clacton-on-Sea | 51 47 | 1 09 | +0012 | +0010 | +0025 | +0008 | +0·3 | +0·1 | 0·0 | 0·0 | 2·38 | |
| 129 | **WALTON-ON-THE-NAZE** | 51 51 | 1 16 | | | STANDARD PORT | | | | See Table V | | 2·23 | |
| 129a | Bramble Creek | 51 53 | 1 14 | +0010 | −0007 | −0005 | +0010 | +0·3 | +0·3 | +0·3 | +0·3 | 2·38 | |
| 130 | Sunk Head | 51 46 | 1 30 | 0000 | +0002 | −0002 | +0002 | −0·3 | −0·3 | −0·1 | −0·1 | 2·08 | |
| 131 | **HARWICH** | (see page 42) | | **0000 and 1200** | **0600 and 1800** | **0000 and 1200** | **0600 and 1800** | **4·0** | **3·4** | **1·1** | **0·4** | 2·10 | |
| | *River Stour* | | | | | | | | | | | | |
| 132 | Mistley | 51 57 | 1 05 | +0025 | +0025 | 0000 | +0020 | +0·2 | 0·0 | −0·1 | −0·1 | ⊙ | |
| | *River Orwell* | | | | | | | | | | | | |
| 133 | Ipswich | 52 03 | 1 10 | +0015 | +0025 | 0000 | +0010 | +0·2 | 0·0 | −0·1 | −0·1 | 2·44 | *c* |

SEASONAL CHANGES IN MEAN LEVEL

| No. | Jan. 1 | Feb. 1 | Mar. 1 | Apr. 1 | May 1 | June 1 | July 1 | Aug. 1 | Sep. 1 | Oct. 1 | Nov. 1 | Dec. 1 | Jan. 1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 72–133 | | | | | | Negligible | | | | | | | |

| No. | PLACE | Lat. N. | Long. W. | TIME DIFFERENCES High Water Zone U.T.(G.M.T.) | | Low Water | | HEIGHT DIFFERENCES (IN METRES) MHWS | MHWN | MLWN | MLWS | M.L. $Z_0$ m. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 404 | **GREENOCK** . . . . | (see page 90) | | 0000 and 1200 | 0600 and 1800 | 0000 and 1200 | 0600 and 1800 | 3·4 | 2·9 | 1·0 | 0·4 | | |
| | *Loch Fyne* | | | | | | | | | | | | |
| 394 | East Loch Tarbert . . | 55 52 | 5 24 | +0005 | +0005 | −0020 | +0015 | 0·0 | 0·0 | +0·1 | −0·1 | 1·92 | |
| 395 | Inveraray . . . . | 56 14 | 5 04 | +0011 | +0011 | +0034 | +0034 | −0·1 | +0·1 | −0·5 | −0·2 | ⊙ | |
| | *Kyles of Bute* | | | | | | | | | | | | |
| 396 | Rubha Bodach . . | 55 55 | 5 09 | −0020 | −0010 | −0007 | −0007 | −0·2 | −0·1 | +0·2 | +0·2 | 1·78 | |
| 396a | Tighnabruich . . | 55 55 | 5 13 | +0007 | −0010 | −0002 | −0015 | 0·0 | +0·2 | +0·4 | +0·5 | 2·08 | |
| | *Firth of Clyde (cont.)* | | | | | | | | | | | | |
| 398 | Millport . . . . | 55 45 | 4 56 | −0005 | −0025 | −0025 | −0005 | 0·0 | −0·1 | 0·0 | +0·1 | 1·94 | |
| 399 | Rothesay Bay . . | 55 51 | 5 03 | −0020 | −0015 | −0010 | −0002 | +0·2 | +0·2 | +0·2 | +0·2 | 1·90 | |
| 399a | Wemyss Bay . . . | 55 53 | 4 53 | −0005 | −0005 | −0005 | −0005 | 0·0 | 0·0 | +0·1 | +0·1 | ⊙ | |
| | *Loch Long* | | | | | | | | | | | | |
| 399b | Coulport . . . . | 56 03 | 4 53 | −0005 | −0005 | −0005 | −0005 | 0·0 | 0·0 | −0·1 | −0·1 | 1·82 | |
| 399c | Lochgoilhead . . | 56 10 | 4 54 | +0015 | 0000 | −0005 | −0005 | −0·2 | −0·3 | −0·3 | −0·3 | 1·71 | |
| 401 | Arrochar . . . . | 56 12 | 4 45 | −0005 | −0005 | −0005 | −0005 | 0·0 | 0·0 | −0·1 | −0·1 | ⊙ | |
| | *Gare Loch* | | | | | | | | | | | | |
| 402 | Rosneath (Rhu Pier) . | 56 01 | 4 47 | −0005 | −0005 | −0005 | −0005 | 0·0 | −0·1 | 0·0 | 0·0 | 2·02 | |
| 402a | Shandon . . . . | 56 03 | 4 49 | −0005 | −0005 | −0005 | −0005 | 0·0 | 0·0 | 0·0 | −0·1 | ⊙ | |
| 402b | Garelochhead . . | 56 05 | 4 50 | 0000 | 0000 | 0000 | 0000 | 0·0 | 0·0 | 0·0 | −0·1 | ⊙ | |
| | *River Clyde* | | | | | | | | | | | | |
| 403 | Helensburgh . . . | 56 00 | 4 44 | 0000 | 0000 | 0000 | 0000 | 0·0 | 0·0 | 0·0 | 0·0 | ⊙ | |
| 404 | **GREENOCK** . . | 55 57 | 4 46 | STANDARD PORT | | | | | See Table V | | | 1·99 | |
| 405 | Port Glasgow . . | 55 56 | 4 41 | +0010 | +0005 | +0010 | +0020 | +0·2 | +0·1 | 0·0 | 0·0 | ⊙ | |
| 406 | Bowling . . . . | 55 56 | 4 29 | +0020 | +0010 | +0030 | +0055 | +0·6 | +0·5 | +0·3 | +0·1 | ⊙ | |
| 406a | Renfrew . . . . | 55 53 | 4 23 | +0025 | +0015 | +0035 | +0100 | +0·9 | +0·8 | +0·5 | +0·2 | ⊙ | |
| 407 | Glasgow . . . . | 55 51 | 4 17 | +0025 | +0015 | +0035 | +0105 | +1·3 | +1·2 | +0·6 | +0·4 | 2·77 | *c* |
| | *Firth of Clyde (cont.)* | | | | | | | | | | | | |
| 408 | Brodick Bay . . . | 55 35 | 5 08 | 0000 | 0000 | +0005 | +0005 | −0·2 | −0·2 | 0·0 | 0·0 | 1·86 | |
| 409 | Lamlash . . . . | 55 32 | 5 07 | −0016 | −0036 | −0024 | −0004 | −0·2 | −0·2 | ⊙ | ⊙ | ⊙ | |
| 410 | Ardrossan . . . . | 55 38 | 4 49 | −0020 | −0010 | −0010 | −0010 | −0·2 | −0·2 | +0·1 | +0·1 | 1·86 | |
| 411 | Irvine . . . . | 55 36 | 4 41 | −0020 | −0020 | −0030 | −0010 | −0·3 | −0·3 | −0·1 | 0·0 | ⊙ | |
| 412 | Troon . . . . | 55 33 | 4 41 | −0025 | −0025 | −0020 | −0020 | −0·2 | −0·2 | 0·0 | 0·0 | 1·91 | |
| 413 | Ayr . . . . | 55 28 | 4 39 | −0025 | −0025 | −0030 | −0015 | −0·4 | −0·3 | +0·1 | +0·1 | ⊙ | |
| 414 | Girvan . . . . | 55 15 | 4 52 | −0025 | −0040 | −0035 | −0010 | −0·3 | −0·3 | −0·1 | 0·0 | 1·82 | |
| | *Loch Ryan* | | | | | | | | | | | | |
| 414a | Stranraer . . . | 54 55 | 5 03 | −0020 | −0020 | −0017 | −0017 | −0·4 | −0·4 | −0·4 | −0·2 | ⊙ | |
| 452 | **LIVERPOOL** . . . . | (see page 94) | | 0000 and 1200 | 0600 and 1800 | 0200 and 1400 | 0800 and 2000 | 9·3 | 7·4 | 2·9 | 0·9 | | |
| 415 | Portpatrick . . . | 54 50 | 5 07 | +0018 | +0026 | 0000 | −0035 | −5·5 | −4·4 | −2·0 | −0·6 | 2·08 | |
| | *Wigtown Bay* | | | | | | | | | | | | |
| 420 | Drummore . . . | 54 41 | 4 53 | +0030 | +0040 | +0015 | +0020 | −3·4 | −2·5 | −0·9 | −0·3 | 3·32 | |
| 420a | Port William . . | 54 43 | 4 40 | +0030 | +0030 | +0025 | 0000 | −2·9 | −2·2 | −0·8 | ⊙ | ⊙ | |
| 421 | Isle of Whithorn . | 54 42 | 4 22 | +0020 | +0025 | +0025 | +0005 | −2·4 | −2·0 | −0·8 | −0·2 | 3·74 | |
| 422 | Garlieston . . . | 54 47 | 4 21 | +0025 | +0035 | +0030 | +0005 | −2·3 | −1·7 | −0·5 | ⊙ | ⊙ | |
| | *Solway Firth* | | | | | | | | | | | | |
| 422a | Kirkcudbright Bay . | 54 48 | 4 04 | +0015 | +0015 | +0010 | 0000 | −1·8 | −1·5 | −0·5 | −0·1 | ⊙ | |
| 424 | Hestan Islet . . . | 54 50 | 3 48 | +0025 | +0025 | +0020 | +0025 | −1·0 | −1·1 | −0·5 | 0·0 | 4·21 | |
| 425 | Southerness Point . | 54 52 | 3 36 | +0030 | +0030 | +0030 | +0010 | −0·7 | −0·7 | ⊙ | ⊙ | ⊙ | |
| 426 | Annan Waterfoot . . | 54 58 | 3 16 | +0050 | +0105 | +0220 | +0310 | −2·2 | −2·6 | −2·7 | ‡ | ⊙ | ★ |
| 430 | Torduff Point . . | 54 58 | 3 09 | +0105 | +0140 | +0520 | +0410 | −4·1 | −4·9 | ‡ | ‡ | ⊙ | ★ |
| 431 | Redkirk . . . . | 54 59 | 3 06 | +0110 | +0215 | +0715 | +0445 | −5·5 | −6·2 | ‡ | ‡ | ⊙ | ★ |
| | **England** | | | | | | | | | | | | |
| 432 | Silloth . . . . | 54 52 | 3 24 | +0030 | +0040 | +0045 | +0055 | −0·1 | −0·3 | −0·6 | −0·1 | ⊙ | |
| 433 | Maryport . . . | 54 43 | 3 30 | +0017 | +0032 | +0020 | +0005 | −0·7 | −0·8 | −0·4 | 0·0 | ⊙ | |
| 434 | Workington . . . | 54 39 | 3 34 | +0020 | +0020 | +0020 | +0010 | −1·1 | −1·0 | −0·1 | +0·3 | 4·42 | |
| 435 | Whitehaven . . . | 54 33 | 3 36 | +0005 | +0015 | +0010 | +0005 | −1·3 | −1·1 | −0·5 | +0·1 | 4·53 | |

⊙ No data.
§ Dries out except for river water.
‡ The tide does not normally fall below Chart Datum.
★ See notes on page 344.
*c* For intermediate heights, use harmonic constants (see Part III).
*x* M.L. inferred.

| No. | PLACE | Lat. N. | Long. W. | TIME DIFFERENCES High Water | TIME DIFFERENCES Low Water | | | HEIGHT DIFFERENCES (IN METRES) MHWS | MHWN | MLWN | MLWS | M.L. $Z_0$ m. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Zone U.T.(G.M.T.) | | | | | | | | | |
| **452** | **LIVERPOOL** (see page 94) | | | **0000 and 1200** | **0600 and 1800** | **0200 and 1400** | **0700 and 1900** | **9·3** | **7·4** | **2·9** | **0·9** | | |
| 436 | Tarn Point | 54 17 | 3 25 | +0005 | +0005 | +0010 | 0000 | −1·0 | −1·0 | −0·4 | 0·0 | ⊙ | |
| 437 | Duddon Bar | 54 09 | 3 20 | +0003 | +0003 | +0008 | +0002 | −0·8 | −0·8 | −0·3 | 0·0 | ⊙ | |
| | *Morecambe Bay* | | | | | | | | | | | | |
| 439 | Barrow (Ramsden Dock) | 54 06 | 3 12 | +0015 | +0015 | +0015 | +0015 | −0·2 | −0·3 | −0·1 | +0·1 | 5·00 | |
| 439a | Roa Island | 54 04 | 3 10 | +0010 | +0010 | +0010 | +0010 | −0·2 | −0·3 | −0·1 | −0·1 | 5·00 | |
| 439b | Haws Point | 54 03 | 3 10 | +0010 | +0010 | +0010 | +0010 | −0·1 | −0·3 | −0·1 | +0·1 | 4·89 | |
| 439c | Halfway Shoal | 54 02 | 3 12 | +0003 | +0003 | +0003 | +0003 | −0·5 | −0·6 | −0·2 | 0·0 | 4·7 | *x* |
| 440 | Ulverston | 54 11 | 3 04 | +0020 | +0040 | ⊙ | ⊙ | 0·0 | −0·1 | ⊙ | ⊙ | ⊙ | |
| 440a | Arnside | 54 12 | 2 51 | +0100 | +0135 | ⊙ | ⊙ | +0·5 | +0·2 | ⊙ | ⊙ | ⊙ | |
| 440b | Morecambe | 54 04 | 2 52 | +0005 | +0010 | +0030 | +0015 | +0·2 | 0·0 | 0·0 | +0·2 | ⊙ | |
| 441 | Heysham | 54 02 | 2 55 | +0005 | +0005 | +0015 | 0000 | +0·1 | 0·0 | 0·0 | +0·2 | 5·10 | |
| | *River Lune* | | | | | | | | | | | | |
| 442 | Glasson Dock | 54 00 | 2 51 | +0020 | +0030 | +0220 | +0240 | −2·7 | −3·0 | ⊙ | ⊙ | ⊙ | * |
| 442a | Lancaster | 54 03 | 2 49 | +0110 | +0030 | ⊙ | ⊙ | −5·0 | −4·9 | § | § | ⊙ | |
| | *River Wyre* | | | | | | | | | | | | |
| 443 | Wyre Lighthouse | 53 57 | 3 02 | −0010 | −0010 | +0005 | 0000 | −0·1 | −0·1 | ⊙ | ⊙ | ⊙ | |
| 444 | Fleetwood | 53 56 | 3 00 | 0000 | 0000 | +0005 | 0000 | −0·1 | −0·1 | +0·1 | +0·3 | 4·98 | |
| 445 | Blackpool | 53 49 | 3 04 | −0015 | −0005 | −0005 | −0015 | −0·4 | −0·4 | −0·1 | +0·1 | ⊙ | |
| | *River Ribble* | | | | | | | | | | | | |
| 446 | Preston | 53 46 | 2 45 | +0010 | +0010 | +0335 | +0310 | −4·0 | −4·1 | −2·8 | −0·8 | ⊙ | * |
| | *Liverpool Bay* | | | | | | | | | | | | |
| 447 | Southport | 53 39 | 3 01 | −0020 | −0010 | ⊙ | ⊙ | −0·3 | −0·3 | ⊙ | ⊙ | ⊙ | |
| 448 | Formby | 53 32 | 3 07 | −0015 | −0010 | −0020 | −0020 | −0·3 | −0·1 | 0·0 | +0·1 | 5·15 | |
| 450 | Rock Channel | 53 27 | 3 07 | −0030 | −0030 | −0030 | −0030 | −0·4 | −0·2 | −0·2 | 0·0 | ⊙ | |
| 451 | New Brighton | 53 26 | 3 02 | −0008 | −0008 | −0006 | −0006 | −0·1 | −0·3 | +0·1 | +0·2 | 5.04 | |
| | *River Mersey* | | | | | | | | | | | | |
| 452 | **LIVERPOOL** | 53 25 | 3 00 | | STANDARD PORT | | | | See Table V | | | 5·14 | |
| 453 | Eastham | 53 19 | 2 57 | +0003 | +0006 | +0015 | +0030 | +0·4 | +0·3 | −0·1 | −0·1 | 5·3 | *x* |
| 455 | Hale Head | 53 19 | 2 48 | +0030 | +0025 | ⊙ | ⊙ | −2·4 | −2·5 | ⊙ | ⊙ | ⊙ | |
| 456 | Widnes | 53 21 | 2 44 | +0040 | +0045 | +0400 | +0345 | −4·2 | −4·4 | −2·5 | −0·3 | ⊙ | |
| 456a | Fiddler's Ferry | 53 22 | 2 39 | +0100 | +0115 | +0540 | +0450 | −5·9 | −6·3 | −2·4 | −0·4 | ⊙ | |
| | *River Dee* | | | | | | | | | | | | |
| 461 | Hilbre Island | 53 23 | 3 13 | −0015 | −0012 | −0010 | −0015 | −0·3 | −0·2 | +0·2 | +0·4 | 5·14 | |
| 462 | Mostyn Quay | 53 19 | 3 16 | −0020 | −0015 | −0020 | −0020 | −0·8 | −0·7 | ⊙ | ⊙ | ⊙ | |
| 463 | Connah's Quay | 53 13 | 3 03 | 0000 | +0015 | +0355 | +0340 | −4·6 | −4·4 | § | § | ⊙ | * |
| 464 | Chester | 53 12 | 2 54 | +0105 | +0105 | +0500 | +0500 | −5·3 | −5·4 | § | § | ⊙ | * |
| | *Isle of Man* | | | | | | | | | | | | |
| 466 | Peel | 54 14 | 4 42 | −0015 | +0010 | 0000 | −0010 | −4·0 | −3·2 | −1·4 | −0·4 | 2·90 | |
| 467 | Ramsey | 54 19 | 4 22 | +0005 | +0015 | −0005 | −0015 | −1·7 | −1·5 | −0·6 | +0·1 | 4·16 | |
| 468 | Douglas | 54 09 | 4 28 | −0004 | −0004 | −0022 | −0032 | −2·4 | −2·0 | −0·5 | −0·1 | 3·78 | |
| 468a | Port St. Mary | 54 04 | 4 44 | +0005 | +0015 | −0010 | −0030 | −3·4 | −2·7 | −1·2 | −0·3 | 3·21 | |
| 469 | Calf Sound | 54 04 | 4 48 | +0005 | +0005 | −0015 | −0025 | −3·2 | −2·6 | −0·9 | −0·3 | ⊙ | |
| 469a | Port Erin | 54 05 | 4 46 | −0005 | +0015 | −0010 | −0050 | −4·1 | −3·2 | −1·3 | −0·5 | 2·73 | |
| | **Wales** | | | | | | | | | | | | |
| 470 | Colwyn Bay | 53 18 | 3 43 | −0035 | −0025 | ⊙ | ⊙ | −1·5 | −1·3 | ⊙ | ⊙ | ⊙ | |
| 471 | Llandudno | 53 20 | 3 50 | −0035 | −0025 | −0025 | −0035 | −1·9 | −1·5 | −0·5 | −0·2 | 4·03 | |
| **478** | **HOLYHEAD** (see page 98) | | | **0000 and 1200** | **0600 and 1800** | **0500 and 1700** | **1100 and 2300** | **5·7** | **4·5** | **2·0** | **0·7** | | |
| 471a | Conwy | 53 17 | 3 50 | +0020 | +0020 | ⊙ | +0050 | +2·1 | +1·6 | +0·3 | ⊙ | ⊙ | |
| | *Menai Strait* | | | | | | | | | | | | |
| 472 | Beaumaris | 53 16 | 4 05 | +0025 | +0010 | +0055 | +0035 | +2·0 | +1·6 | +0·5 | +0·1 | 4·22 | |
| 473 | Menai Bridge | 53 13 | 4 09 | +0030 | +0010 | +0100 | +0035 | +1·7 | +1·4 | +0·3 | 0·0 | 4·05 | |
| 474 | Port Dinorwic | 53 11 | 4 13 | −0015 | −0025 | +0030 | 0000 | 0·0 | 0·0 | 0·0 | +0·1 | 3·38 | |
| 475 | Caernarfon | 53 09 | 4 16 | −0030 | −0030 | +0015 | −0005 | −0·4 | −0·4 | −0·1 | −0·1 | 3·04 | |
| 475a | Fort Belan | 53 07 | 4 20 | −0040 | −0015 | −0025 | −0005 | −1·0 | −0·9 | −0·2 | −0·1 | 2·83 | |

SEASONAL CHANGES IN MEAN LEVEL

| No. | Jan. 1 | Feb. 1 | Mar. 1 | Apr. 1 | May 1 | June 1 | July 1 | Aug. 1 | Sep. 1 | Oct. 1 | Nov. 1 | Dec. 1 | Jan. 1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 394–398 | +0·1 | 0·0 | −0·1 | −0·1 | −0·1 | −0·1 | 0·0 | 0·0 | 0·0 | 0·0 | +0·1 | +0·1 | +0·1 |
| 399–407 | +0·2 | +0·1 | 0·0 | −0·1 | −0·1 | −0·1 | −0·1 | −0·1 | 0·0 | 0·0 | +0·1 | +0·2 | +0·2 |
| 408–414a | +0·1 | 0·0 | −0·1 | −0·1 | −0·1 | −0·1 | 0·0 | 0·0 | 0·0 | 0·0 | +0·1 | +0·1 | +0·1 |
| 415–444 | 0·0 | 0·0 | 0·0 | −0·1 | −0·1 | 0·0 | 0·0 | 0·0 | 0·0 | 0·0 | +0·1 | +0·1 | 0·0 |
| 445–464 | 0·0 | 0·0 | −0·1 | −0·1 | 0·0 | 0·0 | 0·0 | 0·0 | 0·0 | 0·0 | +0·1 | +0·1 | 0·0 |
| 466–478 | +0·1 | 0·0 | 0·0 | −0·1 | −0·1 | −0·1 | 0·0 | 0·0 | 0·0 | 0·0 | +0·1 | +0·1 | +0·1 |

| No. | PLACE | Lat. N. | Long. E. | TIME DIFFERENCES High Water | TIME DIFFERENCES Low Water | | | HEIGHT DIFFERENCES (IN METRES) MHWS | MHWN | MLWN | MLWS | M.L. $Z_0$ m. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Zone −0100 | | | | | | | | | |
| 1417 | **ESBJERG** . . . . (see page 158) | | | **0300 and 1500** | **0700 and 1900** | **0100 and 1300** | **0800 and 2000** | **1·6** | **1·4** | **0·2** | **−0·1** | | |
| 1412 | Hirtshals . . . . | D | 57 36 9 57 | +0055 | +0320 | +0340 | +0100 | −1·3 | −1·1 | −0·1 | +0·1 | 0·2 | x |
| 1412a | Hanstholm . . . . | D | 57 08 8 36 | +0100 | +0340 | +0340 | +0130 | −1·3 | −1·1 | −0·1 | +0·1 | 0·2 | x |
| 1413 | Thyboron . . . . | D | 56 42 8 13 | +0120 | +0230 | +0410 | +0210 | −1·2 | −1·1 | −0·1 | +0·1 | 0·2 | x |
| 1414 | Torsminde . . . . | D | 56 22 8 07 | +0030 | +0050 | +0040 | +0010 | −0·7 | −0·7 | −0·1 | +0·1 | ⊙ | |
| 1416 | Blavandshuk . . . . | | 55 33 8 05 | −0120 | −0110 | −0050 | −0100 | +0·2 | 0·0 | +0·1 | +0·1 | ⊙ | |
| 1417 | **ESBJERG** . . . . | | 55 28 8 26 | STANDARD PORT | | | | See Table V | | | | 0·81 | |
| 1418 | Gradyb Bar . . . . | | 55 26 8 15 | −0130 | −0115 | ⊙ | ⊙ | −0·1 | −0·2 | +0·1 | +0·1 | ⊙ | |
| 1419 | Rømø Havn . . . . | D | 55 05 8 34 | −0040 | −0005 | 0000 | −0020 | +0·3 | +0·2 | +0·1 | +0·1 | 1·0 | x |
| 1420 | Højer . . . . | | 54 58 8 40 | −0020 | +0015 | ⊙ | ⊙ | +0·8 | +0·7 | +0·2 | +0·1 | ⊙ | |
| 1431 | **HELGOLAND** . . . . (see page 162) | | | **0100 and 1300** | **0600 and 1800** | **0100 and 1300** | **0800 and 2000** | **2·7** | **2·3** | **0·4** | **0·0** | | |
| | **Germany** | | | | | | | | | | | | |
| | *Lister Tief* | | | | | | | | | | | | |
| 1421 | Landfall Buoy . . . | | 55 05 8 17 | +0150 | +0150 | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ | |
| 1421a | List . . . . | | 55 01 8 27 | +0256 | +0246 | +0207 | +0213 | −0·8 | −0·6 | −0·2 | 0·0 | ⊙ | |
| 1423 | Hörnum . . . . | | 54 46 8 18 | +0225 | +0221 | +0134 | +0143 | −0·5 | −0·3 | −0·2 | 0·0 | ⊙ | |
| 1425 | Amrum-Hafen . . . | | 54 38 8 23 | +0144 | +0140 | +0129 | +0140 | +0·2 | +0·3 | −0·1 | 0·0 | ⊙ | |
| 1426 | Dagebüll . . . . | | 54 44 8 41 | +0230 | +0222 | +0217 | +0231 | +0·5 | +0·6 | −0·1 | 0·0 | ⊙ | |
| 1427 | Schmal-Tief Buoy . . | | 54 25 8 15 | +0045 | +0045 | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ | |
| 1428 | Suderoogsand . . . | | 54 25 8 30 | +0116 | +0102 | +0038 | +0122 | +0·3 | +0·3 | +0·1 | 0·0 | ⊙ | |
| | *Hever* | | | | | | | | | | | | |
| 1430 | Husum . . . . | G | 54 28 9 02 | +0213 | +0159 | +0128 | +0212 | +1·1 | +1·1 | +0·1 | 0·0 | 2·09 | |
| 1431 | **HELGOLAND** . . . | | 54 11 7 54 | STANDARD PORT | | | | See Table V | | | | 1·39 | |
| 1432 | Ausseneider Buoy . . | | 54 14 8 18 | +0029 | +0024 | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ | |
| 1433 | Süderhöft . . . . | | 54 16 8 42 | +0101 | +0052 | +0037 | +0102 | +0·8 | +0·8 | +0·1 | 0·0 | ⊙ | |
| 1435 | Norder Piep Buoy . . | | 54 12 8 28 | +0036 | +0031 | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ | |
| 1436 | Büsum . . . . | G | 54 07 8 51 | +0054 | +0049 | 0000 | +0028 | +1·0 | +0·9 | +0·1 | 0·0 | 1·96 | |
| 1438 | **CUXHAVEN** . . . . (see page 166) | | | **0200 and 1400** | **0800 and 2000** | **0200 and 1400** | **0900 and 2100** | **3·4** | **2·9** | **0·4** | **0·0** | | |
| | *River Elbe* | | | | | | | | | | | | |
| 1437 | Scharhörn . . . . | | 53 58 8 28 | −0045 | −0048 | −0056 | −0057 | −0·1 | −0·1 | +0·1 | 0·0 | ⊙ | |
| 1438 | **CUXHAVEN** . . . | | 53 52 8 43 | STANDARD PORT | | | | See Table V | | | | 1·75 | |
| 1439 | Brunsbüttel . . . | G | 53 53 9 08 | +0057 | +0057 | +0112 | +0113 | −0·3 | −0·2 | −0·2 | 0·0 | 1·41 | |
| 1440 | Glückstadt . . . | | 53 47 9 25 | +0200 | +0204 | +0212 | +0210 | −0·3 | −0·2 | −0·2 | 0·0 | ⊙ | |
| 1441 | Stadersand . . . | | 53 38 9 32 | +0237 | +0240 | +0257 | +0252 | −0·2 | 0·0 | −0·2 | 0·0 | ⊙ | |
| 1442 | Schulau . . . . | | 53 34 9 42 | +0258 | +0310 | +0333 | +0316 | −0·1 | +0·1 | −0·2 | 0·0 | ⊙ | |
| 1443 | Nienstedten . . . | | 53 33 9 51 | +0317 | +0326 | +0400 | +0342 | +0·1 | +0·3 | −0·3 | +0·1 | ⊙ | |
| 1444 | Hamburg . . . . | G | 53 33 9 58 | +0333 | +0342 | +0421 | +0403 | +0·2 | +0·3 | −0·3 | 0·0 | 1·26 | |
| 1445 | Harburg . . . . | | 53 28 10 00 | +0341 | +0347 | +0429 | +0413 | +0·2 | +0·4 | −0·3 | 0·0 | ⊙ | |
| 1446 | Schöpfstelle . . . | | 53 30 10 04 | +0346 | +0353 | +0443 | +0426 | +0·2 | +0·4 | −0·3 | 0·0 | ⊙ | |
| 1447 | Bunthaus . . . . | | 53 27 10 04 | +0356 | +0402 | +0501 | +0444 | −0·1 | +0·1 | −0·3 | 0·0 | ⊙ | |
| 1448 | Zollenspieker . . . | | 53 24 10 11 | +0422 | +0430 | +0555 | +0533 | −0·3 | −0·1 | +0·2 | +0·5 | ⊙ | |

SEASONAL CHANGES IN MEAN LEVEL

| No. | Jan. 1 | Feb. 1 | Mar. 1 | Apr. 1 | May 1 | June 1 | July 1 | Aug. 1 | Sep. 1 | Oct. 1 | Nov. 1 | Dec. 1 | Jan. 1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1257–1276 | +0·1 | 0·0 | 0·0 | −0·1 | −0·1 | −0·1 | 0·0 | 0·0 | 0·0 | 0·0 | 0·0 | +0·1 | +0·1 |
| 1279–1294 | 0·0 | 0·0 | −0·1 | −0·1 | −0·1 | 0·0 | 0·0 | 0·0 | 0·0 | 0·0 | +0·1 | +0·1 | 0·0 |
| 1295–1300 | +0·1 | 0·0 | 0·0 | −0·1 | −0·1 | −0·1 | −0·1 | 0·0 | 0·0 | 0·0 | +0·1 | +0·1 | +0·1 |
| 1386–1409 | | | | | | | Negligible | | | | | | |
| 1412–1437 | +0·1 | +0·1 | 0·0 | 0·0 | 0·0 | 0·0 | −0·1 | −0·1 | −0·1 | 0·0 | 0·0 | +0·1 | +0·1 |
| 1438–1448 | +0·1 | +0·1 | 0·0 | 0·0 | 0·0 | 0·0 | −0·1 | −0·2 | −0·1 | 0·0 | +0·1 | +0·1 | +0·1 |

| No. | PLACE | Lat. N. | Long. E. | TIME DIFFERENCES High Water 0300 and 1500 | High Water 0900 and 2100 | Low Water 0400 and 1600 | Low Water 1000 and 2200 | HEIGHT DIFFERENCES (IN METRES) MHWS 4·7 | MHWN 3·9 | MLWN 0·8 | MLWS 0·3 | M.L. $Z_0$ m. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Zone −0100 | | | | | | | | | |
| 1534 | **VLISSINGEN (FLUSHING)** | (see page 178) | | | | | | | | | | | |
| 1501 | IJmuiden | N 52 28 | 4 36 | +0145 | +0143 | +0304 | +0321 | −2·7 | −2·2 | −0·6 | −0·1 | 0·95 | *c* |
| 1503 | Scheveningen | N 52 06 | 4 16 | +0105 | +0102 | +0226 | +0246 | −2·6 | −2·2 | −0·6 | −0·1 | 0·89 | ★ |
| 1504 | Europlatform | N 52 00 | 3 17 | +0012 | 0000 | −0028 | −0059 | −2·7 | −2·2 | −0·5 | −0·1 | 0·98 | ★ |
| | *Nieuwe Waterweg* | | | | | | | | | | | | |
| 1505 | **HOEK VAN HOLLAND** | 51 59 | 4 07 | STANDARD PORT | | | | See Table V | | | | 0·90 | ★ |
| 1506 | Maassluis | 51 55 | 4 15 | +0201 | +0136 | +0040 | 0000 | −2·8 | −2·2 | −0·6 | 0·0 | 0·89 | ★ |
| | *Nieuwe Maas* | | | | | | | | | | | | |
| 1507 | Vlaardingen | 51 54 | 4 21 | +0157 | +0143 | +0115 | +0035 | −2·7 | −2·2 | −0·6 | 0·0 | 0·88 | ★ |
| 1508 | Rotterdam | N 51 55 | 4 30 | +0202 | +0156 | +0313 | +0400 | −2·7 | −2·2 | −0·6 | −0·1 | 0·83 | ★*c* |
| | *Lek* | | | | | | | | | | | | |
| 1509 | Krimpen | 51 54 | 4 38 | +0246 | +0227 | +0351 | +0438 | −2·9 | −2·3 | −0·4 | +0·1 | 0·88 | ★ |
| 1510 | Streefkerk | 51 55 | 4 45 | +0323 | +0302 | +0431 | +0521 | −3·0 | −2·3 | −0·3 | +0·2 | 0·99 | |
| 1511 | Schoonhoven | 51 57 | 4 51 | +0409 | +0345 | +0517 | +0600 | −2·9 | −2·2 | −0·2 | +0·4 | 1·14 | |
| | *Oude Maas* | | | | | | | | | | | | |
| 1512 | Spijkenisse | 51 52 | 4 20 | +0208 | +0150 | +0258 | +0337 | −2·9 | −2·3 | −0·6 | −0·1 | 0·77 | ★ |
| 1512a | Goidschalxoord | 51 50 | 4 27 | +0244 | +0221 | +0314 | +0410 | −3·2 | −2·6 | −0·5 | +0·1 | 0·73 | |
| 1513 | Puttershoek | 51 48 | 4 35 | +0250 | +0230 | +0400 | +0445 | −3·4 | −2·8 | −0·5 | 0·0 | ⊙ | |
| | *De Noord* | | | | | | | | | | | | |
| 1514 | Alblasserdam | 51 52 | 4 38 | +0235 | +0220 | +0350 | +0450 | −3·1 | −2·6 | −0·4 | +0·1 | ⊙ | |
| | *De Kil* | | | | | | | | | | | | |
| 1515 | 's-Gravendeel | 51 47 | 4 38 | +0231 | +0225 | +0448 | +0529 | −3·8 | −3·0 | −0·5 | +0·1 | 0·58 | |
| | *Merwede* | | | | | | | | | | | | |
| 1517 | Dordrecht | N 51 49 | 4 39 | +0234 | +0229 | +0432 | +0518 | −3·5 | −2·8 | −0·5 | +0·1 | 0·68 | ★ |
| 1518 | Sliedrecht | 51 49 | 4 47 | +0410 | +0355 | +0600 | +0615 | −3·6 | −2·9 | −0·4 | +0·2 | ⊙ | ★ |
| 1519 | Gorinchem | 51 50 | 4 58 | +0445 | +0435 | +0705 | +0725 | −3·7 | −3·1 | −0·3 | +0·3 | ⊙ | ★ |
| 1521 | Haringvlietsluizen | N 51 50 | 4 02 | +0016 | +0014 | +0006 | −0026 | −1·8 | −1·7 | −0·5 | 0·0 | 1·18 | ★ |
| | *Oster Schelde* | | | | | | | | | | | | |
| 1528 | Roompot | 51 37 | 3 40 | +0115 | +0115 | +0115 | +0115 | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ | ★ |
| 1530 | Wemeldinge | 51 31 | 4 00 | +0145 | +0145 | +0125 | +0125 | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ | |
| 1530a | Lodijkse Gat | 51 30 | 4 12 | +0145 | +0145 | +0125 | +0125 | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ | |
| | *Zijpe* | | | | | | | | | | | | |
| 1531 | Philipsdam (West) | 51 40 | 4 11 | +0135 | +0135 | +0125 | +0125 | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ | |
| | *Walcheren* | | | | | | | | | | | | |
| 1533 | Oostkapelle (Oosterhoofd) | 51 36 | 3 34 | +0005 | +0005 | −0005 | −0020 | −1·1 | −0·9 | −0·2 | 0·0 | ⊙ | ★ |
| 1533a | Westkapelle | 51 31 | 3 27 | −0024 | −0014 | −0012 | −0023 | −0·6 | −0·5 | −0·1 | 0·0 | 1·97 | ★ |
| | *Wester Schelde* | | | | | | | | | | | | |
| 1534 | **VLISSINGEN (FLUSHING)** | 51 27 | 3 36 | STANDARD PORT | | | | See Table V | | | | 2·30 | ★ |
| 1534a | Breskens | 51 24 | 3 34 | −0005 | −0005 | −0002 | −0002 | +0·1 | 0·0 | 0·0 | 0·0 | ⊙ | ★ |
| 1536 | Terneuzen | N 51 20 | 3 49 | +0021 | +0022 | +0022 | +0033 | +0·3 | +0·3 | 0·0 | 0·0 | 2·46 | *c* |
| 1537 | Hansweert | N 51 27 | 4 00 | +0114 | +0054 | +0040 | +0100 | +0·5 | +0·6 | 0·0 | −0·1 | 2·58 | *c* |
| 1538 | Bath | 51 24 | 4 12 | +0126 | +0117 | +0117 | +0144 | +0·8 | +0·9 | 0·0 | 0·0 | 2·76 | *c* |

SEASONAL CHANGES IN MEAN LEVEL

| No. | Jan. 1 | Feb. 1 | Mar. 1 | Apr. 1 | May 1 | June 1 | July 1 | Aug. 1 | Sep. 1 | Oct. 1 | Nov. 1 | Dec. 1 | Jan. 1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1431 | +0·1 | +0·1 | 0·0 | 0·0 | 0·0 | 0·0 | −0·1 | −0·1 | −0·1 | 0·0 | 0·0 | +0·1 | +0·1 |
| 1449–1470 | 0·0 | 0·0 | 0·0 | 0·0 | 0·0 | 0·0 | −0·1 | −0·1 | 0·0 | 0·0 | +0·1 | +0·1 | 0·0 |
| 1471–1489 | 0·0 | 0·0 | −0·1 | −0·1 | −0·1 | −0·1 | 0·0 | 0·0 | 0·0 | +0·1 | +0·1 | +0·1 | 0·0 |
| 1501–1521 | 0·0 | 0·0 | 0·0 | −0·1 | −0·1 | −0·1 | 0·0 | 0·0 | 0·0 | +0·1 | +0·1 | +0·1 | 0·0 |
| 1528–1538 | 0·0 | 0·0 | −0·1 | −0·1 | −0·1 | −0·1 | 0·0 | 0·0 | 0·0 | +0·1 | +0·1 | +0·1 | 0·0 |

| No. | PLACE | Lat. N. | Long. E. | TIME DIFFERENCES High Water (Zone −0100) | TIME DIFFERENCES Low Water (Zone −0100) | | | HEIGHT DIFFERENCES (IN METRES) MHWS | MHWN | MLWN | MLWS | M.L. $Z_0$ m. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1539 | **ANTWERP (PROSPERPOLDER)** | (see page 182) | | **0000 and 1200** | **0500 and 1700** | **0000 and 1200** | **0600 and 1800** | **5·8** | **4·8** | **0·8** | **0·3** | 2·86 | |
| | **Belgium** | | | | | | | | | | | | |
| 1539a | Boudewijnsluis | 51 17 | 4 20 | +0013 | +0005 | +0025 | +0020 | 0·0 | +0·1 | 0·0 | 0·0 | 2·81 | *c* |
| 1539b | Royersluis | B 51 14 | 4 24 | +0030 | +0015 | +0045 | +0041 | +0·2 | +0·3 | 0·0 | 0·0 | 2·84 | *c* |
| 1539c | Boom | 51 05 | 4 22 | +0125 | +0110 | +0155 | +0150 | −0·2 | 0·0 | −0·4 | −0·2 | 2·85 | |
| 1539d | Gentbrugge | 51 03 | 3 44 | +0430 | +0415 | +0630 | +0600 | −3·9 | −3·3 | −1·1 | −0·4 | 1·0 | *x* |
| 1534 | **VLISSINGEN (FLUSHING)** | (see page 178) | | **0300 and 1500** | **0900 and 2100** | **0400 and 1600** | **1000 and 2200** | **4·7** | **3·9** | **0·8** | **0·3** | | |
| 1540 | Cadzand (Wielingen Sluis) | 51 23 | 3 23 | −0030 | −0025 | −0020 | −0025 | −0·1 | −0·2 | +0·1 | 0·0 | ⊙ | |
| 1562 | Zeebrugge | BN 51 21 | 3 12 | −0035 | −0015 | −0020 | −0035 | +0·1 | 0·0 | +0·3 | +0·1 | 2·36 | |
| 1564 | Oostende | B 51 14 | 2 55 | −0055 | −0040 | −0030 | −0045 | +0·3 | +0·3 | +0·3 | +0·1 | 2·69 | |
| 1565 | Nieuwpoort | 51 09 | 2 43 | −0110 | −0050 | −0035 | −0045 | +0·6 | +0·4 | +0·4 | +0·1 | 2·37 | |
| 1568 | **DUNKERQUE** | (see page 186) | | **0200 and 1400** | **0800 and 2000** | **0200 and 1400** | **0900 and 2100** | **5·8** | **4·8** | **1·4** | **0·6** | 3·24 | |
| | **France** | | | | | | | | | | | | |
| 1569 | Gravelines | 51 01 | 2 06 | −0010 | −0010 | −0020 | 0000 | +0·2 | +0·1 | −0·1 | −0·1 | 3·19 | |
| 1569a | Sandettie Bank | 51 09 | 1 47 | −0020 | −0025 | −0020 | −0020 | +0·2 | 0·0 | +0·3 | 0·0 | 3·2 | *x* |
| 1570 | **CALAIS** | 50 58 | 1 51 | | STANDARD PORT | | | | See Table V | | | 4·02 | |
| 1571 | Wissant | 50 53 | 1 40 | −0030 | ⊙ | ⊙ | ⊙ | +1·7 | +1·5 | +0·7 | +0·6 | ⊙ | |
| 1572 | **BOULOGNE** | 50 44 | 1 35 | | STANDARD PORT | | | | See Table V | | | 5·01 | |
| 1579 | **DIEPPE** | (see page 198) | | **0100 and 1300** | **0600 and 1800** | **0100 and 1300** | **0700 and 1900** | **9·3** | **7·2** | **2·6** | **0·7** | | |
| 1573 | Le Touquet, Étaples | 50 31 | 1 35 | +0012 | ⊙ | ⊙ | ⊙ | −0·4 | 0·0 | +0·1 | +0·3 | ⊙ | |
| 1574 | Berck | 50 24 | 1 34 | +0008 | ⊙ | ⊙ | ⊙ | −0·1 | +0·1 | +0·2 | +0·3 | ⊙ | |
| | *La Somme* | | | | | | | | | | | | |
| 1575 | Le Hourdel | 50 13 | 1 34 | +0021 | +0026 | ⊙ | ⊙ | +0·7 | +0·7 | +0·1 | +0·4 | ⊙ | |
| 1576 | St. Valéry | 50 11 | 1 37 | +0028 | +0040 | ⊙ | ⊙ | +0·7 | +0·8 | ⊙ | ⊙ | ⊙ | |
| 1577 | Cayeux | 50 11 | 1 29 | +0007 | +0010 | −0008 | +0013 | +0·9 | +0·7 | +0·1 | +0·4 | 5·50 | |
| 1578 | Le Treport | 50 04 | 1 22 | +0001 | +0005 | +0005 | +0011 | +0·1 | +0·2 | −0·2 | 0·0 | 5·02 | |
| 1579 | **DIEPPE** | 49 56 | 1 05 | | STANDARD PORT | | | | See Table V | | | 4·97 | |
| 1580 | St. Valery-en-Caux | 49 52 | 0 42 | −0018 | −0016 | −0007 | −0013 | −0·5 | −0·1 | −0·2 | +0·3 | 4·88 | |
| 1581 | Fecamp | F 49 46 | 0 22 | −0022 | −0018 | −0034 | −0043 | −0·9 | −0·4 | +0·3 | +0·5 | 4·85 | |
| 1582 | **LE HAVRE** | (see page 202) | | **0000 and 1200** | **0500 and 1700** | **0000 and 1200** | **0700 and 1900** | **7·9** | **6·6** | **3·0** | **1·2** | 4·87 | |
| 1582a | Antifer (Le Havre) | 49 39 | 0 09 | +0022 | +0015 | +0007 | −0011 | +0·1 | 0·0 | 0·0 | 0·0 | 4·73 | |
| | *La Seine* | | | | | | | | | | | | |
| 1583 | Honfleur | 49 25 | 0 14 | −0140 | −0135 | +0005 | +0040 | −0·1 | −0·2 | −0·1 | +0·2 | ⊙ | ★ |
| 1584 | Tancarville | 49 28 | 0 28 | −0105 | −0100 | +0105 | +0140 | −0·1 | −0·1 | −0·2 | +1·0 | ⊙ | ★ |
| 1585 | Quillebeuf | 49 28 | 0 32 | −0045 | −0050 | +0120 | +0200 | 0·0 | 0·0 | 0·0 | +1·4 | ⊙ | ★ |
| 1586 | Vatteville | 49 29 | 0 40 | +0005 | −0020 | +0225 | +0250 | 0·0 | −0·1 | +0·6 | +2·3 | ⊙ | ★ |
| 1587 | Caudebec | 49 32 | 0 44 | +0020 | −0015 | +0230 | +0300 | −0·3 | −0·2 | +0·7 | +2·4 | ⊙ | ★ |
| 1587a | Heurteauville | 49 27 | 0 49 | +0110 | +0030 | +0310 | +0330 | −0·5 | −0·2 | +0·9 | +2·7 | ⊙ | ★ |
| 1588 | Duclair | 49 29 | 0 53 | +0225 | +0150 | +0355 | +0410 | −0·4 | −0·3 | +1·2 | +3·3 | ⊙ | ★ |
| 1589 | Rouen | 49 27 | 1 06 | +0440 | +0415 | +0525 | +0525 | −0·2 | −0·1 | +1·4 | +3·6 | ⊙ | |
| 1590 | Trouville | 49 22 | 0 05 | −0035 | −0015 | 0000 | −0010 | −0·2 | −0·2 | −0·2 | −0·1 | 4·50 | |
| | | **N.** | **W.** | | | | | | | | | | |
| 1591 | Dives | 49 18 | 0 06 | −0055 | ⊙ | ⊙ | −0115 | −0·5 | −0·5 | −0·6 | −0·4 | ⊙ | |
| 1592 | Ouistreham | 49 17 | 0 15 | −0020 | −0010 | −0005 | −0010 | −0·3 | −0·3 | −0·3 | −0·2 | 4·44 | |
| 1593 | Courseulles | 49 20 | 0 27 | −0030 | ⊙ | ⊙ | −0020 | −0·9 | −1·0 | −0·7 | −0·4 | 3·95 | |
| 1594 | Port-en-Bessin | 49 21 | 0 45 | −0045 | −0040 | −0040 | −0045 | −0·7 | −0·7 | −0·4 | −0·1 | 4·22 | |

⊙ No data.
★ See notes on page 344.
**B** Tides predicted in Belgian Tide Tables.
**F** Tides predicted in French Tide Tables.
**N** Tides predicted in Netherlands Tide Tables.
*x* M.L. inferred.

| No. | PLACE | Lat. N. | Long. W. | TIME DIFFERENCES High Water | TIME DIFFERENCES Low Water | HEIGHT DIFFERENCES (IN METRES) MHWS | MHWN | MLWN | MLWS | M.L. $Z_0$ m. | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Zone −0100 | | | | | | | |
| 1600 | **CHERBOURG** (see page 206) | | | **0300 and 1500** | **1000 and 2200** | **0400 and 1600** | **1000 and 2200** | **6·3** | **5·0** | **2·5** | **1·1** | | |
| 1596 | Rade de la Capelle | 49 | 25 1 05 | +0110 | +0055 | +0125 | +0115 | +0·9 | +0·9 | +0·2 | +0·2 | 4·27 | |
| 1598 | St. Vaast | 49 | 35 1 16 | +0105 | +0055 | +0120 | +0100 | +0·3 | +0·4 | −0·2 | −0·2 | 3·80 | |
| 1599 | Barfleur | 49 | 40 1 15 | +0100 | +0100 | +0050 | +0040 | +0·3 | +0·3 | +0·1 | +0·1 | 3·94 | |
| 1600 | **CHERBOURG** | 49 | 39 1 38 | | STANDARD PORT | | | | See Table V | | | 3·78 | |
| 1601 | Omonville | 49 | 43 1 50 | −0015 | −0010 | −0020 | −0025 | −0·1 | 0·0 | +0·1 | 0·0 | 3·76 | |
| 1602 | Goury | 49 | 43 1 56 | −0100 | −0045 | −0110 | −0120 | +1·7 | +1·6 | +1·0 | +0·1 | 4·84 | |
| 1605 | **ST. HELIER** (see page 210) | | | **0300 and 1500** | **0900 and 2100** | **0200 and 1400** | **0900 and 2100** | **11·1** | **8·1** | **4·1** | **1·3** | | |
| | **Channel Islands** | | | **Zone U.T.(G.M.T.)** | | | | | | | | | |
| | *Alderney* | | | | | | | | | | | | |
| 1603 | Braye | 49 | 43 2 12 | +0050 | +0040 | +0025 | +0105 | −4·8 | −3·4 | −1·5 | −0·5 | 3·62 | |
| | *Sark* | | | | | | | | | | | | |
| 1603a | Maseline Pier | 49 | 26 2 21 | +0005 | +0015 | +0005 | +0010 | −2·1 | −1·5 | −0·6 | −0·3 | 4·87 | |
| | *Guernsey* | | | | | | | | | | | | |
| 1604 | St. Peter Port | 49 | 27 2 31 | 0000 | +0012 | −0008 | +0002 | −1·8 | −1·1 | −0·5 | +0·2 | 5·29 | |
| | *Jersey* | | | | | | | | | | | | |
| 1605 | **ST. HELIER** | 49 | 11 2 07 | | STANDARD PORT | | | | See Table V | | | 6·06 | |
| 1606 | St. Catherine Bay | 49 | 13 2 01 | 0000 | +0010 | +0010 | +0010 | 0·0 | −0·1 | 0·0 | +0·1 | 6·0 | x |
| 1606a | Bouley Bay | 49 | 14 2 05 | +0002 | +0002 | +0004 | +0004 | −0·3 | −0·3 | −0·1 | −0·1 | 5·76 | |
| 1607 | Les Ecrehou | 49 | 17 1 56 | +0004 | +0012 | +0010 | +0020 | −0·2 | +0·3 | −0·3 | 0·0 | 6·12 | |
| 1608 | Les Minquiers | 48 | 58 2 08 | +0007 | 0000 | −0008 | +0013 | +0·5 | +0·8 | −0·1 | +0·1 | 6·48 | |
| 1614 | **ST. MALO** (see page 214) | | | **0100 and 1300** | **0800 and 2000** | **0300 and 1500** | **0800 and 2000** | **12·2** | **9·2** | **4·4** | **1·5** | | |
| | **France** | | | **Zone −0100** | | | | | | | | | |
| 1609 | Iles Chausey | 48 | 52 1 49 | +0010 | +0010 | +0015 | +0010 | +0·8 | +0·7 | +0·5 | +0·5 | 7·50 | |
| 1610 | Dielette | 49 | 33 1 52 | +0040 | +0035 | +0010 | +0030 | −2·5 | −1·8 | −0·8 | −0·2 | 5·51 | |
| 1611 | Carteret | 49 | 22 1 47 | +0025 | +0025 | +0020 | +0025 | −1·0 | −0·7 | −0·4 | 0·0 | 6·30 | |
| 1611a | Le Sénéquet | 49 | 05 1 40 | +0015 | +0020 | +0025 | +0025 | −0·3 | −0·2 | −0·1 | −0·1 | 6·69 | |
| 1612 | Granville | 48 | 50 1 36 | +0005 | +0005 | +0010 | +0005 | +0·8 | +0·6 | +0·2 | −0·1 | 7·21 | |
| 1613 | Cancale | 48 | 40 1 51 | 0000 | +0005 | +0010 | +0010 | +1·3 | +1·1 | +0·7 | +0·6 | 7·76 | |
| 1614 | **ST. MALO** | 48 | 38 2 02 | | STANDARD PORT | | | | See Table V | | | 6·85 | |
| 1614a | St. Cast | 48 | 38 2 15 | 0000 | 0000 | −0020 | −0005 | −0·1 | −0·1 | 0·0 | 0·0 | 6·82 | |
| 1615 | Erquy | 48 | 38 2 28 | −0005 | −0005 | −0030 | −0015 | −0·8 | −0·5 | −0·4 | −0·1 | 6·40 | |
| 1616 | Dahouet | 48 | 35 2 34 | −0005 | −0005 | −0035 | −0010 | −0·9 | −0·5 | −0·5 | −0·2 | 6·28 | |
| 1617 | Le Légué | 48 | 32 2 44 | −0005 | 0000 | −0030 | −0020 | −0·8 | −0·5 | −0·3 | −0·1 | 6·3 | x |
| 1618 | Binic | 48 | 36 2 49 | −0005 | 0000 | −0030 | −0020 | −0·8 | −0·5 | −0·3 | −0·1 | 6.31 | |
| 1619 | Portrieux | 48 | 38 2 49 | −0005 | −0005 | −0030 | −0020 | −0·8 | −0·6 | −0·3 | −0·1 | 6·38 | |
| 1620 | Paimpol | 48 | 47 3 02 | −0010 | −0005 | −0035 | −0035 | −1·3 | −0·9 | −0·5 | −0·1 | 6·18 | |
| 1621 | Ile de Bréhat | 48 | 51 3 00 | −0015 | −0005 | −0050 | −0045 | −1·7 | −1·2 | −0·7 | −0·3 | 5·86 | |
| 1622 | Les Heaux de Brehát | F 48 | 55 3 05 | −0005 | −0015 | −0115 | −0020 | −2·3 | −1·6 | −1·0 | −0·4 | 5·51 | |
| 1623 | Lezardrieux | 48 | 47 3 06 | −0010 | −0010 | −0050 | −0030 | −1·7 | −1·2 | −0·6 | −0·2 | 5·89 | |
| 1624 | Plougrescant | 48 | 51 3 13 | −0040 | −0040 | −0120 | −0055 | −2·5 | −1·7 | −0·9 | −0·1 | 5·55 | |
| 1625 | Tréguier | 48 | 47 3 13 | −0035 | −0035 | −0130 | −0050 | −2·4 | −1·7 | −1·1 | −0·4 | 5·46 | |
| 1625a | Perros-Guirec | 48 | 49 3 26 | −0035 | −0045 | −0125 | −0105 | −2·8 | −1·9 | −0·9 | −0·2 | 5·39 | |
| 1626 | Ploumanac'h | 48 | 50 3 29 | −0035 | −0040 | −0130 | −0105 | −3·2 | −2·1 | −1·0 | −0·4 | 5·15 | |

SEASONAL CHANGES IN MEAN LEVEL

| No. | Jan. 1 | Feb. 1 | Mar. 1 | Apr. 1 | May 1 | June 1 | July 1 | Aug. 1 | Sep. 1 | Oct. 1 | Nov. 1 | Dec. 1 | Jan. 1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1534–1571 | 0·0 | 0·0 | −0·1 | −0·1 | −0·1 | −0·1 | 0·0 | 0·0 | 0·0 | +0·1 | +0·1 | +0·1 | 0·0 |
| 1572–1581a | 0·0 | −0·1 | −0·1 | −0·1 | 0·0 | 0·0 | 0·0 | 0·0 | +0·1 | +0·1 | 0·0 | 0·0 | 0·0 |
| 1582–1602 | 0·0 | 0·0 | −0·1 | −0·1 | −0·1 | 0·0 | 0·0 | 0·0 | 0·0 | +0·1 | +0·1 | +0·1 | 0·0 |
| 1603–1626 | Negligible | | | | | | | | | | | | |

| No. | PLACE | Lat. N. | Long. W. | TIME DIFFERENCES High Water | TIME DIFFERENCES Low Water | | | HEIGHT DIFFERENCES (IN METRES) MHWS | MHWN | MLWN | MLWS | M.L. $Z_0$ m. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Zone U.T.(G.M.T.) | | | | | | | | | |
| 1741 | **LISBON** | (see page 226) | | **0400 and 1600** | **0900 and 2100** | **0400 and 1600** | **0900 and 2100** | **3·8** | **3·0** | **1·4** | **0·5** | | |
| | **Portugal** | | | | | | | | | | | | |
| 1730 | Viana do Castelo | P 41 41 | 8 50 | −0020 | 0000 | +0010 | +0015 | −0·3 | −0·3 | 0·0 | 0·0 | 2·00 | |
| 1731 | Esposende | 41 32 | 8 47 | −0020 | 0000 | +0010 | +0015 | −0·6 | −0·5 | −0·1 | 0·0 | ⊙ | |
| 1732 | Povoa de Varzim | 41 22 | 8 46 | −0020 | 0000 | +0010 | +0015 | −0·3 | −0·3 | 0·0 | 0·0 | ⊙ | |
| 1733 | Porto de Leixoes | P 41 11 | 8 42 | −0025 | −0010 | 0000 | +0010 | −0·3 | −0·3 | −0·1 | 0·0 | 2·00 | |
| | *Rio Douro* | | | | | | | | | | | | |
| 1734 | Entrance | 41 09 | 8 40 | −0010 | +0005 | +0015 | +0025 | −0·6 | −0·5 | −0·1 | 0·0 | 1·96 | |
| 1735 | Oporto (Porto) | 41 08 | 8 37 | +0002 | +0002 | +0040 | +0040 | −0·5 | −0·4 | −0·1 | +0·1 | 1·96 | |
| 1736 | Barra de Aveiro | P 40 39 | 8 45 | +0005 | +0010 | +0010 | +0015 | −0·6 | −0·4 | 0·0 | +0·2 | 2·00 | |
| 1737 | Figueira da Foz | P 40 09 | 8 51 | −0015 | 0000 | +0010 | +0020 | −0·3 | −0·3 | −0·1 | 0·0 | 2·00 | |
| 1738 | Enseada da Nazare (Pederneira) | 39 36 | 9 05 | −0030 | −0015 | −0005 | +0005 | −0·5 | −0·4 | 0·0 | +0·2 | 2·00 | |
| 1739 | Peniche | P 39 21 | 9 22 | −0035 | −0015 | −0005 | 0000 | −0·3 | −0·3 | −0·1 | 0·0 | 2·00 | |
| 1739a | Ericeira | 38 58 | 9 25 | −0040 | −0025 | −0010 | −0010 | −0·4 | −0·3 | −0·1 | +0·1 | 2·00 | |
| | *River Tagus (Rio Tejo)* | | | | | | | | | | | | |
| 1740 | Cascais | P 38 42 | 9 25 | −0040 | −0025 | −0015 | −0010 | −0·3 | −0·3 | +0·1 | +0·2 | 2·08 | |
| 1741 | **LISBON** | 38 42 | 9 08 | STANDARD PORT | | | | | See Table V | | | 2·20 | |
| 1743 | Sesimbra | P 38 26 | 9 07 | −0045 | −0030 | −0020 | −0010 | −0·4 | −0·4 | 0·0 | +0·1 | 2·00 | |
| 1744 | Setubal | P 38 30 | 8 54 | −0020 | −0015 | −0005 | +0005 | −0·4 | −0·3 | −0·1 | 0·0 | 2·00 | |
| 1745 | Porto de Sines | P 37 57 | 8 53 | −0050 | −0030 | −0020 | −0010 | −0·4 | −0·4 | 0·0 | +0·1 | 2·00 | |
| 1746 | Milfontes | 37 43 | 8 47 | −0040 | −0030 | ⊙ | ⊙ | −0·1 | −0·1 | +0·1 | +0·2 | ⊙ | |
| 1747 | Arrifana | 37 17 | 8 52 | −0030 | −0020 | ⊙ | ⊙ | −0·1 | 0·0 | 0·0 | +0·2 | ⊙ | |
| 1748 | Enseada de Belixe | 37 01 | 8 58 | −0050 | −0030 | −0020 | −0015 | +0·3 | +0·2 | +0·3 | +0·3 | ⊙ | |
| 1749 | Lagos | P 37 06 | 8 40 | −0100 | −0040 | −0030 | −0025 | −0·4 | −0·4 | 0·0 | +0·1 | 2·00 | |
| 1750 | Ponta do Altar | 37 06 | 8 31 | −0100 | −0040 | −0030 | −0025 | −0·3 | −0·3 | 0·0 | +0·1 | ⊙ | |
| 1751 | Enseada de Albufeira | 37 05 | 8 15 | −0035 | +0015 | −0005 | 0000 | −0·2 | −0·2 | +0·1 | +0·2 | ⊙ | |
| 1752 | Cabo de Santa Maria | P 36 58 | 7 52 | −0050 | −0030 | −0015 | +0005 | −0·4 | −0·4 | 0·0 | +0·1 | 2·00 | |
| | *Rio Guadiana* | | | | | | | | | | | | |
| 1753 | Vila Real de Santo António | P 37 11 | 7 25 | −0050 | −0015 | −0010 | 0000 | −0·4 | −0·3 | 0·0 | +0·2 | 2·00 | |
| 1741 | **LISBON** | (see page 226) | | **0500 and 1700** | **1000 and 2200** | **0500 and 1700** | **1100 and 2300** | **3·8** | **3·0** | **1·4** | **0·5** | | |
| | **Spain** | | | **Zone −0100** | | | | | | | | | |
| 1753a | Ayamonte | S 37 13 | 7 25 | +0005 | +0015 | +0025 | +0045 | −0·7 | −0·6 | 0·0 | −0·1 | 1·75 | |
| | *Ria de Huelva* | | | | | | | | | | | | |
| 1754 | Bar | S 37 08 | 6 52 | 0000 | +0015 | +0035 | +0030 | −0·6 | −0·5 | −0·2 | −0·1 | 1·85 | |
| 1755 | Huelva, Muelle de Fabrica | 37 15 | 6 58 | +0010 | +0025 | +0045 | +0040 | −0·3 | −0·3 | −0·2 | 0.0 | ⊙ | |
| | *Rio Guadalquivir* | | | | | | | | | | | | |
| 1756 | Bar | S 36 46 | 6 26 | −0005 | +0005 | +0020 | +0030 | −0·6 | −0·5 | −0·1 | −0·1 | 1·88 | |
| 1757 | Bonanza | S 36 48 | 6 20 | +0025 | +0040 | +0100 | +0120 | −0·8 | −0·6 | −0·3 | 0·0 | 1·74 | *c* |
| 1758 | Corta de los Jerónimos | S 37 08 | 6 06 | +0210 | +0230 | +0255 | +0345 | −1·2 | −0·9 | −0·4 | 0·0 | 1·55 | *c* |
| 1759 | Sevilla | S 37 20 | 6 00 | +0400 | +0430 | +0510 | +0545 | −1·7 | −1·2 | −0·5 | 0·0 | 1·32 | *c* |
| 1760 | Rota | S 36 37 | 6 21 | −0010 | +0010 | +0025 | +0015 | −0·7 | −0·6 | −0·3 | −0·1 | 1·76 | |
| | *Cadiz* | | | | | | | | | | | | |
| 1763 | Puerto | S 36 32 | 6 17 | 0000 | +0020 | +0040 | +0025 | −0·5 | −0·5 | −0·2 | 0·0 | 1·87 | |
| 1764 | La Carraca | S 36 30 | 6 11 | +0020 | +0050 | +0100 | +0040 | −0·5 | −0·4 | −0·1 | 0·0 | 1·92 | |
| 1765 | Cabo Trafalgar | 36 10 | 5 18 | −0003 | −0003 | +0026 | +0026 | −1·4 | −1·1 | −0·5 | −0·1 | 1·4 | *x* |
| 1765a | Rio Barbate | 36 11 | 5 55 | +0016 | +0016 | +0045 | +0045 | −1·9 | −1·5 | −0·4 | +0·1 | 1·26 | |
| 1766 | Punta Camarinal | 36 05 | 5 48 | −0007 | −0007 | +0013 | +0013 | −1·7 | −1·4 | −0·6 | −0·2 | 1·2 | *x* |

SEASONAL CHANGES IN MEAN LEVEL

| No. | Jan. 1 | Feb. 1 | Mar. 1 | Apr. 1 | May 1 | June 1 | July 1 | Aug. 1 | Sep. 1 | Oct. 1 | Nov. 1 | Dec. 1 | Jan. 1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1681<br>1690–1698 | 0·0 | −0·1 | −0·1 | −0·1 | 0·0 | 0·0 | Negligible<br>0·0 | 0·0 | 0·0 | +0·1 | +0·1 | 0·0 | 0·0 |
| 1699–1719<br>1720–1766 | | | | | | | Negligible | | | | | | |

| No. | PLACE | Lat. N. | Long. E. | TIME DIFFERENCES High Water | TIME DIFFERENCES Low Water | HEIGHT DIFFERENCES (IN METRES) MHWS | MHWN | MLWN | MLWS | M.L. $Z_0$ m. | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Zone −0100 | | | | | | | |
| 1770 | **GIBRALTAR** (see page 230) | — | — | — | — | 1·0 | 0·7 | 0·3 | 0·1 | | |
| 1835 | La Skhirra | 34 17 | 10 05 | +0055 | +0055 | +0210 | +0210 | +1·1 | +0·7 | +0·7 | +0·4 | 1·25 | |
| 1836 | Gabès | 33 53 | 10 07 | +0055 | +0055 | +0125 | +0125 | +1·1 | +0·6 | +0·7 | +0·2 | 1·19 | |
| 1837 | Bou Grara | 33 32 | 10 41 | +0420 | +0420 | +0545 | +0545 | −0·2 | −0·2 | +0·2 | +0·2 | 0·36 | |
| 1838 | Houmt Adjim | 33 43 | 10 45 | +0130 | +0130 | +0230 | +0230 | +0·2 | 0·0 | +0·2 | 0·0 | 0·64 | |
| 1839 | Adjim Bar | 33 44 | 10 40 | +0120 | +0120 | +0245 | +0245 | +1·1 | +0·7 | +0·7 | +0·4 | ⊙ | |
| 1840 | Houmt Souk | 33 53 | 10 52 | +0120 | +0120 | +0240 | +0240 | +0·7 | +0·5 | +0·7 | +0·6 | 1.14 | |
| 1841 | Ras Tourg-en-Ness | 33 49 | 11 03 | +0105 | +0105 | +0115 | +0115 | +0·4 | +0·3 | +0·5 | +0·4 | 0·99 | |
| 1842 | Zarzis | 33 30 | 11 07 | +0100 | +0100 | +0120 | +0120 | 0·0 | 0·0 | +0·2 | +0·1 | 0·63 | |
| 1843 | Ras el Ketef | 33 11 | 11 30 | −0035 | −0035 | +0040 | +0040 | 0·0 | −0·1 | +0·3 | +0·2 | 0·52 | |
| | **Italy** | | | | | | | | | | |
| | *Gulf of Genoa* | | | | | | | | | | |
| 1850 | Imperia | I 43 53 | 8 01 | +0550 | +0550 | +0640 | +0640 | −0·7 | −0·5 | −0·2 | −0·1 | 0·15 | |
| 1851 | Genova (Genoa) | I 44 24 | 8 54 | +0525 | +0525 | +0610 | +0610 | −0·7 | −0·5 | −0·2 | −0·1 | 0·15 | |
| 1851a | La Spezia | I 44 04 | 9 51 | +0520 | +0520 | +0545 | +0545 | −0·7 | −0·4 | −0·2 | 0·0 | 0·20 | |
| 1852 | Livorno (Leghorn) | I 43 33 | 10 18 | +0550 | +0550 | +0620 | +0620 | −0·7 | −0·5 | −0·2 | 0·0 | 0·17 | |
| 1853 | Civitavecchia | I 42 06 | 11 47 | +0615 | +0615 | +0625 | +0625 | −0·6 | −0·4 | −0·2 | 0·0 | 0·20 | |
| 1854 | Gaeta | 41 13 | 13 35 | +0620 | +0620 | +0630 | +0630 | −0·7 | −0·5 | −0·2 | −0·1 | 0·15 | |
| 1855 | Napoli (Naples) | I 40 50 | 14 16 | +0630 | +0630 | +0640 | +0640 | −0·6 | −0·4 | −0·2 | 0·0 | 0·20 | |
| 1856 | Ischia | 40 44 | 13 56 | +0615 | +0615 | +0630 | +0630 | −0·7 | −0·5 | −0·2 | −0·1 | 0·16 | |
| 1857 | Tropea | 38 41 | 15 54 | +0630 | +0630 | +0600 | +0600 | −0·6 | −0·4 | −0·2 | −0·1 | 0·20 | |
| | *Strait of Messina* | | | | | | | | | | |
| 1860 | Villa San Giovanni | 38 13 | 15 38 | +0120 | +0120 | +0120 | +0120 | −0·8 | −0·5 | −0·2 | 0·0 | 0·12 | |
| 1861 | Reggio Calabria | 38 07 | 15 39 | +0020 | +0020 | +0040 | +0040 | −0·8 | −0·5 | −0·2 | −0·1 | 0·12 | |
| 1862 | Taormina | 37 51 | 15 17 | +0010 | +0010 | +0030 | +0030 | −0·7 | −0·5 | −0·2 | −0·1 | 0·12 | |
| 1863 | Messina | I 38 12 | 15 34 | −0230 | −0230 | −0050 | −0050 | −0·8 | −0·5 | −0·2 | −0·1 | 0·12 | |
| 1864 | Capo Peloro | 38 16 | 15 39 | +0620 | +0620 | +0650 | +0650 | −0·7 | −0·5 | −0·1 | 0·0 | 0·20 | |
| | *Lipari Islands* | | | | | | | | | | |
| 1865 | Lipari | 38 28 | 14 57 | +0620 | +0620 | +0640 | +0640 | −0·6 | −0·4 | −0·2 | −0·1 | 0·20 | |
| | *Sicily* | | | | | | | | | | |
| 1866 | Milazzo | 38 13 | 15 15 | +0630 | +0630 | +0610 | +0610 | −0·6 | −0·4 | −0·2 | −0·1 | 0·20 | |
| 1867 | Palermo | I 38 08 | 13 20 | +0615 | +0615 | +0630 | +0630 | −0·6 | −0·4 | −0·2 | −0·1 | 0·21 | |
| 1868 | Marsala | 37 47 | 12 26 | +0615 | +0615 | +0640 | +0640 | −0·7 | −0·5 | −0·2 | 0·0 | 0·15 | * |
| 1869 | Mazara del Vallo | 37 39 | 12 35 | +0240 | +0240 | +0230 | +0230 | −0·8 | −0·5 | −0·2 | 0·0 | 0·15 | * |
| 1870 | Porto Empedocle | I 37 17 | 13 32 | +0050 | +0050 | +0100 | +0100 | −0·8 | −0·5 | −0·2 | 0·0 | 0·15 | * |
| 1871 | Catania | 37 29 | 15 06 | +0025 | +0025 | +0050 | +0050 | −0·8 | −0·5 | −0·2 | −0·1 | 0·12 | * |
| | **Malta** | | | | | | | | | | |
| 1880 | Valletta | 35 53 | 14 31 | +0050 | +0050 | +0025 | +0025 | −0·6 | −0·4 | 0·0 | +0·1 | 0·30 | * |
| | **Italy** | | | | | | | | | | |
| | *Golfo di Taranto* | | | | | | | | | | |
| 1885 | Taranto | 40 28 | 17 13 | +0045 | +0045 | +0045 | +0045 | −0·7 | −0·5 | −0·1 | 0·0 | 0·2 | x |
| 1885a | Otranto | 40 09 | 18 30 | +0050 | +0050 | +0050 | +0050 | −0·7 | −0·5 | −0·1 | 0·0 | 0·2 | x |
| 1894 | **VENEZIA (Venice)** (see page 234) | — | — | — | — | 0·9 | 0·6 | 0·4 | 0·1 | | |
| | *Adriatic* | | | | | | | | | | |
| 1886 | Brindisi | I 40 39 | 17 58 | +0500 | +0500 | +0500 | +0500 | −0·6 | −0·4 | −0·3 | −0·1 | 0·15 | |
| 1887 | Vieste | 41 53 | 16 11 | +0440 | +0440 | +0440 | +0440 | −0·6 | −0·4 | −0·2 | 0·0 | 0·20 | |
| 1888 | Ortona | 42 21 | 14 25 | *p* | *p* | *p* | *p* | −0·5 | −0·3 | −0·1 | +0·1 | 0·3 | x* |
| 1889 | Ancona | I 43 37 | 13 30 | *p* | *p* | *p* | *p* | −0·5 | −0·3 | −0·1 | +0·1 | 0·30 | * |
| 1890 | Pesaro | 43 55 | 12 55 | *p* | *p* | *p* | *p* | −0·3 | −0·2 | −0·1 | +0·1 | 0·37 | * |
| 1890a | Porto Corsini | I 44 30 | 12 17 | −0020 | −0020 | −0025 | −0025 | −0·3 | −0·1 | 0·0 | 0·0 | 0·40 | |
| 1891 | Chioggia | 45 13 | 12 16 | −0025 | −0025 | −0025 | −0025 | 0·0 | 0·0 | 0·0 | 0·0 | 0·52 | |
| 1892 | Malamocco | 45 20 | 12 21 | −0040 | −0040 | −0040 | −0040 | 0·0 | 0·0 | 0·0 | 0·0 | 0·52 | |
| 1894 | **VENEZIA** | 45 26 | 12 20 | STANDARD PORT | | | | See Table V | | | 0·52 | | |
| 1894a | Porto Marghera | 45 28 | 12 15 | +0025 | +0025 | ⊙ | ⊙ | 0·0 | 0·0 | 0·0 | 0·0 | 0·52 | |
| 1895 | Grado | 45 41 | 13 23 | −0020 | −0020 | −0020 | −0020 | 0·0 | 0·0 | 0·0 | 0·0 | 0·52 | |
| 1896 | Trieste | I 45 39 | 13 46 | −0115 | −0115 | −0115 | −0115 | 0·0 | 0·0 | 0·0 | 0·0 | 0·52 | |

SEASONAL CHANGES IN MEAN LEVEL

| No. | Jan. 1 | Feb. 1 | Mar. 1 | Apr. 1 | May 1 | June 1 | July 1 | Aug. 1 | Sep. 1 | Oct. 1 | Nov. 1 | Dec. 1 | Jan. 1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1768–1896 | Negligible | | | | | | | | | | | | |

| No. | PLACE | Lat. N. | Long. E. | TIME DIFFERENCES High Water | TIME DIFFERENCES Low Water | | | HEIGHT DIFFERENCES (IN METRES) MHWS | MHWN | MLWN | MLWS | M.L. $Z_0$ m. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Zone −0200 | | | | | | | | | |
| 1770 | **GIBRALTAR** . . . | (see page 230) | | **0800 and 2000** | **1100 and 2300** | **0100 and 1300** | **0500 and 1700** | **1·0** | **0·7** | **0·3** | **0·1** | | |
| | **Lebanon** | | | | | | | | | | | | |
| 1987 | Tripoli . . . . | 34 | 27 35 49 | −0442 | −0442 | ⊙ | ⊙ | −0·4 | −0·3 | 0·0 | 0·0 | ⊙ | |
| 1988 | Beirut . . . . | 33 | 54 35 30 | −0456 | −0456 | ⊙ | ⊙ | −0·6 | −0·4 | −0·1 | 0·0 | ⊙ | |
| 1988a | Sidon . . . . | 33 | 34 35 22 | −0450 | −0450 | −0400 | −0400 | −0·4 | −0·2 | 0·0 | +0·1 | ⊙ | |
| | **Israel** | | | | | | | | | | | | |
| 1989 | Hefa . . . . | 32 | 49 35 00 | −0505 | −0505 | ⊙ | ⊙ | −0·4 | −0·3 | −0·2 | −0·1 | 0·3 | x |
| 1990 | Ashdod . . . . | 31 | 50 34 38 | −0505 | −0505 | ⊙ | ⊙ | −0·4 | −0·3 | −0·2 | −0·1 | 0·3 | x |
| | **Egypt** | | | | | | | | | | | | |
| 1991 | Port Said . . . . | 31 | 16 32 19 | −0630 | −0410 | −0520 | −0410 | −0·3 | −0·2 | +0·2 | +0·2 | 0·45 | |
| 1992 | El Iskandariya (Alexandria) | 31 | 10 29 51 | −0435 | −0435 | −0440 | −0440 | −0·5 | −0·4 | −0·2 | −0·1 | 0·3 | x |
| 1993 | Salum . . . . | 31 | 34 25 10 | −0449 | −0449 | ⊙ | ⊙ | −0·8 | −0·5 | −0·1 | 0·0 | ⊙ | |
| | **Libya** | | | | | | | | | | | | |
| 1994 | Bardia . . . . | 31 | 46 25 10 | −0510 | −0510 | −0450 | −0450 | −0·8 | −0·6 | −0·2 | 0·0 | 0·10 | |
| 1995 | Mersa Tobruk . . . | 32 | 05 23 58 | ⊙ | ⊙ | ⊙ | ⊙ | Tide hardly appreciable | | | | 0·1 | x |
| 1996 | Mersa el Brega . . . | 30 | 25 19 35 | +0110 | +0110 | +0135 | +0135 | −0·6 | −0·3 | 0·0 | +0·1 | 0·34 | |
| 1997 | Misurata . . . . | 32 | 22 15 13 | +0100 | +0100 | +0130 | +0130 | −0·5 | −0·3 | 0·0 | +0·2 | 0·37 | |
| 1998 | Tarabulus (Tripoli) . . | 32 | 54 13 11 | +0124 | +0124 | +0154 | +0154 | −0·5 | −0·4 | −0·1 | 0·0 | 0·3 | ★x |

SEASONAL CHANGES IN MEAN LEVEL

| No. | Jan. 1 | Feb. 1 | Mar. 1 | Apr. 1 | May 1 | June 1 | July 1 | Aug. 1 | Sep. 1 | Oct. 1 | Nov. 1 | Dec. 1 | Jan. 1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1770–1981 | | | | | | | Negligible | | | | | | |
| 1983–1991 | 0·0 | −0·1 | −0·1 | −0·1 | 0·0 | 0·0 | 0·0 | +0·1 | +0·1 | +0·1 | 0·0 | 0·0 | 0·0 |
| 1992–1998 | | | | | | | Negligible | | | | | | |

# PART III

## HARMONIC CONSTANTS

These data are intended for use with the Simplified Harmonic Method of Tidal Prediction. This may be carried out either manually using Form N.P. 159, or by calculator or computer using N.P. 159a (the PC version of N.P. 159) or other program based on N.P. 159 or Forms A and B at the back of this book as described on pages xxvi to xxvii.

Whichever method is used the results will not be exactly the same as those in Part I, which use many more harmonic constituents—sometimes in excess of 100—and thus can be expected to be of greater accuracy.

Except where indicated to the contrary, harmonic constant values are based on observations lasting for at least one month.

| No. | PLACE | M.L. $Z_0$ | HARMONIC CONSTANTS $M_2$ | | $S_2$ | | Zone U.T.(G.M.T.) $K_1$ | | $O_1$ | | S.W. CORRECTIONS ¼-diurnal | | ⅛-diurnal | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | m. | g° | H.m. | g° | H.m. | g° | H.m. | g° | H.m. | $f_4$ | $F_4$ | $f_6$ | $F_6$ | |
| 1 | St. Mary's | 3·13 | 130 | 1·76 | 171 | 0·61 | 100 | 0·05 | 341 | 0·05 | 288 | 0·020 | ⊙ | ⊙ | |
| 2 | Penzance (Newlyn) | 3·08 | 135 | 1·72 | 179 | 0·58 | 112 | 0·06 | 341 | 0·05 | 261 | 0·036 | ⊙ | ⊙ | |
| 2a | Porthleven | 3·08 | 135 | 1·65 | 185 | 0·52 | 109 | 0·07 | 356 | 0·05 | 263 | 0·038 | ⊙ | ⊙ | |
| 3 | Lizard Point | 2·99 | 137 | 1·62 | 186 | 0·55 | 115 | 0·06 | 324 | 0·06 | 239 | 0·035 | ⊙ | ⊙ | |
| 4 | Coverack | 2·99 | 143 | 1·63 | 192 | 0·54 | 128 | 0·07 | 336 | 0·05 | 227 | 0·042 | ⊙ | ⊙ | |
| 5 | Falmouth | 3·00 | 147 | 1·64 | 196 | 0·56 | 128 | 0·09 | 352 | 0·08 | 224 | 0·046 | ⊙ | ⊙ | |
| 7 | Mevagissey | 3·14 | 151 | 1·62 | 206 | 0·54 | 112 | 0·08 | 355 | 0·05 | 202 | 0·044 | ⊙ | ⊙ | |
| 7a | Par | 3·12 | 155 | 1·57 | 203 | 0·57 | 121 | 0·07 | 348 | 0·07 | 206 | 0·046 | 108 | 0·005 | |
| 8 | Fowey | 3·14 | 147 | 1·66 | 198 | 0·54 | 097 | 0·06 | 307 | 0·06 | 208 | 0·044 | ⊙ | ⊙ | |
| 14 | **PLYMOUTH (DEVONPORT)** | 3·30 | 155 | 1·69 | 207 | 0·61 | 113 | 0·08 | 348 | 0·06 | 185 | 0·049 | 078 | 0·006 | |
| 14a | Saltash | 3·36 | 156 | 1·58 | 206 | 0·62 | 122 | 0·07 | 347 | 0·06 | 164 | 0·048 | 044 | 0·005 | |
| 14b | Cargreen | 3·39 | 155 | 1·67 | 222 | 0·51 | 104 | 0·06 | 303 | 0·07 | 199 | 0·056 | 058 | 0·018 | |
| 14c | Cotehele Quay | 2·40 | 162 | 1·57 | 245 | 0·53 | 118 | 0·07 | 309 | 0·06 | 280 | 0·055 | 130 | 0·019 | |
| 14e | Jupiter Point | 3·35 | 156 | 1·68 | 212 | 0·60 | 112 | 0·08 | 350 | 0·04 | 174 | 0·054 | 046 | 0·006 | |
| 14f | St. Germans | 3·34 | 154 | 1·64 | 206 | 0·58 | 122 | 0·06 | 002 | 0·04 | 224 | 0·056 | 141 | 0·016 | *m* |
| 15 | Turnchapel | 3·32 | 153 | 1·64 | 207 | 0·60 | 097 | 0·08 | 348 | 0·06 | 191 | 0·044 | 073 | 0·007 | |
| 15a | Bovisand Pier | 3·30 | 151 | 1·61 | 210 | 0·58 | 124 | 0·10 | 342 | 0·10 | 210 | 0·050 | ⊙ | ⊙ | *l* |
| 17 | River Yealm Entrance | 3·18 | 155 | 1·63 | 207 | 0·58 | 149 | 0·08 | 013 | 0·05 | 198 | 0·045 | 078 | 0·008 | |
| 20 | Salcombe | 3·10 | 161 | 1·52 | 215 | 0·57 | 117 | 0·07 | 351 | 0·06 | 167 | 0·047 | 029 | 0·007 | |
| 21 | Start Point | 3·20 | 162 | 1·53 | 211 | 0·63 | 106 | 0·07 | 010 | 0·07 | 134 | 0·023 | 011 | 0·006 | |
| 23 | Dartmouth | 2·93 | 162 | 1·42 | 220 | 0·56 | 106 | 0·08 | 329 | 0·05 | 127 | 0·059 | 351 | 0·019 | |
| 23a | Greenway Quay | 2·94 | 173 | 1·40 | 227 | 0·58 | 110 | 0·12 | 322 | 0·07 | 136 | 0·034 | 337 | 0·012 | |
| 23b | Totnes | 1·51 | 175 | 1·13 | 233 | 0·45 | 121 | 0·07 | 352 | 0·06 | 358 | 0·042 | 184 | 0·005 | |
| 25 | Torquay | 2·89 | 172 | 1·31 | 227 | 0·55 | 111 | 0·12 | 356 | 0·06 | 111 | 0·040 | 315 | 0·016 | |
| 26 | Teignmouth (Approaches) | 2·74 | 172 | 1·28 | 228 | 0·54 | 114 | 0·12 | 354 | 0·07 | 109 | 0·060 | 312 | 0·020 | |
| 26a | Teignmouth (Shaldon Bridge) | 2.76 | 179 | 1·24 | 239 | 0·51 | 120 | 0·10 | 352 | 0·06 | 104 | 0·051 | 333 | 0·030 | |
| 26b | Exmouth (Approaches) | 2·51 | 174 | 1·25 | 230 | 0·47 | 106 | 0·05 | 358 | 0·05 | 080 | 0·067 | 269 | 0·018 | |
| 27 | Exmouth Dock | 2·10 | 181 | 1·31 | 247 | 0·51 | 113 | 0·09 | 352 | 0·05 | 108 | 0·031 | 356 | 0·027 | |
| 27a | Starcross | 2·19 | 184 | 1·10 | 251 | 0·42 | 118 | 0·07 | 013 | 0·06 | 048 | 0·038 | 322 | 0·018 | |
| 28 | Lyme Regis | 2·44 | 178 | 1·11 | 229 | 0·51 | 107 | 0·11 | 008 | 0·04 | 079 | 0·064 | 276 | 0·029 | |
| 29 | Bridport (West Bay) | 2·43 | 177 | 1·11 | 236 | 0·48 | 107 | 0·09 | 355 | 0·05 | 065 | 0·086 | 267 | 0·036 | |
| 30 | Chesil Beach | 2·28 | 183 | 1·08 | 242 | 0·46 | 107 | 0·09 | 348 | 0·04 | 059 | 0·081 | 276 | 0·034 | *x* |
| 31 | Chesil Cove | 2·27 | 181 | 1·08 | 226 | 0·49 | 128 | 0·06 | 357 | 0·04 | 048 | 0·070 | 263 | 0·025 | |
| 33 | **PORTLAND** | 1·01 | 191 | *v* | 242 | 0·31 | 109 | 0·09 | 346 | 0·05 | 004 | 0·305 | 204 | 0·215 | |
| 35 | Swanage | 1·49 | 260 | 0·36 | 285 | 0·18 | 130 | 0·09 | 349 | 0·05 | 230 | 0·858 | 019 | 0·820 | |
| 36 | Poole (Entrance) | 1·49 | 284 | 0·39 | 306 | 0·18 | 110 | 0·08 | 123 | 0·05 | 222 | 0·829 | 342 | 0·600 | |
| 36a | Poole (Town Quay) | 1·49 | 287 | 0·39 | 306 | 0·16 | 120 | 0·08 | 350 | 0·04 | 222 | 0·966 | 005 | 0·794 | |
| 36b | Pottery Pier | 1·49 | 294 | 0·39 | 313 | 0·16 | 136 | 0·08 | 343 | 0·03 | 218 | 0·923 | 007 | 0·668 | |
| 37 | Bournemouth | 1·49 | 270 | 0·40 | 299 | 0·18 | 112 | 0·10 | 015 | 0·04 | 217 | 0·913 | 003 | 0·695 | |
| 38 | Christchurch (Entrance) | 1·17 | 285 | 0·42 | 312 | 0·12 | 123 | 0·09 | 347 | 0·04 | 201 | 0·637 | 311 | 0·239 | |
| 38a | Christchurch (Tuckton) | 1·14 | 334 | 0·29 | 313 | 0·11 | 116 | 0·07 | 335 | 0·03 | 211 | 0·829 | 234 | 0·436 | |
| 39 | Hurst Point | 1·97 | 314 | 0·71 | 357 | 0·21 | 125 | 0·07 | 004 | 0·05 | 124 | 0·262 | 262 | 0·117 | |
| 40 | Lymington | 2·04 | 320 | 0·78 | 000 | 0·24 | 135 | 0·09 | 022 | 0·04 | 117 | 0·270 | 262 | 0·156 | |
| 42 | Bucklers Hard | 2·40 | 328 | 1·04 | 013 | 0·32 | 114 | 0·10 | 008 | 0·02 | 099 | 0·144 | 250 | 0·097 | |
| 43 | Stansore Point | 2·39 | 328 | 1·11 | 020 | 0·34 | 130 | 0·09 | 347 | 0·03 | 084 | 0·136 | 234 | 0·044 | |
| 45 | Yarmouth | 2·03 | 311 | 0·71 | 350 | 0·24 | 102 | 0·08 | 349 | 0·03 | 118 | 0·325 | 276 | 0·219 | |
| 46 | Totland Bay | 1·88 | 298 | 0·58 | 329 | 0·22 | 104 | 0·09 | 344 | 0·06 | 155 | 0·434 | 302 | 0·323 | |
| 48 | Freshwater | 1·62 | 289 | 0·59 | 317 | 0·22 | 108 | 0·09 | 336 | 0·05 | 172 | 0·416 | 303 | 0·195 | |
| 51 | Ventnor | 2·33 | 311 | 0·95 | 012 | 0·21 | 114 | 0·06 | 010 | 0·03 | 094 | 0·176 | ⊙ | ⊙ | |
| 53 | Sandown | 2·41 | 317 | 1·19 | 008 | 0·38 | 135 | 0·07 | 025 | 0·08 | 091 | 0·053 | ⊙ | ⊙ | |
| 53a | Foreland Lifeboat Slip | 2·82 | 323 | 1·39 | 010 | 0·43 | 102 | 0·09 | 317 | 0·03 | 074 | 0·088 | 239 | 0·028 | |
| 58 | Ryde | 2·76 | 325 | 1·30 | 010 | 0·44 | 094 | 0·09 | 028 | 0·02 | 087 | 0·112 | 241 | 0·043 | |
| 60 | Cowes | 2·67 | 329 | 1·19 | 021 | 0·37 | 108 | 0·07 | 344 | 0·03 | 076 | 0·138 | 231 | 0·074 | |
| 61 | Calshot Castle | 2·96 | 328 | 1·30 | 014 | 0·45 | 113 | 0·08 | 021 | 0·01 | 090 | 0·117 | 241 | 0·042 | |
| 62 | **SOUTHAMPTON** | 2·87 | 328 | 1·38 | 013 | 0·42 | 116 | 0·09 | 342 | 0·03 | 091 | 0·120 | 245 | 0·057 | |
| 62a | Redbridge | 2·82 | 327 | 1·31 | 015 | 0·45 | 106 | 0·09 | 352 | 0·02 | 092 | 0·126 | 245 | 0·061 | |
| 63 | Warsash | 2·95 | 330 | 1·28 | 018 | 0·37 | 104 | 0·10 | 326 | 0·02 | 083 | 0·127 | 243 | 0·056 | |
| 63a | Bursledon | 3·05 | 333 | 1·26 | 022 | 0·40 | 106 | 0·09 | 340 | 0·02 | 086 | 0·146 | 248 | 0·062 | |

⊙ No data.
*i* Constants inferred.
*l* Constants from 15 days' observations.
*m* Constants from 3 days' observations.
*v* Owing to large seasonal variations, see table across.
*w* Owing to large fortnightly variations, see Table VI.
*x* M.L. inferred.

| No. | PLACE | M.L. $Z_0$ | HARMONIC CONSTANTS $M_2$ | | $S_2$ | | Zone U.T.(G.M.T.) $K_1$ | | $O_1$ | | S.W. CORRECTIONS ¼-diurnal | | ⅛-diurnal | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | m. | g° | H.m. | g° | H.m. | g° | H.m. | g° | H.m. | $f_4$ | $F_4$ | $f_6$ | $F_6$ | |
| 65 | **PORTSMOUTH** | 2·87 | 326 | *v* | 012 | 0·43 | 113 | 0·09 | 350 | 0·03 | 077 | 0·102 | 240 | 0·048 | |
| 68 | Chichester Harbour (Entrance) | 2·83 | 326 | 1·49 | 010 | 0·47 | 127 | 0·06 | 001 | 0·06 | 087 | 0·063 | 276 | 0·018 | |
| 68a | Northney | 2·73 | 330 | 1·55 | 018 | 0·48 | 123 | 0·08 | 050 | 0·04 | 085 | 0·071 | 254 | 0·024 | |
| 68c | Itchenor | 2·90 | 330 | 1·43 | 016 | 0·45 | 115 | 0·08 | 325 | 0·03 | 089 | 0·060 | 273 | 0·032 | |
| 69 | Selsey Bill | 2·94 | 321 | 1·69 | 010 | 0·58 | 111 | 0·09 | 258 | 0·02 | 064 | 0·029 | 271 | 0·008 | |
| 70 | Nab Tower | 2·58 | 317 | 1·43 | 001 | 0·45 | 113 | 0·09 | 342 | 0·01 | 084 | 0·074 | 249 | 0·017 | |
| 73 | Bognor Regis | 3·14 | 323 | 1·82 | 010 | 0·60 | 154 | 0·05 | 015 | 0·08 | 057 | 0·018 | 293 | 0·006 | |
| 74a | Littlehampton (Norfolk Wharf) | 2·83 | 323 | 1·97 | 016 | 0·54 | 108 | 0·06 | 010 | 0·03 | 346 | 0·024 | ⊙ | ⊙ | |
| 81 | **SHOREHAM** | 3·40 | 322 | 2·15 | 011 | 0·70 | 102 | 0·08 | 353 | 0·02 | 354 | 0·017 | 265 | 0.003 | |
| 82 | Brighton | 3·49 | 322 | 2·18 | 008 | 0·69 | 154 | 0·07 | 027 | 0·05 | 345 | 0·013 | 295 | 0·003 | |
| 83 | Newhaven | 3·61 | 323 | 2·26 | 010 | 0·73 | 107 | 0·07 | 331 | 0·01 | 322 | 0·020 | ⊙ | ⊙ | |
| 84 | Eastbourne | 3·77 | 323 | 2·36 | 011 | 0·77 | 080 | 0·07 | 023 | 0·01 | 318 | 0·011 | ⊙ | ⊙ | |
| 85 | Hastings | 3·85 | 325 | 2·60 | 017 | 0·81 | 106 | 0·06 | 192 | 0·03 | 293 | 0·011 | ⊙ | ⊙ | |
| 86a | Rye (Harbour) | *w* | 327 | 2·18 | 021 | 0·52 | 103 | 0·05 | 230 | 0·04 | 347 | 0·064 | ⊙ | ⊙ | *l* |
| 87 | Dungeness | 4·13 | 326 | 2·65 | 020 | 0·86 | 092 | 0·07 | 155 | 0·04 | 287 | 0·042 | 194 | 0·003 | |
| 88 | Folkestone | 3·92 | 329 | 2·44 | 026 | 0·84 | 043 | 0·08 | 162 | 0·03 | 285 | 0·049 | 184 | 0·005 | |
| 89 | **DOVER** | 3·70 | 332 | *v* | 024 | 0·71 | 043 | 0·05 | 177 | 0·06 | 276 | 0·052 | 185 | 0·006 | |
| 98 | Deal | 3·54 | 335 | 2·05 | 021 | 0·63 | 355 | 0·02 | 179 | 0·13 | 271 | 0·050 | 175 | 0·004 | |
| 99 | Richborough | 1·42 | 344 | 1·50 | 039 | 0·24 | 024 | 0·04 | 179 | 0·04 | 314 | 0·120 | 196 | 0·029 | |
| 102 | Ramsgate | 2·56 | 339 | 1·86 | 030 | 0·56 | 012 | 0·08 | 182 | 0·09 | 281 | 0·038 | 191 | 0·007 | |
| 103 | **MARGATE** | 2·64 | 343 | *v* | 036 | 0·48 | 012 | 0·11 | 186 | 0·12 | 346 | 0·022 | 086 | 0.004 | |
| 104 | Herne Bay | 2·73 | 349 | 1·80 | 048 | 0·54 | 346 | 0·09 | 171 | 0·12 | 004 | 0·013 | 040 | 0·007 | |
| 108 | **SHEERNESS** | 3·06 | 354 | *v* | 051 | 0·58 | 014 | 0·11 | 189 | 0·13 | 025 | 0·023 | 049 | 0·007 | |
| 108a | Bee Ness | 2·98 | 357 | 2·05 | 056 | 0·60 | 032 | 0·12 | 202 | 0·13 | 033 | 0·025 | ⊙ | ⊙ | |
| 109 | Chatham (Lock Approaches) | 2·95 | 357 | 2·15 | 054 | 0·63 | 015 | 0·11 | 188 | 0·14 | 030 | 0·027 | 060 | 0·008 | |
| 109b | Rochester | 2·91 | 000 | 2·19 | 056 | 0·59 | 011 | 0·10 | 200 | 0·16 | 030 | 0·033 | ⊙ | ⊙ | |
| 109c | Wouldham | 2·69 | 008 | 1·99 | 067 | 0·53 | 024 | 0·14 | 204 | 0·10 | 359 | 0·047 | 069 | 0·010 | |
| 109d | New Hythe | 2·03 | 017 | 1·87 | 079 | 0·47 | 056 | 0·13 | 211 | 0·12 | 330 | 0·069 | 049 | 0·011 | |
| 109e | Allington Lock | 0·96 | 029 | 0·96 | 088 | 0·30 | 348 | 0·06 | 238 | 0·05 | 356 | 0·486 | 336 | 0·154 | |
| 110 | Southend-on-Sea | 3·02 | 354 | *v* | 049 | 0·59 | 011 | 0·11 | 188 | 0·13 | 021 | 0·022 | 050 | 0·006 | |
| 110a | Thames Haven | 3·15 | 000 | 2·17 | 056 | 0·63 | 014 | 0·12 | 192 | 0·13 | 012 | 0·021 | 057 | 0·005 | |
| 111 | Tilbury | 3·33 | 009 | 2·32 | 069 | 0·66 | 021 | 0·13 | 197 | 0·14 | 007 | 0·016 | 053 | 0·005 | |
| 112 | Woolwich | *w* | 021 | 2·53 | 084 | 0·74 | 027 | 0·13 | 202 | 0·14 | 358 | 0·010 | 053 | 0·007 | |
| 113 | **LONDON BRIDGE** | *w* | 033 | 2·55 | 100 | 0·72 | 031 | 0·14 | 215 | 0·14 | 318 | 0·011 | 039 | 0·009 | |
| 116a | Shivering Sand Tower | 2·75 | 347 | 1·80 | 040 | 0·52 | 010 | 0·10 | 185 | 0·13 | 010 | 0·024 | 032 | 0·007 | |
| 117 | S.E. Long Sand | 2·5 | 338 | 1·69 | 032 | 0·49 | 351 | 0·08 | 167 | 0·12 | 000 | 0·032 | 043 | 0·004 | *x* |
| 121 | Whitaker Beacon | 2·5 | 344 | 1·68 | 040 | 0·52 | 343 | 0·10 | 176 | 0·10 | 016 | 0·028 | 027 | 0·010 | *x* |
| 122 | Burnham-on-Crouch | 2·50 | 350 | 1·87 | 049 | 0·53 | 006 | 0·11 | 189 | 0·13 | 359 | 0·036 | 043 | 0·018 | |
| 122a | North Fambridge | 2·55 | 358 | 1·80 | 052 | 0·48 | 006 | 0·07 | 184 | 0·15 | 005 | 0·031 | 055 | 0·015 | |
| 122b | Hullbridge | 2·55 | 356 | 1·87 | 056 | 0·54 | 038 | 0·06 | 190 | 0·12 | 341 | 0·032 | 060 | 0·015 | |
| 123 | Bradwell-on-Sea | 2·85 | 345 | 1·72 | 045 | 0·52 | 014 | 0·12 | 187 | 0·13 | 040 | 0·026 | 033 | 0·015 | |
| 123a | Osea Island | 2·68 | 352 | 1·83 | 047 | 0·52 | 004 | 0·10 | 187 | 0·16 | 044 | 0·048 | 054 | 0·019 | |
| 124 | West Mersea | *w* | 348 | 1·69 | 047 | 0·45 | 017 | 0·08 | 177 | 0·15 | 349 | 0·041 | 026 | 0·012 | |
| 126 | Brightlingsea | 2·84 | 341 | 1·64 | 042 | 0·47 | 013 | 0·08 | 170 | 0·14 | 009 | 0·039 | ⊙ | ⊙ | |
| 128 | Clacton-on-Sea | 2·38 | 335 | 1·53 | 034 | 0·45 | 352 | 0·11 | 175 | 0·11 | 008 | 0·044 | 030 | 0·014 | |
| 129 | **WALTON-ON-THE-NAZE** | 2·23 | 332 | 1·40 | 024 | 0·40 | 358 | 0·11 | 178 | 0·13 | 015 | 0·044 | 013 | 0·018 | |
| 129a | Bramble Creek | 2·38 | 328 | 1·32 | 019 | 0·36 | 010 | 0·12 | 166 | 0·13 | 037 | 0·056 | 027 | 0·033 | |
| 130 | Sunk Head | 2·08 | 331 | 1·34 | 027 | 0·38 | 347 | 0·07 | 167 | 0·11 | 025 | 0·048 | 007 | 0·018 | |

SEASONAL CHANGES IN MEAN LEVEL AND HARMONIC CONSTANTS

| No. | | Jan. 1 | Feb. 1 | Mar. 1 | Apr. 1 | May 1 | June 1 | July 1 | Aug. 1 | Sep. 1 | Oct. 1 | Nov. 1 | Dec. 1 | Jan. 1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1–60 | | | | | | | | Negligible | | | | | | |
| 61–63a | | +0·1 | 0·0 | −0·1 | −0·1 | −0·1 | 0·0 | 0·0 | 0·0 | 0·0 | 0·0 | +0·1 | +0·1 | +0·1 |
| 64–130 | | | | | | | | Negligible | | | | | | |
| 33 | $M_2$ | 0·62 | 0·61 | 0·59 | 0·57 | 0·58 | 0·60 | 0·61 | 0·61 | 0·60 | 0·59 | 0·60 | 0·61 | 0·62 |
| 65 | $M_2$ | 1·41 | 1·41 | 1·42 | 1·42 | 1·41 | 1·39 | 1·39 | 1·40 | 1·42 | 1·42 | 1·42 | 1·41 | 1·41 |
| 89 | $M_2$ | 2·24 | 2·24 | 2·25 | 2·25 | 2·23 | 2·21 | 2·21 | 2·25 | 2·28 | 2·30 | 2·29 | 2·26 | 2·24 |
| 103 | $M_2$ | 1·62 | 1·60 | 1·60 | 1·59 | 1·58 | 1·57 | 1·59 | 1·64 | 1·69 | 1·70 | 1·68 | 1·65 | 1·62 |
| 108 | $M_2$ | 2·00 | 2·00 | 2·02 | 2·03 | 2·01 | 1·97 | 1·97 | 2·01 | 2·06 | 2·08 | 2·07 | 2·03 | 2·00 |
| 109 | $M_2$ | 2·18 | 2·17 | 2·14 | 2·12 | 2·13 | 2·16 | 2·18 | 2·17 | 2·14 | 2·12 | 2·13 | 2·16 | 2·18 |
| 110 | $M_2$ | 2·01 | 2·02 | 2·05 | 2·08 | 2·09 | 2·07 | 2·05 | 2·03 | 2·03 | 2·04 | 2·03 | 2·02 | 2·01 |

| No. | PLACE | M.L. $Z_0$ m. | HARMONIC CONSTANTS $M_2$ g° | $M_2$ H.m. | $S_2$ g° | $S_2$ H.m. | Zone U.T.(G.M.T.) $K_1$ g° | $K_1$ H.m. | $O_1$ g° | $O_1$ H.m. | S.W. CORRECTIONS ¼-diurnal $f_4$ | ¼-diurnal $F_4$ | ⅛-diurnal $f_6$ | ⅛-diurnal $F_6$ | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 391 | Southend, Kintyre | 1·17 | 344 | 0·71 | 042 | 0·20 | 201 | 0·07 | 051 | 0·09 | ⊙ | ⊙ | ⊙ | ⊙ | |
| 393 | Campbeltown | 1·80 | 349 | 0·92 | 044 | 0·21 | 192 | 0·10 | 045 | 0·11 | 115 | 0·073 | 022 | 0·006 | |
| 393a | Carradale | 1·85 | 347 | 1·02 | 033 | 0·27 | 192 | 0·10 | 057 | 0·08 | 129 | 0·068 | 342 | 0·014 | |
| 393b | Loch Ranza | 1·71 | 342 | 1·07 | 037 | 0·29 | 190 | 0·11 | 044 | 0·10 | 116 | 0·068 | ⊙ | ⊙ | |
| 394 | East Loch Tarbert | 1·92 | 346 | 1·16 | 041 | 0·35 | 192 | 0·10 | 039 | 0·10 | 110 | 0·076 | ⊙ | ⊙ | |
| 396 | Rubha Bodach | 1·78 | 340 | 1·00 | 037 | 0·24 | 200 | 0·09 | 046 | 0·08 | 112 | 0·084 | 358 | 0·030 | |
| 396a | Tighnabruich | 2·08 | 344 | 1·05 | 037 | 0·22 | 194 | 0·08 | 045 | 0·08 | 130 | 0·120 | 026 | 0·022 | |
| 398 | Millport | 1·94 | 343 | 1·13 | 035 | 0·30 | 191 | 0·11 | 045 | 0·10 | 119 | 0·074 | 355 | 0·018 | |
| 399 | Rothesay Bay | 1·90 | 340 | 1·16 | 035 | 0·27 | 188 | 0·09 | 040 | 0·07 | 110 | 0·071 | 001 | 0·030 | |
| 399b | Coulport | 1·82 | 342 | 1·22 | 034 | 0·29 | 180 | 0·10 | 050 | 0·10 | 125 | 0·091 | ⊙ | ⊙ | |
| 399c | Lochgoilhead | 1·71 | 344 | 1·14 | 030 | 0·32 | 193 | 0·12 | 031 | 0·09 | 126 | 0·108 | 346 | 0·030 | |
| 402 | Rosneath | 2·02 | 344 | 1·17 | 038 | 0·33 | 210 | 0·11 | 053 | 0·10 | 120 | 0·095 | 358 | 0·029 | |
| 404 | **GREENOCK** | 1·99 | 346 | *v* | 038 | 0·31 | 193 | 0·11 | 048 | 0·10 | 118 | 0·093 | 001 | 0·027 | |
| 407 | Glasgow | 2·77 | 355 | 1·44 | 044 | 0·37 | 203 | 0·10 | 056 | 0·09 | 172 | 0·074 | 047 | 0·055 | |
| 408 | Brodick Bay | 1·86 | 347 | 1·04 | 041 | 0·26 | 201 | 0·09 | 035 | 0·09 | 106 | 0·072 | ⊙ | ⊙ | |
| 410 | Ardrossan | 1·86 | 343 | 1·07 | 036 | 0·27 | 183 | 0·10 | 051 | 0·09 | 122 | 0·086 | 334 | 0·020 | |
| 412 | Troon | 1·91 | 340 | 1·09 | 033 | 0·30 | 195 | 0·12 | 037 | 0·11 | 114 | 0·074 | ⊙ | ⊙ | |
| 414 | Girvan | 1·82 | 340 | 1·05 | 028 | 0·28 | 183 | 0·12 | 040 | 0·10 | 127 | 0·057 | ⊙ | ⊙ | |
| 415 | Portpatrick | 2·08 | 333 | 1·34 | 016 | 0·38 | 190 | 0·11 | 042 | 0·10 | ⊙ | ⊙ | ⊙ | ⊙ | |
| 420 | Drummore | 3·32 | 337 | 2·02 | 021 | 0·67 | 189 | 0·11 | 046 | 0·10 | 296 | 0·014 | ⊙ | ⊙ | |
| 421 | Isle of Whithorn | 3·74 | 334 | 2·36 | 019 | 0·73 | 178 | 0·16 | 062 | 0·12 | 309 | 0·019 | ⊙ | ⊙ | |
| 424 | Hestan Islet | 4·21 | 339 | 2·76 | 022 | 0·86 | 181 | 0·11 | 032 | 0·12 | 318 | 0·016 | ⊙ | ⊙ | *l* |
| 434 | Workington | 4·42 | 332 | 2·73 | 015 | 0·87 | 197 | 0·12 | 042 | 0·11 | 310 | 0·017 | 046 | 0·001 | |
| 435 | Whitehaven | 4·53 | 331 | 2·60 | 009 | 0·80 | 172 | 0·12 | 042 | 0·11 | 300 | 0·017 | ⊙ | ⊙ | |
| 439 | Barrow (Ramsden Dock) | 5·00 | 331 | *v* | 015 | *v* | 196 | 0·12 | 045 | 0·11 | 306 | 0·022 | 143 | 0·001 | |
| 439a | Roa Island | 5·00 | 329 | *v* | 012 | *v* | 190 | 0·12 | 044 | 0·11 | 308 | 0·023 | 117 | 0·001 | |
| 439b | Haws Point | 4·89 | 328 | 3·07 | 010 | 1·00 | 191 | 0·14 | 048 | 0·11 | 308 | 0·023 | ⊙ | ⊙ | |
| 439c | Halfway Shoal | 4·71 | 325 | *v* | 007 | 0·97 | 194 | 0·12 | 043 | 0·11 | 300 | 0·021 | 112 | 0·001 | *x* |
| 441 | Heysham | 5·10 | 325 | *v* | 008 | *v* | 193 | 0·12 | 040 | 0·11 | 310 | 0·019 | ⊙ | ⊙ | |
| 444 | Fleetwood | 4·98 | 326 | 3·05 | 009 | 0·97 | 190 | 0·12 | 041 | 0·11 | 297 | 0·021 | 270 | 0·001 | |
| 448 | Formby | 5·15 | 316 | 3·12 | 359 | 0·98 | 190 | 0·12 | 043 | 0·12 | 316 | 0·026 | 169 | 0·002 | |
| 451 | New Brighton | 5·04 | 320 | 3·02 | 002 | 1·01 | 210 | 0·15 | 040 | 0·11 | 282 | 0·025 | 089 | 0·002 | |
| 452 | **LIVERPOOL** | 5·14 | 323 | *v* | 007 | 1·01 | 192 | 0·12 | 042 | 0·11 | 287 | 0·023 | 072 | 0·002 | |
| 453 | Eastham | *w* | 324 | 3·33 | 010 | 1·10 | 185 | 0·12 | 043 | 0·12 | 290 | 0·023 | 036 | 0·002 | *x* |
| 461 | Hilbre Island | 5·14 | 317 | 2·92 | 000 | 0·95 | 189 | 0·11 | 039 | 0·11 | 290 | 0·023 | ⊙ | ⊙ | |
| 466 | Peel | 2·90 | 324 | 1·80 | 006 | 0·54 | 188 | 0·11 | 078 | 0·05 | 272 | 0·021 | ⊙ | ⊙ | |
| 467 | Ramsey | 4·16 | 327 | 2·49 | 009 | 0·76 | 192 | 0·10 | 040 | 0·09 | 319 | 0·016 | ⊙ | ⊙ | |
| 468 | Douglas | 3·78 | 327 | 2·31 | 007 | 0·72 | 192 | 0·12 | 049 | 0·10 | 298 | 0·011 | ⊙ | ⊙ | |
| 468a | Port St. Mary | 3·21 | 325 | 1·95 | 003 | 0·63 | 191 | 0·10 | 037 | 0·11 | ⊙ | ⊙ | ⊙ | ⊙ | |
| 469a | Port Erin | 2·73 | 321 | 1·76 | 359 | 0·56 | 181 | 0·08 | 042 | 0·10 | ⊙ | ⊙ | ⊙ | ⊙ | |
| 471 | Llandudno | 4·03 | 308 | 2·67 | 345 | 0·85 | 185 | 0·13 | 040 | 0·11 | 286 | 0·016 | ⊙ | ⊙ | |
| 472 | Beaumaris | *w* | 312 | 2·54 | 350 | 0·75 | 192 | 0·12 | 027 | 0·12 | 282 | 0·021 | ⊙ | ⊙ | |
| 473 | Menai Bridge | 4·05 | 316 | 2·33 | 357 | 0·76 | 202 | 0·12 | 065 | 0·06 | 284 | 0·021 | ⊙ | ⊙ | |
| 474 | Port Dinorwic | 3·38 | 302 | 1·71 | 339 | 0·52 | 208 | 0·08 | 065 | 0·05 | 239 | 0·044 | 004 | 0·005 | |
| 475 | Caernarfon | 3·04 | 292 | 1·61 | 332 | 0·53 | 200 | 0·14 | 057 | 0·06 | 254 | 0·052 | ⊙ | ⊙ | |
| 475a | Fort Belan | 2·83 | 285 | 1·43 | 320 | 0·49 | 182 | 0·12 | 052 | 0·06 | 222 | 0·045 | 081 | 0·009 | |
| 476 | Trwyn Dinmor | 4·23 | 310 | 2·47 | 351 | 0·80 | 193 | 0·05 | 048 | 0·10 | 267 | 0·013 | ⊙ | ⊙ | |
| 476a | Moelfre | 4·17 | 308 | 2·47 | 348 | 0·81 | 201 | 0·09 | 039 | 0·09 | 279 | 0·010 | 148 | 0·001 | |
| 477 | Amlwch | 4·08 | 305 | 2·30 | 345 | 0·75 | 187 | 0·12 | 042 | 0·10 | 302 | 0·012 | ⊙ | ⊙ | |
| 477a | Cemaes Bay | 3·67 | 307 | 2·13 | 345 | 0·71 | 178 | 0·13 | 045 | 0·12 | 298 | 0·008 | 073 | 0·001 | |
| 478 | **HOLYHEAD** | 3·21 | 292 | 1·81 | 328 | 0·60 | 175 | 0·10 | 030 | 0·10 | 179 | 0·009 | 070 | 0·004 | |

SEASONAL CHANGES IN MEAN LEVEL AND HARMONIC CONSTANTS

| No. | | Jan. 1 | Feb. 1 | Mar. 1 | Apr. 1 | May 1 | June 1 | July 1 | Aug. 1 | Sep. 1 | Oct. 1 | Nov. 1 | Dec. 1 | Jan. 1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 308–390 | | +0·1 | 0·0 | 0·0 | 0·0 | −0·1 | −0·1 | −0·1 | 0·0 | 0·0 | 0·0 | 0·0 | +0·1 | +0·1 |
| 391–398 | | +0·1 | 0·0 | −0·1 | −0·1 | −0·1 | −0·1 | 0·0 | 0·0 | 0·0 | 0·0 | +0·1 | +0·1 | +0·1 |
| 399–407 | | +0·2 | +0·1 | 0·0 | −0·1 | −0·1 | −0·1 | −0·1 | −0·1 | 0·0 | 0·0 | +0·1 | +0·2 | +0·2 |
| 408–414 | | +0·1 | 0·0 | −0·1 | −0·1 | −0·1 | −0·1 | 0·0 | 0·0 | 0·0 | 0·0 | +0·1 | +0·1 | +0·1 |
| 415–444 | | 0·0 | 0·0 | 0·0 | −0·1 | −0·1 | 0·0 | 0·0 | 0·0 | 0·0 | 0·0 | +0·1 | +0·1 | 0·0 |
| 445–464 | | 0·0 | 0·0 | −0·1 | −0·1 | 0·0 | 0·0 | 0·0 | 0·0 | 0·0 | 0·0 | +0·1 | +0·1 | 0·0 |
| 466–478 | | +0·1 | 0·0 | 0·0 | −0·1 | −0·1 | −0·1 | 0·0 | 0·0 | 0·0 | 0·0 | +0·1 | +0·1 | +0·1 |
| 404 | $M_2$ | 1·15 | 1·16 | 1·18 | 1·18 | 1·16 | 1·13 | 1·12 | 1·14 | 1·17 | 1·19 | 1·18 | 1·16 | 1·15 |
| 439 | $M_2$ | 3·07 | 3·08 | 3·09 | 3·09 | 3·06 | 3·04 | 3·05 | 3·08 | 3·11 | 3·12 | 3·10 | 3·08 | 3·07 |
| | $S_2$ | 1·01 | 1·01 | 0·99 | 0·98 | 0·99 | 1·01 | 1·02 | 1·02 | 0·99 | 0·98 | 0·99 | 1·00 | 1·01 |
| 439a | $M_2$ | 3·06 | 3·06 | 3·07 | 3·07 | 3·05 | 3·03 | 3·02 | 3·05 | 3·08 | 3·10 | 3·09 | 3·07 | 3·06 |
| | $S_2$ | 1·00 | 0·98 | 0·94 | 0·93 | 0·95 | 1·00 | 1·02 | 1·02 | 0·99 | 0·97 | 0·97 | 1·00 | 1·00 |
| 439c | $M_2$ | 2·97 | 2·98 | 2·99 | 2·98 | 2·95 | 2·92 | 2·93 | 2·96 | 3·00 | 3·00 | 2·99 | 2·97 | 2·97 |
| 441 | $M_2$ | 3·19 | 3·17 | 3·17 | 3·16 | 3·15 | 3·14 | 3·15 | 3·18 | 3·22 | 3·25 | 3·24 | 3·22 | 3·19 |
| | $S_2$ | 1·05 | 1·04 | 1·02 | 1·02 | 1·04 | 1·06 | 1·07 | 1·05 | 1·01 | 1·00 | 1·01 | 1·04 | 1·05 |
| 452 | $M_2$ | 3·13 | 3·13 | 3·12 | 3·12 | 3·15 | 3·18 | 3·18 | 3·15 | 3·10 | 3·07 | 3·08 | 3·12 | 3·13 |

| No. | PLACE | M.L. $Z_0$ m. | HARMONIC CONSTANTS Zone −0100 $M_2$ g° | $M_2$ H.m. | $S_2$ g° | $S_2$ H.m. | $K_1$ g° | $K_1$ H.m. | $O_1$ g° | $O_1$ H.m. | S.W. CORRECTIONS ¼-diurnal $f_4$ | ¼-diurnal $F_4$ | ⅛-diurnal $f_6$ | ⅛-diurnal $F_6$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1131 | Kirkenes | 1·86 | 137 | 1·06 | 183 | 0·30 | 274 | 0.12 | 083 | 0·03 | ⊙ | ⊙ | ⊙ | ⊙ |
| 1133 | Vadso | 1·90 | 138 | 1·05 | 184 | 0·30 | 272 | 0·12 | 081 | 0·03 | ⊙ | ⊙ | ⊙ | ⊙ |
| 1134 | Vardø | 1·78 | 131 | 1·01 | 173 | 0·29 | 267 | 0·12 | 083 | 0·03 | ⊙ | ⊙ | ⊙ | ⊙ |
| 1137 | Berlevag | 1·57 | 111 | 0·89 | 153 | 0·25 | 259 | 0·10 | 077 | 0·02 | ⊙ | ⊙ | ⊙ | ⊙ |
| 1145 | Honningsvag | 1·53 | 080 | 0·86 | 120 | 0·25 | 244 | 0·09 | 069 | 0·03 | ⊙ | ⊙ | ⊙ | ⊙ |
| 1150 | Hammerfest | 1·58 | 048 | 0·89 | 087 | 0·28 | 229 | 0·08 | 062 | 0·03 | ⊙ | ⊙ | ⊙ | ⊙ |
| 1163 | Tromsø | 1·50 | 030 | 0·84 | 072 | 0·28 | 224 | 0·07 | 063 | 0·04 | ⊙ | ⊙ | ⊙ | ⊙ |
| 1174 | Harstad | 1·26 | 013 | 0·69 | 052 | 0·24 | 214 | 0·06 | 054 | 0·05 | ⊙ | ⊙ | ⊙ | ⊙ |
| 1176 | Sandtorg | 1·38 | 002 | 0·74 | 041 | 0·26 | 207 | 0·06 | 003 | 0·02 | ⊙ | ⊙ | ⊙ | ⊙ |
| 1177 | Andenes | 1·17 | 010 | 0·65 | 050 | 0·22 | 199 | 0·05 | 060 | 0·04 | ⊙ | ⊙ | ⊙ | ⊙ |
| 1178 | Risøyhamn | 1·20 | 012 | 0·68 | 052 | 0·21 | 238 | 0·03 | 047 | 0·04 | ⊙ | ⊙ | ⊙ | ⊙ |
| 1187 | Lødingen | 1·72 | 003 | 0·93 | 041 | 0·32 | 212 | 0·10 | 060 | 0·02 | 334 | 0·094 | ⊙ | ⊙ |
| 1188 | **NARVIK** | 1·80 | 000 | 0·94 | 040 | 0·34 | 211 | 0·12 | 032 | 0·01 | 345 | 0·044 | ⊙ | ⊙ |
| 1197 | Bodø | 1·61 | 000 | 0·87 | 039 | 0·30 | 209 | 0·10 | 056 | 0·04 | ⊙ | ⊙ | ⊙ | ⊙ |
| 1199a | Finneid | 0·96 | 055 | 0·53 | 195 | 0·15 | 250 | 0·08 | 101 | 0·03 | ⊙ | ⊙ | ⊙ | ⊙ |
| 1207 | Mo i Rana | 1·60 | 353 | 0·85 | 031 | 0·29 | 201 | 0·09 | 055 | 0·04 | ⊙ | ⊙ | ⊙ | ⊙ |
| 1208 | Sandnessjøen | 1·52 | 350 | 0·83 | 029 | 0·29 | 199 | 0·09 | 054 | 0·04 | ⊙ | ⊙ | ⊙ | ⊙ |
| 1209 | Mosjøen | 1·56 | 351 | 0·86 | 029 | 0·30 | 195 | 0·09 | 053 | 0·04 | ⊙ | ⊙ | ⊙ | ⊙ |
| 1211a | Bronnoysund | 1·52 | 347 | 0·83 | 025 | 0·29 | 192 | 0·08 | 054 | 0·04 | ⊙ | ⊙ | ⊙ | ⊙ |
| 1213 | Rørvik | 1·43 | 339 | 0·78 | 017 | 0·27 | 184 | 0·07 | 053 | 0·05 | 320 | 0.025 | 306 | 0.016 |
| 1219 | Trøndheim | 1·62 | 335 | 0·90 | 013 | 0·32 | 181 | 0·06 | 051 | 0·05 | 338 | 0·064 | 064 | 0·006 |
| 1224 | Heim | 1·43 | 329 | 0·78 | 007 | 0·27 | 179 | 0·06 | 048 | 0·06 | ⊙ | ⊙ | ⊙ | ⊙ |
| 1226 | Kristiansund | 1·24 | 324 | 0·67 | 001 | 0·23 | 181 | 0·06 | 042 | 0·06 | 315 | 0.021 | 226 | 0.017 |
| 1233 | Aalesund | 1·14 | 320 | 0·61 | 357 | 0·21 | 169 | 0·06 | 022 | 0·06 | 290 | 0.011 | 186 | 0.033 |
| 1237 | Maaløy | 1·06 | 314 | 0·58 | 352 | 0·20 | 166 | 0·05 | 016 | 0·05 | 264 | 0·004 | 182 | 0.029 |
| 1238 | Kjoelsdal | 1·10 | 313 | 0·60 | 352 | 0·20 | 169 | 0·04 | 016 | 0·04 | 097 | 0·003 | 196 | 0·050 |
| 1240 | Florø | 0·94 | 313 | 0·53 | 349 | 0·19 | 175 | 0·04 | 022 | 0·04 | ⊙ | ⊙ | ⊙ | ⊙ |
| 1258 | **BERGEN** | 0·85 | 312 | 0·45 | 353 | 0·16 | 177 | 0·03 | 025 | 0·03 | 079 | 0·042 | 336 | 0·020 |
| 1267 | Leirvik | 0·60 | 310 | 0·32 | 352 | 0·12 | 192 | 0·02 | 010 | 0·02 | 085 | 0·159 | 068 | 0·619 |
| 1271 | Haugesund | 0·49 | 304 | 0·23 | 350 | 0·09 | 185 | 0·02 | 019 | 0·02 | 080 | 0·168 | 351 | 0·776 |
| 1272 | Utsira | 0·43 | 306 | 0·21 | 355 | 0·08 | 176 | 0·02 | 023 | 0·02 | 074 | 0·181 | 317 | 1·042 |
| 1276 | Stavanger | 0·35 | 303 | 0·16 | 354 | 0·07 | 188 | 0·02 | 022 | 0·02 | 071 | 0·303 | 331 | 4.879 |
| 1284 | Tregde | 0·20 | 130 | 0·09 | 078 | 0·02 | — | 0·00 | 287 | 0·02 | ⊙ | ⊙ | ⊙ | ⊙ |
| 1290 | Arendal | 0·19 | 111 | 0·08 | 080 | 0·03 | — | 0·00 | 286 | 0·02 | ⊙ | ⊙ | ⊙ | ⊙ |
| 1294 | Nevlunghamn | 0·21 | 132 | 0·10 | 087 | 0·03 | — | 0·00 | 299 | 0·02 | ⊙ | ⊙ | ⊙ | ⊙ |
| 1295 | Helgeroa | 0·25 | 133 | 0·11 | 079 | 0·03 | — | 0·00 | 286 | 0·02 | 077 | 0·661 | 001 | 1·636 |
| 1296 | Horten | 0·24 | 139 | 0·11 | 087 | 0·03 | — | 0·00 | 284 | 0·02 | ⊙ | ⊙ | ⊙ | ⊙ |
| 1298 | South Kaholmen | 0·29 | 151 | 0·13 | 100 | 0·04 | — | 0·00 | 293 | 0·02 | ⊙ | ⊙ | ⊙ | ⊙ |
| 1300 | Oslo | 0·30 | 165 | 0·13 | 113 | 0·04 | — | 0·00 | 297 | 0·02 | ⊙ | ⊙ | ⊙ | ⊙ |

SEASONAL CHANGES IN MEAN LEVEL

| No. | Jan. 1 | Feb. 1 | Mar. 1 | Apr. 1 | May 1 | June 1 | July 1 | Aug. 1 | Sep. 1 | Oct. 1 | Nov. 1 | Dec. 1 | Jan. 1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1025–1037 | | | | | | | Negligible | | | | | | |
| 1038–1080 | 0·0 | −0·1 | −0·1 | 0·0 | 0·0 | +0·1 | 0·0 | 0·0 | 0·0 | 0·0 | +0·1 | 0·0 | 0·0 |
| 1082–1113 | | | | | | | Negligible | | | | | | |
| 1114–1181 | +0·1 | 0·0 | 0·0 | 0·0 | −0·1 | −0·1 | −0·1 | −0·1 | 0·0 | 0·0 | +0·1 | +0·1 | +0·1 |
| 1182–1196 | +0·1 | +0·1 | 0·0 | −0·1 | −0·1 | −0·1 | −0·1 | 0·0 | 0·0 | 0·0 | 0·0 | +0·1 | +0·1 |
| 1197–1236 | +0·1 | 0·0 | −0·1 | −0·1 | −0·1 | −0·1 | 0·0 | 0·0 | 0·0 | +0·1 | +0·1 | +0·1 | +0·1 |
| 1237–1276 | +0·1 | 0·0 | 0·0 | −0·1 | −0·1 | −0·1 | 0·0 | 0·0 | 0·0 | 0·0 | 0·0 | +0·1 | +0·1 |
| 1279–1294 | 0·0 | 0·0 | −0·1 | −0·1 | −0·1 | 0·0 | 0·0 | 0·0 | 0·0 | 0·0 | +0·1 | +0·1 | 0·0 |
| 1295–1300 | +0·1 | 0·0 | 0·0 | −0·1 | −0·1 | −0·1 | −0·1 | 0·0 | 0·0 | 0·0 | +0·1 | +0·1 | +0·1 |

| No. | PLACE | M.L. $Z_0$ m. | HARMONIC CONSTANTS Zone −0100 $M_2$ g° | $M_2$ H.m. | $S_2$ g° | $S_2$ H.m. | $K_1$ g° | $K_1$ H.m. | $O_1$ g° | $O_1$ H.m. | S.W. CORRECTIONS ¼-diurnal $f_4$ | ¼-diurnal $F_4$ | ½-diurnal $f_6$ | ½-diurnal $F_6$ | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1386 | Kobenhavn | 0·00 | 287 | 0·06 | 257 | 0·03 | 071 | 0·01 | 007 | 0·02 | ⊙ | ⊙ | ⊙ | ⊙ | |
| 1386a | Hornbaek | 0·00 | 264 | 0·07 | 229 | 0·02 | 350 | 0·01 | 338 | 0·03 | ⊙ | ⊙ | ⊙ | ⊙ | |
| 1387 | Korsor | 0·00 | 017 | 0·11 | 357 | 0·03 | 232 | 0·01 | 023 | 0·01 | ⊙ | ⊙ | ⊙ | ⊙ | |
| 1390 | Gedser | 0·00 | 197 | 0·04 | 213 | 0·01 | 183 | 0·02 | 145 | 0·02 | ⊙ | ⊙ | ⊙ | ⊙ | |
| 1392 | Slipshavn | 0·00 | 009 | 0·12 | 345 | 0·04 | 221 | 0·01 | 022 | 0·02 | ⊙ | ⊙ | ⊙ | ⊙ | |
| 1395 | Fredericia | 0·00 | 344 | 0·12 | 306 | 0·03 | 246 | 0·01 | 004 | 0·02 | ⊙ | ⊙ | ⊙ | ⊙ | |
| 1399 | Arhus | 0·00 | 314 | 0·14 | 281 | 0·04 | 085 | 0·01 | 343 | 0·03 | ⊙ | ⊙ | ⊙ | ⊙ | |
| 1409 | Frederikshavn | 0·2 | 169 | 0·12 | 122 | 0·03 | 287 | 0·01 | 238 | 0·01 | ⊙ | ⊙ | ⊙ | ⊙ | x |
| 1412 | Hirtshals | 0·2 | 125 | 0·11 | 080 | 0·04 | 338 | 0·01 | 267 | 0·01 | ⊙ | ⊙ | ⊙ | ⊙ | x |
| 1412a | Hanstholm | 0·2 | 134 | 0·12 | 044 | 0·03 | 201 | 0·02 | 016 | 0·02 | ⊙ | ⊙ | ⊙ | ⊙ | x |
| 1413 | Thyboron | 0·2 | 133 | 0·16 | 130 | 0·02 | 167 | 0·02 | 325 | 0·04 | 329 | 1·033 | ⊙ | ⊙ | x |
| 1417 | **ESBJERG** | 0·81 | 064 | 0·66 | 128 | 0·16 | 089 | 0·05 | 290 | 0·08 | 158 | 0·139 | ⊙ | ⊙ | |
| 1419 | Rømø Havn | 1·0 | 056 | 0·78 | 126 | 0·18 | 045 | 0·07 | 286 | 0·09 | ⊙ | ⊙ | ⊙ | ⊙ | x |
| 1430 | Husum | 2·09 | 033 | 1·41 | 112 | 0·38 | 077 | 0·05 | 267 | 0·09 | 198 | 0·064 | 067 | 0·015 | |
| 1431 | **HELGOLAND** | 1·39 | 340 | 1·11 | 045 | 0·30 | 040 | 0·06 | 250 | 0·09 | 242 | 0·060 | 074 | 0·017 | |
| 1436 | Büsum | 1·96 | 004 | 1·57 | 074 | 0·42 | 047 | 0·07 | 257 | 0·10 | 208 | 0·033 | 186 | 0·008 | |
| 1438 | **CUXHAVEN** | 1·75 | 011 | 1·42 | 080 | 0·37 | 053 | 0·07 | 260 | 0·09 | 244 | 0·060 | 104 | 0·026 | |
| 1439 | Brunsbüttel | 1·41 | 048 | 1·12 | 121 | 0·27 | 070 | 0·05 | 272 | 0·07 | 256 | 0·069 | 067 | 0·034 | |
| 1444 | Hamburg | 1·26 | 148 | 0·82 | 226 | 0·19 | 133 | 0·05 | 337 | 0·07 | 275 | 0·219 | ⊙ | ⊙ | |
| 1451 | Bremerhaven | 1·98 | 026 | 1·52 | 102 | 0·37 | 063 | 0·08 | 271 | 0·09 | 197 | 0·063 | 032 | 0·020 | |
| 1456 | Bremen | 1·65 | 084 | 1·42 | 168 | 0·32 | 092 | 0·04 | 281 | 0·05 | 274 | 0·080 | 060 | 0·018 | |
| 1463 | **WILHELMSHAVEN** | 2·31 | 006 | 1·74 | 078 | 0·45 | 051 | 0·06 | 262 | 0·09 | 180 | 0·040 | 048 | 0·012 | |
| 1469 | Nordeney (Riffgat) | 1·37 | 316 | 1·01 | 030 | 0·26 | 023 | 0·06 | 216 | 0·08 | 219 | 0·045 | 067 | 0·056 | |
| 1472 | Borkum (Fischerbalje) | 1·48 | 306 | 1·10 | 012 | 0·29 | 024 | 0·06 | 230 | 0·08 | 183 | 0·056 | 072 | 0·032 | |
| 1475 | Emden | 1·86 | 340 | 1·28 | 058 | 0·32 | 032 | 0·08 | 234 | 0·09 | 198 | 0·089 | 071 | 0·040 | |
| 1476 | Delfzijl | 2·09 | 334 | 1·35 | 045 | 0·34 | 041 | 0·07 | 244 | 0·09 | 201 | 0·096 | 072 | 0·032 | |
| 1478 | Lauwersoog | 1·65 | 279 | 1·07 | 344 | 0·29 | 017 | 0·07 | 222 | 0·09 | 192 | 0·100 | 086 | 0·032 | |
| 1483 | West Terschelling | 1·31 | 250 | 0·79 | 314 | 0·21 | 019 | 0·07 | 217 | 0·09 | 163 | 0·101 | 045 | 0·113 | |
| 1485 | Harlingen | 1·20 | 279 | 0·83 | 350 | 0·21 | 036 | 0·07 | 233 | 0·10 | 262 | 0·161 | 105 | 0·070 | |
| 1489 | Den Helder | 1·05 | 191 | 0·65 | 258 | 0·18 | 006 | 0·07 | 201 | 0·10 | 198 | 0·262 | 127 | 0·235 | |
| 1501 | IJmuiden | 0·95 | 129 | 0·68 | 197 | 0·18 | 359 | 0·08 | 190 | 0·11 | 282 | 0·447 | 256 | 0·163 | |
| 1505 | **HOEK VAN HOLLAND** | 0·90 | 085 | 0·79 | 145 | 0·19 | 000 | 0·07 | 187 | 0·10 | 350 | 0·287 | 230 | 0·103 | |
| 1508 | Rotterdam | 0·83 | 123 | 0·72 | 184 | 0·16 | 016 | 0·06 | 203 | 0·08 | 343 | 0·293 | 231 | 0·124 | |
| 1534 | **VLISSINGEN (FLUSHING)** | 2·30 | 059 | 1·74 | 116 | 0·48 | 012 | 0·06 | 189 | 0·10 | 000 | 0·044 | 288 | 0·018 | |
| 1536 | Terneuzen | 2·46 | 069 | 1·87 | 128 | 0·51 | 019 | 0·07 | 196 | 0·10 | 355 | 0·036 | 300 | 0·015 | |
| 1537 | Hansweert | 2·58 | 080 | 1·98 | 141 | 0·52 | 026 | 0·07 | 203 | 0·10 | 005 | 0·031 | 320 | 0·013 | |
| 1538 | Bath | 2·76 | 094 | 2·10 | 157 | 0·54 | 038 | 0·07 | 213 | 0·10 | 339 | 0·026 | 329 | 0·014 | |
| 1539 | **ANTWERP (PROSPERPOLDER)** | *w* | 092 | *v* | 155 | 0·58 | 037 | 0·07 | 209 | 0·11 | 344 | 0·028 | 338 | 0·015 | |
| 1539a | Boudewijnsluis | 2·81 | 104 | 2·01 | 169 | 0·54 | 032 | 0·09 | 225 | 0·08 | 317 | 0·032 | 331 | 0·016 | |
| 1539b | Royersluis | 2·84 | 109 | 2·11 | 175 | 0·56 | 028 | 0·08 | 225 | 0·08 | 317 | 0·033 | 348 | 0·012 | |
| 1562 | Zeebrugge | 2·36 | 043 | 1·71 | 098 | 0·49 | 006 | 0·06 | 183 | 0·10 | 001 | 0·033 | 287 | 0·021 | |
| 1564 | Oostende | 2·69 | 034 | 1·80 | 088 | 0·53 | 005 | 0·06 | 178 | 0·08 | 327 | 0·036 | 279 | 0·013 | |
| 1565 | Nieuwpoort | 2·37 | 029 | 1·95 | 083 | 0·58 | 009 | 0·05 | 179 | 0·09 | 314 | 0·033 | 271 | 0·008 | |

⊙ No data.
*i* Constants inferred.
*l* Constants from 15 days' observation.
*v* Owing to large seasonal variations, see table across.
*w* Owing to large fortnightly variations, see Table VI.
*x* M.L. inferred.

| No. | PLACE | M.L. $Z_0$ m. | HARMONIC CONSTANTS Zone −0100 $M_2$ g° | $M_2$ H.m. | $S_2$ g° | $S_2$ H.m. | $K_1$ g° | $K_1$ H.m. | $O_1$ g° | $O_1$ H.m. | S.W. CORRECTIONS ¼-diurnal $f_4$ | ¼-diurnal $F_4$ | ⅙-diurnal $f_6$ | ⅙-diurnal $F_6$ | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1568 | **DUNKERQUE** | 3·24 | 022 | 2·12 | 075 | 0·63 | 012 | 0·03 | 177 | 0·09 | 294 | 0·034 | 236 | 0·004 | |
| 1569a | Sandettie Bank | 3·2 | 010 | 2·13 | 065 | 0·66 | 035 | 0·04 | 183 | 0·08 | 287 | 0·039 | 200 | 0·005 | *x* |
| 1570 | **CALAIS** | 4·02 | 012 | 2.44 | 065 | 0·76 | 073 | 0·02 | 161 | 0·05 | 281 | 0·042 | 188 | 0·004 | |
| 1572 | **BOULOGNE** | 5·01 | 356 | 2·93 | 049 | 0·94 | 138 | 0·05 | 101 | 0·03 | 280 | 0·040 | 175 | 0·003 | |
| 1578 | Le Treport | 5·02 | 342 | 3·15 | 036 | 1·02 | 136 | 0·06 | 089 | 0·04 | 282 | 0·030 | 115 | 0·001 | |
| 1579 | **DIEPPE** | 4·97 | 340 | 3·11 | 031 | 1·02 | 139 | 0·08 | 050 | 0·04 | 284 | 0·027 | 087 | 0·001 | |
| 1581 | Fecamp | 4·85 | 326 | 2·68 | 015 | 0·87 | 139 | 0·08 | 042 | 0·05 | 243 | 0·017 | 106 | 0·004 | |
| 1582 | **LE HAVRE** | 4·87 | 315 | *v* | 003 | 0·88 | 134 | 0·09 | 028 | 0·05 | 227 | 0·036 | 151 | 0·009 | |
| 1582a | Antifer | 4·73 | 317 | 2·60 | 005 | 0·86 | 134 | 0·09 | 030 | 0·05 | 228 | 0·030 | 144 | 0·006 | |
| 1590 | Trouville | 4·50 | 310 | 2·48 | 350 | 0·92 | 130 | 0·09 | 017 | 0·06 | 289 | 0·040 | 245 | 0·008 | *i* |
| 1592 | Ouistreham | 4·44 | 314 | 2·57 | 001 | 0·91 | 145 | 0·06 | 019 | 0·05 | 228 | 0·042 | 156 | 0·010 | |
| 1594 | Port-en-Bessin | 4·22 | 303 | 2·33 | 348 | 0·79 | 125 | 0·11 | 016 | 0·04 | 224 | 0·041 | 173 | 0·007 | |
| 1596 | Rade de la Capelle | 4·27 | 296 | 2·19 | 344 | 0·76 | 135 | 0·08 | 009 | 0·06 | 223 | 0·043 | 180 | 0·006 | |
| 1598 | St. Vaast | 3·80 | 292 | 2·08 | 332 | 0·77 | 125 | 0·09 | 016 | 0·06 | 279 | 0·040 | 233 | 0·006 | *i* |
| 1599 | Barfleur | 3·94 | 289 | 1·97 | 334 | 0·68 | 126 | 0·09 | 008 | 0·06 | 220 | 0·026 | 228 | 0.003 | |
| 1600 | **CHERBOURG** | 3·78 | 257 | 1·86 | 301 | 0·70 | 121 | 0·09 | 010 | 0·06 | 259 | 0·038 | 122 | 0·004 | |
| 1601 | Omonville | 3·76 | 253 | 2·19 | 293 | 0·81 | 125 | 0·09 | 016 | 0·06 | 262 | 0·021 | 157 | 0·005 | *i* |
| 1602 | Goury | 4·84 | 232 | 2·45 | 272 | 0·90 | 125 | 0·09 | 016 | 0·06 | 177 | 0·035 | 170 | 0·007 | *i* |
| | | | | | | | **Zone U.T.(G.M.T.)** | | | | | | | | |
| 1603 | Braye | 3·62 | 204 | 1·86 | 247 | 0·73 | 079 | 0·10 | 356 | 0·05 | 270 | 0·017 | ⊙ | ⊙ | |
| 1603a | Maseline Pier | 4·87 | 189 | 2·63 | 236 | 0·98 | 072 | 0·16 | 004 | 0·06 | 352 | 0·021 | ⊙ | ⊙ | *l* |
| 1604 | St. Peter Port | 5·29 | 181 | 2·77 | 228 | 1·08 | 097 | 0·10 | 345 | 0·08 | 292 | 0·010 | 052 | 0·002 | |
| 1605 | **ST. HELIER** | 6·06 | 186 | 3·39 | 236 | 1·32 | 100 | 0·10 | 345 | 0·08 | 295 | 0·018 | — | 0·000 | |
| 1606 | St. Catherine Bay | 6·0 | 188 | 3·29 | 237 | 1·32 | 107 | 0·10 | 010 | 0·06 | 293 | 0·024 | 191 | 0·001 | *x* |
| 1606a | Bouley Bay | 5·76 | 184 | 3·24 | 234 | 1·23 | 086 | 0·10 | 354 | 0·09 | 303 | 0·021 | ⊙ | ⊙ | |
| | | | | | | | **Zone −0100** | | | | | | | | |
| 1609 | Iles Chausey | 7·50 | 218 | 3·94 | 258 | 1·46 | 111 | 0·09 | 355 | 0·09 | 266 | 0·035 | 177 | 0·002 | *i* |
| 1610 | Dielette | 5·51 | 223 | 3·07 | 263 | 1·13 | 111 | 0·09 | 355 | 0·09 | 300 | 0·026 | 034 | 0·002 | *i* |
| 1611 | Carteret | 6·30 | 220 | 3·25 | 268 | 1·27 | 119 | 0·09 | 355 | 0·09 | 290 | 0·023 | 045 | 0·001 | |
| 1611a | Le Sénéquet | 6·69 | 224 | 3·80 | 264 | 1·40 | 111 | 0·09 | 355 | 0·09 | 298 | 0·026 | 076 | 0·001 | *i* |
| 1612 | Granville | 7·21 | 213 | 3·93 | 263 | 1·53 | 107 | 0·09 | 351 | 0·09 | 285 | 0·022 | 182 | 0·001 | |
| 1613 | Cancale | 7·76 | 216 | 4·12 | 256 | 1·53 | 111 | 0·09 | 355 | 0·09 | 326 | 0·024 | 345 | 0·003 | *i* |
| 1614 | **ST. MALO** | 6·85 | 207 | 3·68 | 258 | 1·43 | 111 | 0·09 | 355 | 0·09 | 285 | 0·020 | 169 | 0.001 | |
| 1615 | Erquy | 6·40 | 200 | 3·48 | 250 | 1·34 | 120 | 0·08 | 350 | 0·08 | 280 | 0·015 | ⊙ | ⊙ | |
| 1616 | Dahouet | 6·28 | 197 | 3·50 | 246 | 1.34 | 120 | 0·08 | 350 | 0·08 | 275 | 0·014 | 111 | 0·001 | |
| 1617 | Le Légué | 6·3 | 205 | 3·61 | 245 | 1·34 | 111 | 0·09 | 355 | 0·09 | 345 | 0·027 | 004 | 0·004 | *ix* |
| 1618 | Binic | 6·31 | 199 | 3·47 | 249 | 1·35 | 121 | 0·08 | 351 | 0·08 | 275 | 0·013 | 104 | 0·001 | |
| 1619 | Portrieux | 6·38 | 203 | 3·61 | 243 | 1·34 | 111 | 0·09 | 355 | 0·09 | 298 | 0·017 | 043 | 0·001 | *i* |
| 1620 | Paimpol | 6·18 | 194 | 3·28 | 244 | 1·26 | 118 | 0·07 | 348 | 0·08 | 280 | 0·010 | ⊙ | ⊙ | |
| 1621 | Ile de Bréhat | 5·86 | 198 | 3·36 | 238 | 1·24 | 102 | 0·10 | 009 | 0·08 | 321 | 0·008 | 072 | 0·001 | *i* |
| 1622 | Les Heaux de Bréhat | 5·51 | 190 | 3·00 | 238 | 1·15 | 105 | 0·09 | 353 | 0·07 | 220 | 0·007 | ⊙ | ⊙ | |
| 1623 | Lezardrieux | 5·89 | 187 | 3·15 | 237 | 1·17 | 094 | 0·10 | 015 | 0·05 | 290 | 0·006 | ⊙ | ⊙ | |

SEASONAL CHANGES IN MEAN LEVEL AND HARMONIC CONSTANTS

| No. | Jan. 1 | Feb. 1 | Mar. 1 | Apr. 1 | May 1 | June 1 | July 1 | Aug. 1 | Sep. 1 | Oct. 1 | Nov. 1 | Dec. 1 | Jan. 1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1386–1409 | | | | | | | Negligible | | | | | | |
| 1412–1437 | +0·1 | +0·1 | 0·0 | 0·0 | 0·0 | 0·0 | −0·1 | −0·1 | −0·1 | 0·0 | 0·0 | +0·1 | +0·1 |
| 1438–1448 | +0·1 | +0·1 | 0·0 | 0·0 | 0·0 | 0·0 | −0·1 | −0·2 | −0·1 | 0·0 | +0·1 | +0·1 | +0·1 |
| 1449–1470 | 0·0 | 0·0 | 0·0 | 0·0 | 0·0 | 0·0 | −0·1 | −0·1 | 0·0 | 0·0 | +0·1 | +0·1 | 0·0 |
| 1471–1489 | 0·0 | 0·0 | −0·1 | −0·1 | −0·1 | −0·1 | 0·0 | 0·0 | 0·0 | +0·1 | +0·1 | +0·1 | 0·0 |
| 1501–1521 | 0·0 | 0·0 | 0·0 | −0·1 | −0·1 | −0·1 | 0·0 | 0·0 | 0·0 | +0·1 | +0·1 | +0·1 | 0·0 |
| 1528–1571 | 0·0 | 0·0 | −0·1 | −0·1 | −0·1 | 0·0 | 0·0 | 0·0 | 0·0 | +0·1 | +0·1 | +0·1 | 0·0 |
| 1572–1581a | 0·0 | −0·1 | −0·1 | −0·1 | 0·0 | 0·0 | 0·0 | 0·0 | +0·1 | +0·1 | 0·0 | 0·0 | 0·0 |
| 1582–1602 | 0·0 | 0·0 | −0·1 | −0·1 | −0·1 | 0·0 | 0·0 | 0·0 | 0·0 | +0·1 | +0·1 | +0·1 | 0·0 |
| 1603–1623 | | | | | | | Negligible | | | | | | |
| 1539 $M_2$ | 2·18 | 2·16 | 2·15 | 2·13 | 2·09 | 2·06 | 2·08 | 2·15 | 2·23 | 2·28 | 2·27 | 2·22 | 2·18 |
| 1582 $M_2$ | 2·65 | 2·64 | 2·64 | 2·65 | 2·65 | 2·64 | 2·60 | 2·56 | 2·55 | 2·58 | 2·62 | 2·64 | 2·65 |

| No. | PLACE | M.L. $Z_0$ m. | HARMONIC CONSTANTS Zone −0100 $M_2$ g° | $M_2$ H.m. | $S_2$ g° | $S_2$ H.m. | $K_1$ g° | $K_1$ H.m. | $O_1$ g° | $O_1$ H.m. | S.W. CORRECTIONS ¼-diurnal $f_4$ | ¼-diurnal $F_4$ | ⅙-diurnal $f_6$ | ⅙-diurnal $F_6$ | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1694 | Pasajes | 2·36 | 121 | 1·31 | 156 | 0·53 | 083 | 0·06 | 348 | 0·07 | 140 | 0·013 | ⊙ | ⊙ | |
| 1700 | Portugalete (Bilbao) | 2·40 | 125 | 1·30 | 157 | 0·50 | 097 | 0·05 | 338 | 0·07 | 190 | 0·009 | ⊙ | ⊙ | |
| 1703 | Santander | 2·29 | 131 | 1·29 | 168 | 0·54 | 093 | 0·07 | 338 | 0·08 | 156 | 0·009 | 294 | 0·007 | |
| 1708 | Gijon | 2·33 | 131 | 1·27 | 153 | 0·45 | 086 | 0·07 | 349 | 0·07 | ⊙ | ⊙ | ⊙ | ⊙ | |
| 1710 | Aviles | 2·21 | 119 | 1·24 | 151 | 0·44 | 095 | 0·08 | 342 | 0·07 | ⊙ | ⊙ | ⊙ | ⊙ | |
| 1716 | El Ferrol del Caudillo | 2·18 | 116 | 1·18 | 138 | 0·40 | 091 | 0·07 | 340 | 0·07 | 051 | 0·009 | ⊙ | ⊙ | |
| 1717 | La Coruna | 2·16 | 112 | 1·16 | 144 | 0·47 | 088 | 0·08 | 342 | 0·06 | ⊙ | ⊙ | ⊙ | ⊙ | |
| 1722 | Villagarcia | 2·05 | 106 | 1·11 | 135 | 0·39 | 056 | 0·09 | 328 | 0·08 | ⊙ | ⊙ | ⊙ | ⊙ | |
| 1723 | Marin | 1·91 | 111 | 1·04 | 140 | 0·38 | 058 | 0·08 | 332 | 0·08 | ⊙ | ⊙ | ⊙ | ⊙ | |
| 1724 | Vigo | 1·96 | 107 | 1·09 | 132 | 0·39 | 074 | 0·08 | 333 | 0·06 | 068 | 0.009 | 214 | 0.007 | |
| | | | | | | | **Zone U.T.(G.M.T.)** | | | | | | | | |
| 1730 | Viana do Castelo | 2·00 | 075 | 1·03 | 105 | 0·37 | 053 | 0·08 | 324 | 0·04 | ⊙ | ⊙ | ⊙ | ⊙ | |
| 1733 | Porto de Leixoes | 2·00 | 074 | 1·04 | 102 | 0·36 | 059 | 0·07 | 315 | 0·06 | ⊙ | ⊙ | ⊙ | ⊙ | |
| 1734 | Rio Douro Entrance | 1·96 | 083 | 0·95 | 109 | 0·34 | 097 | 0·07 | 321 | 0·05 | ⊙ | ⊙ | ⊙ | ⊙ | |
| 1735 | Oporto | 1·96 | 087 | 0·98 | 114 | 0·35 | 079 | 0·08 | 324 | 0·07 | ⊙ | ⊙ | ⊙ | ⊙ | |
| 1736 | Barra de Aveiro | 2·00 | 082 | 0·86 | 111 | 0·32 | 073 | 0·05 | 318 | 0·05 | 114 | 0·063 | ⊙ | ⊙ | |
| 1737 | Figueira da Foz | 2·00 | 078 | 0·94 | 110 | 0·34 | 063 | 0·06 | 324 | 0·05 | ⊙ | ⊙ | ⊙ | ⊙ | |
| 1739 | Peniche | 2·00 | 070 | 1·03 | 097 | 0·36 | 058 | 0·08 | 317 | 0·06 | ⊙ | ⊙ | ⊙ | ⊙ | |
| 1740 | Cascais | 2·08 | 065 | 0·98 | 091 | 0·35 | 054 | 0·07 | 313 | 0·06 | ⊙ | ⊙ | ⊙ | ⊙ | |
| 1741 | **LISBON** | 2·20 | 076 | 1·15 | 106 | 0·40 | 058 | 0·07 | 320 | 0·06 | 104 | 0·055 | ⊙ | ⊙ | |
| 1743 | Sesimbra | 2·00 | 065 | 0·98 | 090 | 0·35 | 055 | 0·07 | 314 | 0·06 | ⊙ | ⊙ | ⊙ | ⊙ | |
| 1744 | Setubal | 2·00 | 070 | 1·00 | 112 | 0·32 | 058 | 0·07 | 320 | 0·07 | ⊙ | ⊙ | ⊙ | ⊙ | |
| 1745 | Porto de Sines | 2·00 | 064 | 0·98 | 090 | 0·36 | 054 | 0·07 | 317 | 0·06 | ⊙ | ⊙ | ⊙ | ⊙ | |
| 1749 | Lagos | 2·00 | 057 | 0·98 | 083 | 0·36 | 048 | 0·07 | 309 | 0·06 | ⊙ | ⊙ | ⊙ | ⊙ | |
| 1752 | Cabo de Santa Maria | 2·00 | 065 | 0·93 | 095 | 0·32 | 054 | 0·06 | 317 | 0·06 | 318 | 0·042 | ⊙ | ⊙ | |
| 1753 | Vila Real de Santo António | 2·00 | 066 | 0·93 | 092 | 0·31 | 072 | 0·08 | 323 | 0·07 | 302 | 0·038 | ⊙ | ⊙ | |
| | | | | | | | **Zone −0100** | | | | | | | | |
| 1753a | Ayamonte | 1·75 | 088 | 1·00 | 118 | 0·32 | 068 | 0·06 | 334 | 0·06 | ⊙ | ⊙ | ⊙ | ⊙ | |
| 1754 | Ria de Huelva Bar | 1·85 | 085 | 1·02 | 112 | 0·38 | 064 | 0·07 | 323 | 0·06 | ⊙ | ⊙ | ⊙ | ⊙ | |
| 1756 | Rio Guadalquivir Bar | 1·88 | 081 | 1·01 | 105 | 0·32 | 048 | 0·06 | 335 | 0·06 | 043 | 0.022 | ⊙ | ⊙ | |
| 1757 | Bonanza | 1·74 | 089 | 0·96 | 115 | 0·30 | 052 | 0·05 | 342 | 0·06 | 304 | 0·029 | ⊙ | ⊙ | |
| 1758 | Corta de los Jerónimos | 1·55 | 160 | 0·82 | 194 | 0·24 | 125 | 0·07 | 019 | 0·11 | 298 | 0·127 | ⊙ | ⊙ | |
| 1759 | Sevilla | 1·32 | 219 | 0·61 | 241 | 0·16 | 157 | 0·03 | 049 | 0·06 | 285 | 0·179 | ⊙ | ⊙ | |
| 1760 | Rota | 1·76 | 081 | 0·99 | 108 | 0·35 | 059 | 0·07 | 317 | 0·07 | 038 | 0·010 | 015 | 0·009 | |
| 1763 | Puerto Cadiz | 1·87 | 084 | 1·03 | 110 | 0·37 | 059 | 0·07 | 316 | 0·07 | 043 | 0·020 | ⊙ | ⊙ | |
| 1764 | La Carraca | 1·92 | 097 | 1·04 | 110 | 0·38 | 059 | 0·07 | 330 | 0·07 | 063 | 0·029 | ⊙ | ⊙ | |
| 1765 | Cabo Trafalgar | 1·4 | 082 | 0·76 | 107 | 0·28 | 074 | 0·03 | 312 | 0·02 | ⊙ | ⊙ | ⊙ | ⊙ | x |
| 1765a | Rio Barbate | 1·26 | 091 | 0·46 | 125 | 0·23 | 092 | 0·03 | 286 | 0·01 | ⊙ | ⊙ | ⊙ | ⊙ | |
| 1766 | Punta Camarinal | 1·2 | 078 | 0·65 | 104 | 0·22 | 090 | 0·04 | 327 | 0·02 | 048 | 0·040 | ⊙ | ⊙ | x |
| 1768 | Tarifa | 0·79 | 070 | 0·41 | 095 | 0·16 | 158 | 0·02 | 169 | 0·01 | 058 | 0·175 | 254 | 0·171 | |
| 1768a | Punta Carnera | 0·6 | 076 | 0·31 | 101 | 0·11 | 160 | 0·02 | 195 | 0·01 | 082 | 0·096 | ⊙ | ⊙ | x |
| 1769 | Algeciras | 0·66 | 073 | 0·32 | 096 | 0·12 | 145 | 0·03 | 163 | 0·01 | 088 | 0·155 | ⊙ | ⊙ | |

SEASONAL CHANGES IN MEAN LEVEL AND HARMONIC CONSTANTS

| No. | | Jan. 1 | Feb. 1 | Mar. 1 | Apr. 1 | May 1 | June 1 | July 1 | Aug. 1 | Sep. 1 | Oct. 1 | Nov. 1 | Dec. 1 | Jan. 1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1625–1643 | | | | | | | | Negligible | | | | | | |
| 1644–1665 | | +0·1 | +0·1 | +0·1 | 0·0 | 0·0 | −0·1 | −0·1 | −0·1 | 0·0 | 0·0 | 0·0 | 0·0 | +0·1 |
| 1666 | | +0·1 | +0·4 | +0·5 | +0·3 | 0·0 | −0·2 | −0·2 | −0·1 | −0·1 | −0·2 | −0·3 | −0·2 | +0·1 |
| 1667 | | +0·1 | +0·8 | +1·0 | +0·6 | 0·0 | −0·3 | −0·3 | −0·1 | −0·2 | −0·5 | −0·7 | −0·5 | +0·1 |
| 1668–1673 | | +0·1 | +0·1 | +0·1 | 0·0 | 0·0 | −0·1 | −0·1 | −0·1 | 0·0 | 0·0 | 0·0 | 0·0 | +0·1 |
| 1674–1681 | | | | | | | | Negligible | | | | | | |
| 1683–1689 | | +0·1 | +0·1 | 0·0 | 0·0 | −0·1 | −0·1 | −0·1 | 0·0 | 0·0 | 0·0 | 0·0 | +0·1 | +0·1 |
| 1690–1698 | | | | | | | | Negligible | | | | | | |
| 1699–1719 | | 0·0 | −0·1 | −0·1 | −0·1 | 0·0 | 0·0 | 0·0 | 0·0 | 0·0 | +0·1 | +0·1 | 0·0 | 0·0 |
| 1720–1769 | | | | | | | | Negligible | | | | | | |
| 1665 | $M_2$ | 1·77 | 1·61 | 1·63 | 1·78 | 1·91 | 1·89 | 1·73 | 1·62 | 1·69 | 1·87 | 2·01 | 1·96 | 1·77 |
| 1666 | $M_2$ | 1·67 | 1·60 | 1·50 | 1·39 | 1·30 | 1·26 | 1·27 | 1·33 | 1·43 | 1·54 | 1·63 | 1·68 | 1·67 |
| 1667 | $M_2$ | 1·51 | 1·43 | 1·30 | 1·16 | 1·04 | 0·99 | 1·01 | 1·09 | 1·22 | 1·36 | 1·48 | 1·53 | 1·51 |

| No. | PLACE | M.L. $Z_0$ m. | HARMONIC CONSTANTS Zone −0100 $M_2$ g° | $M_2$ H.m. | $S_2$ g° | $S_2$ H.m. | $K_1$ g° | $K_1$ H.m. | $O_1$ g° | $O_1$ H.m. | S.W. CORRECTIONS ¼-diurnal $f_4$ | ¼-diurnal $F_4$ | ⅙-diurnal $f_6$ | ⅙-diurnal $F_6$ | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1770 | **GIBRALTAR** | 0·51 | 082 | 0·32 | 111 | 0·12 | 148 | 0·02 | 176 | 0·01 | 076 | 0·188 | 308 | 0.064 | |
| 1770a | Sandy Bay | 0·45 | 075 | 0·27 | 104 | 0·11 | 156 | 0·02 | 173 | 0·01 | 078 | 0·251 | ⊙ | ⊙ | |
| 1773 | Malaga | 0·42 | 085 | 0·18 | 109 | 0·07 | 171 | 0·03 | 140 | 0·02 | ⊙ | ⊙ | ⊙ | ⊙ | |
| 1773a | Almeria | 0·4 | 080 | 0·09 | 108 | 0·04 | 172 | 0·03 | 133 | 0·02 | ⊙ | ⊙ | ⊙ | ⊙ | *x* |
| 1774 | Alicante | 0·4 | 089 | 0·02 | 108 | 0·01 | 178 | 0·04 | 123 | 0·02 | ⊙ | ⊙ | ⊙ | ⊙ | *x* |
| 1780 | Palma de Mallorca | 0·3 | 237 | 0·03 | 253 | 0·01 | 183 | 0·04 | 119 | 0·02 | ⊙ | ⊙ | ⊙ | ⊙ | *x* |
| 1782 | Port Vendres | 0·3 | 317 | 0·05 | 330 | 0·02 | 027 | 0·01 | 341 | 0·01 | ⊙ | ⊙ | ⊙ | ⊙ | *x* |
| 1785 | Marseille | 0·33 | 246 | 0·07 | 266 | 0·02 | 191 | 0·03 | 115 | 0·02 | ⊙ | ⊙ | ⊙ | ⊙ | |
| 1786 | Toulon | 0·41 | 295 | 0·03 | 306 | 0·01 | 038 | 0·01 | 332 | 0·01 | ⊙ | ⊙ | ⊙ | ⊙ | |
| 1789 | Nice | 0·42 | 273 | 0·07 | 284 | 0·03 | 090 | 0·01 | 007 | 0·01 | ⊙ | ⊙ | ⊙ | ⊙ | |
| 1790 | Monte Carlo | 0·43 | 288 | 0·04 | 289 | 0·02 | 027 | 0·01 | — | 0·00 | ⊙ | ⊙ | ⊙ | ⊙ | |
| 1794 | Ajaccio | 0·4 | 279 | 0·07 | 314 | 0·03 | 063 | 0·02 | 319 | 0·01 | ⊙ | ⊙ | ⊙ | ⊙ | *x* |
| 1801 | Cagliari | 0·16 | 265 | 0·08 | 287 | 0·03 | 198 | 0·03 | 114 | 0·02 | ⊙ | ⊙ | ⊙ | ⊙ | |
| 1802 | Carlo Forte | 0·2 | 260 | 0·06 | 284 | 0·03 | 193 | 0·03 | 109 | 0·02 | ⊙ | ⊙ | ⊙ | ⊙ | *x* |
| | | | | | | | **Zone U.T.(G.M.T.)** | | | | | | | | |
| 1809 | Tanger | 1·27 | 067 | 0·68 | 090 | 0·25 | 080 | 0·06 | 327 | 0·05 | 026 | 0·076 | ⊙ | ⊙ | |
| 1809a | Punta Alboassa | 1·0 | 069 | 0·52 | 090 | 0·20 | 088 | 0·05 | 343 | 0·03 | 344 | 0·087 | ⊙ | ⊙ | *x* |
| 1809b | Punta Cires | 0·7 | 046 | 0.36 | 074 | 0·14 | 133 | 0·03 | 081 | 0·01 | 062 | 0·128 | ⊙ | ⊙ | *x* |
| 1810 | Ceuta | 0·57 | 055 | 0·29 | 076 | 0·10 | 148 | 0·04 | 105 | 0·02 | 059 | 0·216 | ⊙ | ⊙ | |
| 1815 | Baie d'al Hoceima | 0·34 | 061 | 0·18 | 085 | 0·07 | 119 | 0·04 | 183 | 0·01 | ⊙ | ⊙ | ⊙ | ⊙ | |
| 1818 | Islas Chafarinas | 0·23 | 100 | 0·12 | 129 | 0·05 | 170 | 0·03 | 091 | 0·01 | ⊙ | ⊙ | ⊙ | ⊙ | |
| | | | | | | | **Zone −0100** | | | | | | | | |
| 1828 | La Goulette | 0·3 | 278 | 0·08 | 304 | 0·03 | 211 | 0·03 | 130 | 0·01 | ⊙ | ⊙ | ⊙ | ⊙ | *x* |
| 1832a | El Abassia | 0·63 | 112 | 0·26 | 138 | 0·14 | 041 | 0·02 | 092 | 0·01 | 313 | 0·467 | ⊙ | ⊙ | |
| 1834 | Sfax | 0·99 | 106 | 0·42 | 134 | 0·27 | 019 | 0·02 | 095 | 0·01 | ⊙ | ⊙ | ⊙ | ⊙ | |
| 1836 | Gabes | 1·19 | 108 | 0·51 | 137 | 0·36 | 004 | 0·03 | 095 | 0·01 | ⊙ | ⊙ | ⊙ | ⊙ | |
| 1838 | Houmt Adjim | 0·64 | 132 | 0·31 | 159 | 0·20 | 050 | 0·01 | 114 | 0·01 | ⊙ | ⊙ | ⊙ | ⊙ | |
| 1840 | Houmt Souk | 1·14 | 133 | 0·31 | 165 | 0·20 | 009 | 0·02 | 089 | 0·02 | 298 | 0·425 | ⊙ | ⊙ | |
| 1841 | Ras Tourg-en-Ness | 0·99 | 098 | 0·27 | 129 | 0·17 | 041 | 0·02 | 098 | 0·01 | ⊙ | ⊙ | ⊙ | ⊙ | |
| 1842 | Zarzis | 0·63 | 106 | 0·22 | 133 | 0·15 | 046 | 0·02 | 116 | 0·01 | ⊙ | ⊙ | ⊙ | ⊙ | |
| 1850 | Imperia | 0·15 | 266 | 0·08 | 284 | 0·03 | 206 | 0·04 | 123 | 0·02 | ⊙ | ⊙ | ⊙ | ⊙ | |
| 1851 | Genova (Genoa) | 0·15 | 251 | 0·08 | 268 | 0·03 | 201 | 0·04 | 118 | 0·02 | ⊙ | ⊙ | ⊙ | ⊙ | |
| 1851a | La Spezia | 0·20 | 244 | 0·09 | 267 | 0·03 | 198 | 0·04 | 116 | 0·01 | ⊙ | ⊙ | ⊙ | ⊙ | |
| 1852 | Livorno (Leghorn) | 0·17 | 261 | 0·08 | 278 | 0·03 | 193 | 0·04 | 111 | 0·02 | ⊙ | ⊙ | ⊙ | ⊙ | |
| 1853 | Civitavecchia | 0·20 | 268 | 0·11 | 289 | 0·04 | 207 | 0·03 | 118 | 0·01 | ⊙ | ⊙ | ⊙ | ⊙ | |
| 1854 | Gaeta | 0·15 | 263 | 0·11 | 289 | 0·04 | 202 | 0·03 | 324 | 0·01 | ⊙ | ⊙ | ⊙ | ⊙ | |
| 1855 | Napoli (Naples) | 0·20 | 266 | 0·11 | 287 | 0·04 | 219 | 0·03 | 125 | 0·01 | ⊙ | ⊙ | ⊙ | ⊙ | |
| 1856 | Ischia | 0·16 | 261 | 0·12 | 282 | 0·05 | 207 | 0·03 | 120 | 0·01 | ⊙ | ⊙ | ⊙ | ⊙ | |
| 1857 | Tropea | 0·20 | 271 | 0·15 | 294 | 0·05 | 218 | 0·04 | 158 | 0·01 | ⊙ | ⊙ | ⊙ | ⊙ | |
| 1860 | Villa San Giovanni | 0·12 | 114 | 0·03 | 103 | 0·01 | 047 | 0·01 | — | 0·00 | ⊙ | ⊙ | ⊙ | ⊙ | *x* |
| 1861 | Reggio Calabria | 0·12 | 091 | 0·06 | 098 | 0·03 | 059 | 0·01 | 054 | 0·01 | ⊙ | ⊙ | ⊙ | ⊙ | |
| 1862 | Taormina | 0·12 | 086 | 0·09 | 088 | 0·04 | 101 | 0·03 | 049 | 0·01 | ⊙ | ⊙ | ⊙ | ⊙ | *x* |
| 1863 | Messina | 0·12 | 031 | 0·05 | 056 | 0·03 | 290 | 0·01 | 065 | 0·01 | ⊙ | ⊙ | ⊙ | ⊙ | |
| 1864 | Capo Peloro | 0·20 | 267 | 0·05 | 313 | 0·03 | 231 | 0·02 | 249 | 0·01 | ⊙ | ⊙ | ⊙ | ⊙ | |
| 1865 | Lipari | 0·20 | 261 | 0·12 | 284 | 0·04 | 214 | 0·03 | 125 | 0·01 | ⊙ | ⊙ | ⊙ | ⊙ | |
| 1866 | Milazzo | 0·20 | 263 | 0·12 | 282 | 0·05 | 215 | 0·03 | 130 | 0·01 | ⊙ | ⊙ | ⊙ | ⊙ | |
| 1867 | Palermo | 0·21 | 261 | 0·11 | 283 | 0·04 | 208 | 0·03 | 126 | 0·01 | ⊙ | ⊙ | ⊙ | ⊙ | |
| 1868 | Marsala | 0·15 | 236 | 0·07 | 247 | 0·02 | 148 | 0·04 | 109 | 0·02 | ⊙ | ⊙ | ⊙ | ⊙ | |

⊙ No data.
*l* Constants from 15 days' observations.
*x* M.L. inferred.

# PART IIIa

## HARMONIC CONSTANTS FOR TIDAL STREAMS

The Simplified Harmonic Method N.P.159 (or a calculator method based on this, see pages xxvi to xxviii) may be used for the prediction of Tidal Streams, using the constituents given in Part IIIa. The method used is exactly the same as for tides with the following analogies:—

| TIDES | TIDAL STREAMS |
|---|---|
| Mean Level. | Current. |
| Heights. | Rates. |
| Metres. | Knots. |

In most cases, constants are given for one direction only and the Tidal Streams may be considered to be rectilinear. In these cases, the predictions will give positive and negative values for the rates which are in the directions shown.

In some cases, the direction as well as the rate of the Tidal Stream changes and in these cases the stream can only be defined adequately by two sets of constituents in direction at right angles to one another, usually North and East. In such cases, both curves must be prepared and the actual rate and direction at any time be obtained from the vector sum of the two results at this time. When using the calculator method hourly rates can be calculated for each component, these being combined in pairs to give hourly rates and directions.

Whereas tidal levels may only change slowly over several miles, Tidal Streams, particularly in enclosed waters, can have large changes, in both rate and direction, over quite small distances. The exact position for which the constituents are given should therefore be noted carefully when predicting.

*Note:* The numbers used in Part IIIa are the first three digits of the port numbers in the same area.

| No. | Lat. N. | Long. E. | Dir$^{n}$. (+) | (−) | HARMONIC CONSTANTS Zone −0100 $Z_0$ Kn. | $M_2$ g° | $M_2$ H.Kn. | $S_2$ g° | $S_2$ H.Kn. | $K_1$ g° | $K_1$ H.Kn. | $O_1$ g° | $O_1$ H.Kn. | S.W. CORRECTIONS ¼-diurnal $f_4$ | ¼-diurnal $F_4$ | ⅙-diurnal $f_6$ | ⅙-diurnal $F_6$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Straits of Messina* | | | | | | | | | | | | | | | | | |
| 186 | ~~38 15·0~~ | 15 37·0 | ~~070~~ | 250 | −0·17 | 129 | 2·6 | 147 | 0·7 | 073 | 0·7 | 056 | 0·3 | 184 | 0·021 | ⊙ | ⊙ |
| 186a | 38 14·0 | ~~15 38·0~~ | 060 | 240 | −0·70 | 129 | 3·2 | 147 | 0·9 | 073 | 0·8 | 056 | 0·4 | 184 | 0·021 | ⊙ | ⊙ |
| *Venezia* | | | | | | | | | | | | | | | | | |
| 189 | 45 25·4 | 12 25·6 | 300 | 120 | 0·00 | 231 | 0·96 | 240 | 0·57 | 014 | 0·45 | 004 | 0·12 | ⊙ | ⊙ | ⊙ | ⊙ |
| 189a | 45 20·0 | 12 20·0 | 285 | 105 | 0·00 | 200 | 1·27 | 209 | 0·76 | 350 | 0·55 | 342 | 0·15 | ⊙ | ⊙ | ⊙ | ⊙ |

⊙ No data.

# GEOGRAPHICAL INDEX