

**AN ACCOUNT  
OF THE METHOD OF CALCULATING  
THE YEAR BOOK OF THE FUNDAMENTAL  
HARMONIC TIDES**

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for the years 1940 to 1944**

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by

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One concept of the tide, as old as it is simple, assigns to the high water at a given place a *constant retardation* after the transit of the moon on the local meridian; a retardation commonly called by pilots the "establishment of the port".

The harmonic method substitutes for this rather over simplified method of the single establishment a summation of the partial tides or constituent waves due to a certain number of fictitious bodies, of which the effects, in each locality, retain however the same very simple harmonic type and give rise, after an analysis of several observations of the local tide, to as many partial "establishments" as there have been envisaged partial waves or constituents.

We call these "establishments" constant and specific for each constituent wave for the given locality, their "harmonic establishment".

This "*harmonic establishment*" is expressed, for each constituent tide, as I have shown in various articles in the Hydrographic Review (\*) by means of one of the harmonic Constants extracted from the List, such as those given in Special Publication N° 26 of the International Hydrographic Bureau (1931-1942). It is equal to  $\frac{g^0}{n}$ , a fraction in which  $g^0$  represents the phase-lag of the tide expressed in degrees with respect to the international and conventional meridian of Greenwich;  $n$  being the angular speed of the wave expressed in degrees.

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(\*) See : "Hydrographic Review"

Vol. XIV, N° 2, November 1937, pages 53-59.

Vol. XVI, N° 1, May 1939, pages 59-63.

Vol. XVII, N° 1, May 1940, pages 139-159.

Otherwise stated,  $\frac{g^0}{n}$  represents, *in current hours*, the constant retardation of the high water of the specific constituent after the transit of the fictitious body motivating the tide (See addendum N° 5 and the Preface December 1940 of the Special Publication N° 26 of the International Hydrographic Bureau, pages 3-7) this retardation being expressed in *legal* or standard time.

“The Harmonic establishments” in legal time or standard time being furnished, or being readily deduced from the important data given for more than 2200 ports and stations in the Special Publication N° 26 of the International Hydrographic Bureau, the predictions of the tides are considerably simplified by the use of the *Calendar of the Fundamental Harmonic Tides* which we have published in these Reviews since the year 1940, for those principal harmonic constituents which there is reason to believe will be needed in practice.

This Calendar limited to the ten fundamental constituents  $M_2$ ,  $S_2$ ,  $N_2$ ,  $K_2$ ,  $K_1$ ,  $O_1$ ,  $P_1$ ,  $Q_1$ ,  $M_4$  and  $MS_4$ , gives, in the form of monthly tables, for each day of the year, the hour  $T_m$  at which the potential is a maximum at Greenwich for each of these ten constituents. This time of Potential (or static) High Water is calculated by the well-known formula:—

$$T_m = \frac{360^\circ - (V_0 + u)}{n^\circ} + k \frac{360^\circ}{n'}$$

in which  $k = 1, 2, 3, \text{ etc... } p$ .

In this Calendar we have given for each day only one of the times of High Water of the semi-diurnal or quarter-diurnal constituents. The other, or the others, are deduced by addition or subtraction of the period shown below for the various constituents.

$M_2$	12 h. 25 m.	$K_1$	23 h. 56 m.	$M_4$	6 h. 13 m.
$S_2$	12 h. 00 m.	$O_1$	25 h. 49 m.	$MS_4$	6 h. 06 m.
$N_2$	12 h. 39 m.	$P_1$	24 h. 04 m.		
$K_2$	11 h. 58 m.	$Q_1$	26 h. 52 m.		

In order to obtain the time of effective High Water for each of the constituent tides, at the given locality, and expressed in the customary time of the place; it suffices to add to the time  $T_m$ , obtained from the calendar for the day in question and for the required constituent, its specific harmonic establishment  $\frac{g^0}{n}$  for that place.

This establishment,  $\frac{g}{n}$  hours, is readily deduced from the harmonic constant  $g$ , generally furnished by the lists or the tables in degrees of arc, by the aid of permanent conversion table giving for each constituent the quantity

$\frac{g}{n}$  hours. This permanent conversion Table was published in the "Hydrographic Review" vol. XVII, N° 1 of May 1940, pages 154 to 159.

The various Calendars of the Harmonic Tides which we have published successively for the years 1940, 1941, 1942, 1943 and 1944 were established in the following manner :—

The values of the arguments  $\frac{360^\circ - (V_0 + u)}{n}$  for the 1st of January and for the 1st of each succeeding month have been deduced from the Tables I and III given on pages 60 & 61 of the Hydrographic Review, Vol. XVI, N° 1 of May 1939 and which served as the initial basic figure for the calculations for each month.

From one day to the next  $T_m$  was augmented, in each of the columns relating to the various constituent waves by the following daily increases :—

$M_2$	$S_2$	$N_2$	$K_2$
+ 50 m. 48	+ 0 m. 00	+ 1 h. 18 m. 99	— 3 m. 93
$K_1$	$O_1$	$P_1$	$Q_1$
— 3 m. 93	+ 1 h. 49 m. 16	+ 3 m. 95	+ 2 h. 52 m. 05
	$M_1$	$MS_1$	
	+ 50 m. 48	+ 24 m. 80	

On the other hand care must be taken, in adding these successive daily increases to deduct from the sum, when it has exceeded it, the figure corresponding to the periods as they are indicated above.

The tables I, II and III, being based on the mean value of the terms in  $u$  of the potential on the 2nd of July for each year, must be utilised for each year up to the 32 of December inclusive, in order to insure, after correction of the arguments, the continuity of the predictions from one year to the next.

The Calendar published for the year 1940, having been calculated *without corrections* to the arguments and being strictly periodic from one day to the next, we can deduce from this Calendar, by simply re-copying from the columns for each constituent, the natural normal sequence of High Waters for a given constituent for a future time, and operating by simple differences, amounting to only a few minutes, one can transfer the data from one fraction of a month to another for the succeeding year; this greatly facilitates the establishment of the Calendar for the subsequent years.

However, for the Calendar published for the years subsequent to the year 1941, account has been taken in our publications of the variation in the course of the year of the slowly variable terms (terms in  $u$ ) of the potential of the constituents  $K_2$ ,  $K_1$ ,  $O_1$  and  $Q_1$  (\*). This correction effects,

(\*) See : "Hydrographic Review", Vol. XVIII, N° 1, May 1941, page 76.

by never more than 8 to 9 minutes at the most, the time of High Water of the constituent, and it varies in value according to the position of the Ascending Node of the Moon in celestial longitude, that is, from one year to another. Consequently, the Calendars published since the year 1941, which contain this correction to the arguments cannot be used, arithmetically speaking, for the deductions relating to the subsequent years as may be done for the year 1940.

If one does not possess this Calendar; it suffices to note that the time of High Water for the constituent M<sub>2</sub> recurs, within a few minutes, at the same hour every 59 days;

That of N <sub>2</sub> every .....	48 days;
» O <sub>1</sub> » .....	71 »
» Q <sub>1</sub> » .....	103 »
» M <sub>4</sub> » .....	37 »
» MS <sub>4</sub> » .....	59 »

The tables below give, during each of these periods, the sequence of the specific High Waters for each constituent on the assumption that, on the 1st day of the period, High Water will occur at 0 h. 00 m. They therefore permit us to interpolate directly, by constant differences amounting only to several minutes, the sequence of the times of potential High Water for each constituent starting with the initial basic figures for each month or fraction of month to which the corrections for the slowly varying part of the potential have already been applied.

For the constituent S<sub>2</sub> the partial tide recurs at the same hour every day.

For the constituents K<sub>2</sub> and K<sub>1</sub> the potential High Water is retarded by 4 minutes every day.

For the constituent P<sub>1</sub> it advances by 4 minutes every day.

M <sub>2</sub>				N <sub>2</sub>			
00.00	00.12	00.24	00.36	00.00	00.31	00.14	00.45
00.50	01.03	01.15	01.27	01.19	01.50	01.02	01.33
01.41	01.53	02.05	02.17	02.38	03.09	02.21	02.52
02.31	02.44	02.56	03.08	03.57	04.28	03.40	04.11
03.22	03.34	03.46	03.58	05.16	05.47	04.59	05.30
04.12	04.25	04.37	04.49	06.35	07.06	06.18	06.49
05.03	05.15	05.27	05.39	07.54	08.25	07.37	08.08
05.53	06.06	06.18	06.30	09.13	09.44	08.56	09.27
06.44	06.56	07.08	07.20	10.32	11.03	10.15	10.46
07.34	07.47	07.59	08.11	11.51	12.22	11.34	12.05
08.25	08.37	08.49	09.01				
09.15	09.27	09.39	09.52				
10.06	10.18	10.30	10.42				
10.56	11.08	11.30	11.32				
11.47	11.59	12.11	12.23				

O<sub>1</sub>

00.00			00.46	00.25
<u>01.49</u>	01.28	<u>01.07</u>	02.35	02.14
03.38	03.17	<u>02.56</u>	04.24	<u>04.03</u>
05.27	<u>05.07</u>	<u>04.45</u>	06.13	<u>05.52</u>
07.17	<u>06.56</u>	06.34	08.02	07.42
<u>09.06</u>	08.45	08.24	<u>09.51</u>	09.31
<u>10.55</u>	10.34	10.13	11.41	11.21
12.44	12.23	<u>12.02</u>	13.30	<u>13.10</u>
14.33	14.12	<u>13.51</u>	15.29	<u>15.00</u>
16.22	<u>16.01</u>	15.40	<u>17.08</u>	16.19
18.12	<u>17.51</u>	17.29	<u>18.57</u>	18.38
<u>20.01</u>	19.40	19.19	20.47	20.27
<u>21.50</u>	21.29	<u>21.08</u>	22.36	22.16
<u>23.39</u>	23.18	<u>22.57</u>	24.25	<u>24.05</u>
25.28	<u>25.07</u>	24.46		00.05

Q<sub>1</sub>

00.00		00.45			00.26			00.09		00.54
<u>02.52</u>	01.49	03.37	02.33	01.30	03.18	02.14	01.12	<u>03.01</u>	01.57	<u>03.47</u>
05.44	04.41	06.29	05.25	04.22	<u>06.10</u>	<u>05.07</u>	04.04	05.53	04.49	06.39
08.36	07.33	09.21	08.17	<u>07.14</u>	<u>09.02</u>	<u>07.59</u>	<u>06.46</u>	08.45	07.42	09.31
11.28	10.25	12.13	11.10	<u>10.06</u>	<u>11.54</u>	10.51	09.48	11.37	10.54	12.23
14.20	13.17	<u>15.05</u>	<u>14.02</u>	<u>12.58</u>	14.46	13.43	12.40	14.29	13.26	15.15
17.13	<u>16.09</u>	<u>17.57</u>	<u>16.54</u>	15.50	17.38	16.35	15.32	17.21	16.18	18.07
<u>20.05</u>	<u>19.01</u>	20.49	19.46	18.42	20.30	19.27	18.25	20.13	19.10	<u>20.59</u>
<u>22.57</u>	<u>21.53</u>	23.41	22.38	21.34	23.22	22.20	21.17	<u>23.05</u>	<u>22.02</u>	<u>23.51</u>
25.49	24.45	26.33	25.30	24.26	26.14	25.12	24.09	<u>25.57</u>	<u>24.54</u>	26.43

M<sub>4</sub>

MS<sub>4</sub>

00.00		00.12			<u>00.00</u>	00.06	00.12	00.18
00.50	00.31	01.03	00.43	00.24	00.25	00.31	00.37	00.43
01.41	<u>01.22</u>	01.53	01.34	01.15	00.50	00.56	<u>01.02</u>	01.08
02.31	02.12	02.44	02.24	02.05	01.15	01.21	01.27	01.33
03.22	03.03	03.34	03.15	02.56	01.40	01.45	01.52	01.57
04.12	03.53	04.25	04.05	03.46	02.04	02.10	02.16	02.22
05.03	04.44	05.15	04.56	04.37	02.29	02.35	02.41	02.47
05.53	05.34	06.06	05.46	05.27	02.54	<u>03.00</u>	03.06	03.12
				00.05	03.19	03.25	03.31	03.36
					03.44	03.50	03.56	<u>04.01</u>
					04.08	04.15	04.20	<u>04.26</u>
					04.33	04.39	04.45	04.51
					<u>04.58</u>	05.04	05.10	05.16
					05.23	05.29	05.35	05.40
					05.48	05.54	<u>06.00</u>	06.05

We reproduce hereafter the 12 monthly tables constituting the Calendar for the Fundamental Harmonic Tides of the Year 1944.

The following are the amplitude factors relating to the year 1944.

<u>Onde</u>	<u>M<sub>2</sub></u>	<u>S<sub>2</sub></u>	<u>N<sub>2</sub></u>	<u>K<sub>2</sub></u>	<u>K<sub>1</sub></u>	<u>O<sub>1</sub></u>	<u>P<sub>1</sub></u>	<u>Q<sub>1</sub></u>	<u>M<sub>1</sub></u>	<u>MS<sub>1</sub></u>
Facteur	1.02	1.00	1.02	0.88	0.96	0.93	1.00	0.93	1.04	1.02
				<u>S<sub>a</sub></u>	<u>S<sub>m</sub></u>					
				1.00	1.00					

H. B.

HEURES DES PLEINES MERS POTENTIELLES A GREENWICH  
TIMES OF POTENTIAL HIGH WATERS AT GREENWICH  
FEBVIER 1944

	M <sub>2</sub>	S <sub>2</sub>	N <sub>2</sub>	K <sub>2</sub>	K <sub>1</sub>	O <sub>1</sub>	P <sub>1</sub>	Q <sub>1</sub>	M.	M.S.
1	05.35	12.00	07.52	03.48	21.47	13.40	02.40	18.50	05.36	02.44
2	06.26	12.00	09.11	03.44	21.43	15.29	02.44	21.42	00.15	03.09
3	07.16	12.00	10.30	03.40	21.39	17.18	02.48	24.34	01.06	03.33
4	08.07	12.00	11.49	03.36	21.35	19.07	02.52	00.34	01.36	03.58
5	08.57	12.00	00.28	03.32	21.31	20.57	02.56	03.26	02.47	04.23
6	09.48	12.00	01.47	03.28	21.27	22.46	03.00	06.18	03.37	04.47
7	10.38	12.00	03.06	03.24	21.23	24.35	03.04	09.10	04.28	05.14
8	11.29	12.00	04.25	03.20	21.19	00.35	03.08	12.02	05.18	05.38
9	12.19	12.00	05.44	03.16	21.15	02.24	03.12	14.54	06.07	05.03
10	00.45	12.00	07.03	03.12	21.11	04.13	03.16	17.46	00.44	00.21
11	01.35	12.00	08.22	03.09	21.07	06.01	03.20	20.37	01.34	00.46
12	02.25	12.00	09.41	03.05	21.04	07.51	03.24	23.29	02.24	01.11
13	03.16	12.00	11.00	03.01	21.00	09.40	03.28	26.22	03.15	01.36
14	04.06	12.00	12.19	02.57	20.56	11.29	03.32	02.22	04.05	02.01
15	04.57	12.00	00.59	02.53	20.52	13.18	03.36	05.14	04.56	02.25
16	05.47	12.00	02.18	02.50	20.48	15.08	03.40	08.06	05.46	02.50
17	06.38	12.00	03.37	02.46	20.44	16.56	03.44	10.58	00.24	03.15
18	07.28	12.00	04.56	02.42	20.40	18.45	03.48	13.50	01.15	03.40
19	08.19	12.00	06.15	02.38	20.36	20.34	03.52	16.42	02.05	04.05
20	09.09	12.00	07.34	02.34	20.33	22.23	03.56	19.34	02.56	04.30
21	10.00	12.00	08.53	02.30	20.29	24.12	04.00	22.26	03.46	04.55
22	10.50	12.00	10.12	02.26	20.25	00.12	04.03	25.18	04.37	05.20
23	11.41	12.00	11.31	02.22	20.21	02.01	04.07	01.18	05.27	05.45
24	00.06	12.00	00.11	02.18	20.17	03.51	04.11	04.10	00.05	00.03
25	00.56	12.00	01.30	02.14	20.13	05.40	04.15	07.02	00.55	00.28
26	01.47	12.00	02.49	02.11	20.09	07.29	04.19	09.54	01.46	00.53
27	02.37	12.00	04.08	02.07	20.05	09.18	04.23	12.46	02.36	01.18
28	03.28	12.00	05.27	02.03	20.01	11.07	04.27	15.38	03.27	01.43
29	04.18	12.00	06.46	01.59	19.57	12.56	04.31	18.30	04.17	02.07

HEURES DES PLEINES MERS POTENTIELLES A GREENWICH  
TIMES OF POTENTIAL HIGH WATERS AT GREENWICH  
JANVIER 1944

	M <sub>2</sub>	S <sub>2</sub>	N <sub>2</sub>	K <sub>2</sub>	K <sub>1</sub>	O <sub>1</sub>	P <sub>1</sub>	Q <sub>1</sub>	M.	M.S.
1	04.21	12.00	05.02	05.50	23.49	08.54	00.38	10.32	04.22	02.08
2	05.11	12.00	06.21	05.46	23.45	10.44	00.42	13.24	05.11	02.33
3	06.02	12.00	07.40	05.42	23.41	12.53	00.46	16.16	06.01	02.58
4	06.52	12.00	08.59	05.38	23.37	14.22	00.50	19.08	00.39	03.23
5	07.43	12.00	10.18	05.34	23.33	16.11	00.54	22.00	01.30	03.47
6	08.33	12.00	11.37	05.31	23.29	18.00	00.58	24.52	02.20	04.12
7	09.24	12.00	00.17	05.27	23.25	19.49	01.02	00.92	03.11	04.37
8	10.14	12.00	01.36	05.23	23.21	21.38	01.06	03.44	04.01	05.02
9	11.05	12.00	02.55	05.19	23.18	23.27	01.10	06.37	04.51	05.27
10	11.55	12.00	04.14	05.15	23.14	25.17	01.14	09.30	05.42	05.52
11	00.21	12.00	05.33	05.11	23.10	01.17	01.17	12.21	00.20	00.10
12	01.11	12.00	06.52	05.07	23.06	03.06	01.21	15.13	01.10	00.35
13	02.02	12.00	08.11	05.03	23.02	04.55	01.25	18.05	02.01	01.00
14	02.52	12.00	09.30	04.99	22.58	06.44	01.29	20.57	02.51	01.25
15	03.42	12.00	10.49	04.95	22.54	08.33	01.33	23.49	03.41	01.49
16	04.33	12.00	12.08	04.91	22.50	10.23	01.37	26.42	04.32	02.14
17	05.23	12.00	00.47	04.88	22.46	12.12	01.41	02.42	05.22	02.39
18	06.14	12.00	02.06	04.84	22.42	14.01	01.45	05.34	00.02	03.04
19	07.04	12.00	03.25	04.80	22.38	15.50	01.49	08.26	00.52	03.29
20	07.55	12.00	04.44	04.76	22.35	17.39	01.53	11.18	01.42	03.53
21	08.45	12.00	06.03	04.72	22.31	19.28	01.56	14.10	02.33	04.17
22	09.36	12.00	07.22	04.28	22.27	21.17	02.00	17.02	03.23	04.42
23	10.26	12.00	08.41	04.24	22.23	23.07	02.04	19.54	04.14	05.07
24	11.17	12.00	10.00	04.20	22.19	24.56	02.08	22.47	05.04	05.32
25	12.07	12.00	11.19	04.16	22.15	00.56	02.12	25.39	05.55	05.56
26	00.33	12.00	12.38	04.12	22.11	02.45	02.16	01.39	00.34	00.15
27	01.23	12.00	01.18	04.08	22.07	04.34	02.20	04.31	01.24	00.40
28	02.13	12.00	02.37	04.04	22.03	06.23	02.24	07.23	02.14	01.05
29	03.04	12.00	03.56	04.00	21.59	08.12	02.28	10.15	03.05	01.29
30	03.54	12.00	05.15	03.56	21.55	10.02	02.32	13.07	03.55	01.54
31	04.45	12.00	06.34	03.52	21.51	11.51	02.36	15.59	04.46	02.19

TABLE 1m

TABLE 1m

HEURES DES PLEINES MERS POTENTIELLES A GREENWICH  
TIMES OF POTENTIAL HIGH WATERS AT GREENWICH  
AVRIL 1944  
TABLE Tm

	M <sub>2</sub>	S <sub>2</sub>	N <sub>2</sub>	K <sub>2</sub>	K <sub>1</sub>	O <sub>1</sub>	P <sub>1</sub>	Q <sub>1</sub>	M.	MS.
1	06.22	12.00	10.55	11.51	17.51	19.31	06.38	02.51	00.11	03.07
2	07.13	12.00	12.14	11.47	17.47	21.20	06.42	05.43	01.01	03.32
3	08.03	12.00	00.54	11.43	17.43	23.09	06.46	08.35	01.51	03.56
4	08.54	12.00	02.13	11.39	17.39	24.58	06.50	11.28	02.42	04.21
5	09.44	12.00	03.32	11.35	17.35	00.56	06.54	14.22	03.32	04.46
6	10.35	12.00	04.51	11.32	17.31	02.47	06.58	17.12	04.23	05.11
7	11.25	12.00	06.10	11.28	17.27	04.35	07.02	20.04	05.13	05.37
8	12.16	12.00	07.29	11.24	17.23	06.25	07.06	22.56	06.04	06.02
9	00.41	12.00	08.48	11.20	17.19	08.15	07.10	25.49	00.42	00.20
10	01.31	12.00	10.07	11.16	17.15	10.04	07.14	01.49	01.32	00.45
11	02.22	12.00	11.26	11.12	17.11	11.53	07.17	04.41	02.22	01.10
12	03.12	12.00	00.06	11.08	17.07	13.42	07.21	07.33	03.12	01.34
13	04.03	12.00	01.25	11.04	17.04	15.31	07.25	10.25	04.03	01.59
14	04.53	12.00	02.44	11.00	17.00	17.20	07.29	13.18	04.53	02.24
15	05.44	12.00	04.03	10.56	16.56	19.10	07.33	16.04	05.44	02.49
16	06.34	12.00	05.22	10.53	16.53	20.58	07.37	19.01	00.22	03.14
17	07.25	12.00	06.41	10.50	16.49	22.47	07.41	21.53	01.12	03.38
18	08.15	12.00	08.00	10.46	16.45	24.36	07.45	24.45	02.03	04.04
19	09.06	12.00	09.19	10.42	16.41	00.36	07.49	00.45	02.53	04.29
20	09.56	12.00	10.38	10.38	16.37	02.25	07.53	03.38	03.44	04.54
21	10.47	12.00	11.57	10.34	16.33	04.14	07.56	06.30	04.34	05.19
22	11.37	12.00	00.37	10.30	16.29	06.04	08.00	09.22	05.25	05.43
23	00.02	12.00	01.56	10.26	16.25	07.53	08.04	12.14	00.03	00.02
24	00.53	12.00	03.15	10.22	16.21	09.42	08.08	15.06	00.54	00.27
25	01.43	12.00	04.34	10.18	16.17	11.31	08.12	17.59	01.44	00.52
26	02.34	12.00	05.53	10.14	16.13	13.20	08.16	20.51	02.35	01.16
27	03.24	12.00	07.12	10.10	16.09	15.09	08.20	23.43	03.25	01.41
28	04.15	12.00	08.31	10.06	16.05	16.59	08.24	26.35	04.16	02.06
29	05.05	12.00	09.50	10.02	16.01	18.48	08.28	02.35	05.06	02.31
30	05.56	12.00	11.09	09.58	15.57	20.37	08.32	05.26	05.57	02.56

HEURES DES PLEINES MERS POTENTIELLES A GREENWICH  
TIMES OF POTENTIAL HIGH WATERS AT GREENWICH  
MARS 1944  
TABLE Tm

	M <sub>2</sub>	S <sub>2</sub>	N <sub>2</sub>	K <sub>2</sub>	K <sub>1</sub>	O <sub>1</sub>	P <sub>1</sub>	Q <sub>1</sub>	M.	MS.
1	03.08	12.00	08.05	01.53	19.53	14.46	04.35	21.25	05.09	02.32
2	03.58	12.00	09.24	01.51	19.49	16.35	04.39	24.15	05.59	02.57
3	06.49	12.00	10.43	01.47	19.45	18.24	04.43	00.15	00.37	03.22
4	07.39	12.00	12.02	01.43	19.41	20.13	04.47	03.07	01.28	03.47
5	08.30	12.00	00.42	01.39	19.37	22.02	04.51	05.59	02.18	04.12
6	09.20	12.00	02.01	01.35	19.33	23.51	04.55	08.51	03.08	04.36
7	10.11	12.00	03.20	01.31	19.29	25.41	04.59	11.43	03.59	05.00
8	11.02	12.00	04.39	01.27	19.25	01.41	05.03	14.35	04.49	05.25
9	11.52	12.00	05.59	01.23	19.22	03.30	05.07	17.27	05.39	05.50
10	00.17	12.00	07.18	01.19	19.18	05.19	05.11	20.20	00.17	00.08
11	01.07	12.00	08.37	01.16	19.14	07.08	05.15	23.12	01.07	00.33
12	01.58	12.00	09.56	01.12	19.10	08.57	05.19	26.04	01.58	00.58
13	02.48	12.00	11.14	01.08	19.06	10.46	05.23	02.04	02.48	01.23
14	03.39	12.00	12.33	01.04	19.02	12.36	05.27	04.56	03.39	01.48
15	04.29	12.00	01.13	01.00	18.58	14.25	05.31	07.48	04.29	02.12
16	05.20	12.00	02.32	00.96	18.54	16.13	05.35	10.40	05.20	02.37
17	06.10	12.00	03.51	00.92	18.50	18.02	05.38	13.33	06.10	03.02
18	07.01	12.00	05.10	00.88	18.47	19.52	05.42	16.25	00.48	03.27
19	07.51	12.00	06.29	00.84	18.43	21.41	05.46	19.17	01.39	03.52
20	08.42	12.00	07.47	00.80	18.39	23.29	05.50	22.09	02.29	04.16
21	09.32	12.00	09.06	00.76	18.35	25.18	05.54	25.01	03.20	04.41
22	10.23	12.00	10.25	00.72	18.31	01.18	05.58	01.01	04.11	05.06
23	11.13	12.00	11.44	00.69	18.27	03.07	06.02	03.53	05.01	05.30
24	12.04	12.00	00.23	00.65	18.23	04.56	06.06	06.45	05.52	05.55
25	00.29	12.00	01.42	00.61	18.19	06.45	06.10	09.38	00.30	00.13
26	01.19	12.00	03.01	00.57	18.15	08.35	06.14	12.30	01.20	00.38
27	02.10	12.00	04.20	00.53	18.11	10.25	06.18	15.22	02.11	01.03
28	03.00	12.00	05.39	00.49	18.07	12.14	06.22	18.14	03.01	01.28
29	03.51	12.00	06.58	00.45	18.03	14.03	06.26	21.06	03.52	01.52
30	04.41	12.00	08.17	00.41	17.59	15.52	06.30	23.58	04.42	02.17
31	05.32	12.00	09.36	11.55	17.55	17.41	06.34	26.51	05.33	02.42



HEURES DES PLEINES MERS POTENTIELLES A GREENWICH  
TIMES OF POTENTIAL HIGH WATERS AT GREENWICH  
TABLE Tm  
JUN 1944

	M <sub>2</sub>	S <sub>2</sub>	N <sub>2</sub>	K <sub>2</sub>	K <sub>1</sub>	O <sub>1</sub>	P <sub>1</sub>	Q <sub>1</sub>	M.	M.S.
1	08.00	12.00	02.38	07.54	13.54	01.24	10.39	16.34	01.48	03.56
2	08.50	12.00	03.57	07.50	13.50	03.13	10.43	19.26	02.38	04.20
3	09.40	12.00	05.16	07.46	13.46	05.03	10.47	22.18	03.29	04.45
4	10.31	12.00	06.35	07.42	13.42	06.52	10.51	25.10	04.19	05.10
5	11.21	12.00	07.54	07.38	13.38	08.41	10.55	01.10	05.10	05.35
6	12.12	12.00	09.13	07.34	13.34	10.30	10.59	04.02	06.00	06.00
7	00.38	12.00	10.32	07.30	13.30	12.19	11.03	06.54	00.38	00.19
8	01.30	12.00	11.51	07.26	13.26	14.08	11.07	09.46	01.29	00.44
9	02.20	12.00	00.30	07.22	13.22	15.58	11.11	12.38	02.19	01.09
10	03.11	12.00	01.49	07.18	13.18	17.47	11.15	15.31	03.10	01.34
11	04.01	12.00	03.08	07.14	13.15	19.36	11.19	18.23	04.00	01.59
12	04.52	12.00	04.27	07.10	13.11	21.25	11.23	21.15	04.51	02.23
13	05.42	12.00	05.47	07.06	13.07	23.14	11.27	24.07	05.41	02.48
14	06.33	12.00	07.06	07.02	13.03	25.03	11.30	00.07	00.19	03.13
15	07.23	12.00	08.25	06.58	12.59	01.03	11.34	02.59	01.89	03.38
16	08.14	12.00	09.44	06.54	12.55	02.52	11.38	05.51	02.00	04.02
17	09.04	12.00	11.03	06.50	12.51	04.42	11.42	08.43	02.50	04.26
18	09.55	12.00	12.22	06.46	12.47	06.31	11.46	11.35	03.41	04.51
19	10.45	12.00	01.01	06.42	12.43	08.20	11.50	14.27	04.31	05.16
20	11.36	12.00	02.20	06.38	12.39	10.09	11.54	17.20	05.22	05.41
21	00.01	12.00	03.39	06.34	12.35	11.58	11.58	20.12	06.12	00.00
22	00.51	12.00	04.58	06.30	12.31	13.47	12.02	23.04	00.50	00.25
23	01.42	12.00	05.17	06.26	12.27	15.36	12.06	25.56	01.41	00.50
24	02.32	12.00	07.36	06.22	12.23	17.25	12.10	01.56	02.31	01.15
25	03.23	12.00	08.55	06.18	12.19	19.14	12.14	04.48	03.21	01.40
26	04.13	12.00	10.14	06.14	12.15	21.03	12.18	07.40	04.12	02.04
27	05.04	12.00	11.33	06.10	12.11	22.92	12.22	10.32	05.02	02.29
28	05.54	12.00	00.13	06.06	12.07	24.81	12.26	13.24	05.53	02.53
29	06.45	12.00	01.32	06.02	12.03	00.41	12.30	16.16	00.31	03.18
30	07.35	12.00	02.51	05.58	11.59	02.30	12.34	19.08	01.21	03.43

HEURES DES PLEINES MERS POTENTIELLES A GREENWICH  
TIMES OF POTENTIAL HIGH WATERS AT GREENWICH  
TABLE Tm  
MAI 1944

	M <sub>2</sub>	S <sub>2</sub>	N <sub>2</sub>	K <sub>2</sub>	K <sub>1</sub>	O <sub>1</sub>	P <sub>1</sub>	Q <sub>1</sub>	M.	M.S.
1	06.46	12.00	12.28	09.54	15.54	22.27	08.35	08.17	00.35	03.20
2	07.37	12.00	01.07	09.50	15.50	24.16	08.40	11.09	01.23	03.43
3	08.27	12.00	02.26	09.46	15.46	00.16	08.44	14.01	02.16	04.10
4	09.17	12.00	03.45	09.42	15.42	02.05	08.48	16.53	03.06	04.33
5	10.08	12.00	05.04	09.38	15.38	03.59	08.52	19.45	03.56	05.00
6	10.58	12.00	06.23	09.34	15.34	05.44	08.56	22.37	04.47	05.28
7	11.49	12.00	07.42	09.30	15.30	07.35	09.00	25.29	05.37	05.48
8	00.13	12.00	09.01	09.26	15.26	09.22	09.04	01.29	00.13	00.07
9	01.04	12.00	10.20	09.22	15.22	11.11	09.08	04.21	01.06	00.31
10	01.54	12.00	11.39	09.19	15.18	13.00	09.12	07.14	01.56	00.56
11	02.45	12.00	00.19	09.15	15.15	14.49	09.16	10.06	02.46	01.21
12	03.35	12.00	01.38	09.11	15.11	16.39	09.20	12.58	03.36	01.46
13	04.26	12.00	02.57	09.07	15.07	18.28	09.24	15.50	04.27	02.11
14	05.16	12.00	04.16	09.03	15.03	20.17	09.28	18.42	05.17	02.35
15	06.07	12.00	05.35	08.59	14.59	22.06	09.32	21.34	06.08	03.00
16	06.57	12.00	06.54	08.55	14.55	23.56	09.36	24.26	00.45	03.25
17	07.48	12.00	08.13	08.51	14.51	25.45	09.40	00.26	01.36	03.50
18	08.38	12.00	09.32	08.47	14.47	01.45	09.44	03.18	02.26	04.15
19	09.28	12.00	10.51	08.43	14.43	03.34	09.47	06.10	03.17	04.39
20	10.19	12.00	12.10	08.39	14.39	05.24	09.51	09.03	04.07	05.04
21	11.10	12.00	00.49	08.36	14.36	07.14	09.55	11.55	04.58	05.29
22	12.00	12.00	02.08	08.32	14.32	09.03	09.59	14.47	05.48	05.54
23	00.25	12.00	03.27	08.28	14.28	10.52	10.03	17.39	00.25	00.12
24	01.16	12.00	04.46	08.24	14.24	12.41	10.07	20.31	01.17	00.37
25	02.06	12.00	06.05	08.20	14.20	14.30	10.11	23.23	02.07	01.02
26	02.57	12.00	07.24	08.16	14.16	16.19	10.15	26.15	02.58	01.27
27	03.47	12.00	08.43	08.12	14.12	18.09	10.19	02.15	03.48	01.52
28	04.38	12.00	10.02	08.06	14.08	19.58	10.23	05.07	04.39	02.16
29	05.28	12.00	11.21	08.04	14.04	21.47	10.27	07.59	05.29	02.41
30	06.19	12.00	00.00	08.00	14.00	23.36	10.31	10.31	00.07	03.06
31	07.09	12.00	01.19	07.57	13.56	25.25	10.35	13.43	00.57	03.31

HEURES DES PLEINES MERS POTENTIELLES A GREENWICH  
TIMES OF POTENTIAL HIGH WATERS AT GREENWICH  
AOUT 1944

TABLE Tm

	M <sub>2</sub>	S <sub>2</sub>	N <sub>2</sub>	K <sub>2</sub>	K <sub>1</sub>	O <sub>1</sub>	P <sub>1</sub>	Q <sub>1</sub>	M <sub>1</sub>	MS <sub>1</sub>
1	09.38	12.00	07.01	03.53	09.53	09.05	14.40	03.29	03.26	04.44
2	10.29	12.00	08.20	03.49	09.49	10.54	14.44	06.21	04.17	05.09
3	11.19	12.00	09.39	03.45	09.45	12.43	14.48	09.13	05.07	05.34
4	12.10	12.00	10.58	03.41	09.41	14.32	14.52	12.09	05.58	05.59
5	01.35	12.00	12.17	03.37	09.37	16.21	14.56	14.58	06.36	00.17
6	02.16	12.00	00.56	03.34	09.34	18.11	15.00	17.49	01.26	00.42
7	03.07	12.00	02.15	03.31	09.31	20.00	15.04	20.41	02.17	01.07
8	03.57	12.00	03.34	03.27	09.27	21.49	15.08	23.33	03.07	01.32
9	04.48	12.00	04.53	03.23	09.23	23.38	15.12	26.25	03.58	01.57
10	05.38	12.00	06.12	03.19	09.19	25.28	15.16	28.25	04.48	02.22
11	06.29	12.00	07.31	03.15	09.15	01.28	15.20	05.17	05.38	02.47
12	07.19	12.00	08.50	03.11	09.11	03.16	15.24	08.09	00.16	03.11
13	08.09	12.00	10.08	03.07	09.07	05.05	15.28	11.01	01.07	03.36
14	08.99	12.00	11.27	03.03	09.03	06.54	15.32	13.53	01.57	04.00
15	09.00	12.00	00.06	02.99	08.99	08.43	15.36	16.45	02.48	04.25
16	09.50	12.00	01.25	02.96	08.96	10.31	15.40	19.36	03.38	04.50
17	10.41	12.00	02.44	02.92	08.92	12.20	15.44	22.28	04.29	05.15
18	11.31	12.00	04.03	02.88	08.88	14.10	15.48	25.20	05.19	05.40
19	12.22	12.00	05.22	02.84	08.84	15.59	15.52	01.20	06.10	06.05
20	00.47	12.00	06.41	02.80	08.80	17.48	15.55	04.12	00.47	00.23
21	01.37	12.00	08.00	02.76	08.76	19.37	15.59	07.04	01.38	00.48
22	02.28	12.00	09.19	02.72	08.72	21.26	16.03	09.56	02.28	01.13
23	03.18	12.00	10.38	02.68	08.68	23.16	16.07	12.48	03.19	01.38
24	04.09	12.00	11.57	02.65	08.65	25.05	16.11	15.41	04.09	02.02
25	04.59	12.00	00.37	02.61	08.61	01.54	16.15	18.35	05.00	02.27
26	05.50	12.00	01.56	02.57	08.57	03.43	16.19	21.25	05.50	02.52
27	06.40	12.00	03.15	02.53	08.53	05.33	16.23	24.17	00.28	03.17
28	07.31	12.00	04.34	02.49	08.49	06.52	16.27	00.17	01.19	03.42
29	08.21	12.00	05.53	02.45	08.45	08.21	16.31	03.10	02.09	04.06
30	09.12	12.00	07.12	02.41	08.41	10.11	16.35	06.02	03.00	04.31
31	10.02	12.00	08.31	02.37	08.37	12.00	16.39	08.54	03.50	04.56

HEURES DES PLEINES MERS POTENTIELLES A GREENWICH  
TIMES OF POTENTIAL HIGH WATERS AT GREENWICH  
JUILLET 1944

TABLE Tm

	M <sub>2</sub>	S <sub>2</sub>	N <sub>2</sub>	K <sub>2</sub>	K <sub>1</sub>	O <sub>1</sub>	P <sub>1</sub>	Q <sub>1</sub>	M <sub>1</sub>	MS <sub>1</sub>
1	08.23	12.00	04.10	05.55	11.55	04.20	12.38	22.00	02.12	04.07
2	09.14	12.00	05.29	05.51	11.51	06.09	12.42	24.52	03.02	04.32
3	10.04	12.00	06.48	05.47	11.47	07.58	12.46	00.52	03.53	04.57
4	10.54	12.00	08.07	05.43	11.43	09.47	12.50	03.44	04.43	05.22
5	11.45	12.00	09.26	05.39	11.39	11.36	12.54	06.36	05.34	05.47
6	00.10	12.00	10.45	05.35	11.35	13.26	12.58	09.28	00.12	00.05
7	01.01	12.00	12.04	05.32	11.32	15.15	13.02	12.20	01.02	00.31
8	01.51	12.00	00.43	05.28	11.27	17.04	13.06	15.12	01.52	00.55
9	02.42	12.00	02.02	05.24	11.23	18.53	13.10	18.04	02.43	01.20
10	03.32	12.00	03.21	05.20	11.19	20.42	13.14	20.56	03.33	01.45
11	04.23	12.00	04.40	05.16	11.16	22.31	13.18	23.48	04.24	02.10
12	05.13	12.00	05.59	05.12	11.12	24.20	13.22	26.40	05.15	02.35
13	06.04	12.00	07.19	05.08	11.08	00.20	13.26	02.40	06.05	02.59
14	06.54	12.00	08.38	05.04	11.04	02.10	13.29	05.32	00.43	03.24
15	07.45	12.00	09.57	05.00	11.00	03.99	13.33	08.24	01.34	03.49
16	08.35	12.00	11.16	04.96	10.96	05.48	13.37	11.17	02.24	04.14
17	09.26	12.00	12.35	04.92	10.92	07.37	13.41	14.09	03.14	04.39
18	10.16	12.00	01.14	04.88	10.88	09.27	13.45	17.01	04.05	05.03
19	11.06	12.00	02.33	04.85	10.84	11.16	13.49	19.53	04.55	05.28
20	11.57	12.00	03.52	04.81	10.80	13.05	13.53	22.45	05.46	05.53
21	00.22	12.00	05.11	04.77	10.77	14.54	13.57	25.37	00.24	00.12
22	01.13	12.00	06.30	04.73	10.73	16.43	14.01	01.37	01.14	00.36
23	02.03	12.00	07.49	04.69	10.69	18.32	14.05	04.29	02.05	01.01
24	02.54	12.00	09.08	04.65	10.65	20.22	14.09	07.21	02.55	01.26
25	03.44	12.00	10.27	04.61	10.61	22.11	14.13	10.13	03.46	01.51
26	04.35	12.00	11.46	04.57	10.57	24.00	14.17	13.05	04.36	02.16
27	05.25	12.00	00.26	04.53	10.53	25.49	14.21	15.57	05.27	02.46
28	06.16	12.00	01.45	04.49	10.49	01.49	14.25	18.49	00.05	03.05
29	07.06	12.00	03.04	04.45	10.45	03.38	14.29	21.41	00.55	03.30
30	07.57	12.00	04.23	04.41	10.41	05.27	14.33	24.35	01.45	03.55
31	08.47	12.00	05.42	04.37	09.57	07.17	14.37	00.35	02.36	04.20

HEURES DES PLEINES MERS POTENTIELLES A GREENWICH  
TIMES OF POTENTIAL HIGH WATERS AT GREENWICH  
SEPTEMBRE 1944

	M <sub>2</sub>	S <sub>2</sub>	N <sub>2</sub>	K <sub>2</sub>	K <sub>1</sub>	O <sub>1</sub>	P <sub>1</sub>	Q <sub>1</sub>	M.	M.S.
1	10.52	12.00	09.50	01.53	07.53	13.49	16.43	11.46	04.40	05.21
2	11.42	12.00	11.09	01.49	07.49	15.38	16.47	14.38	05.31	05.46
3	00.08	12.00	12.28	01.45	07.45	17.27	16.51	17.30	00.09	00.04
4	00.58	12.00	01.07	01.41	07.41	19.16	16.55	20.22	00.59	00.29
5	01.49	12.00	02.26	01.37	07.37	21.05	16.59	23.14	01.50	00.54
6	02.39	12.00	03.45	01.33	07.33	22.55	17.02	26.06	02.40	01.19
7	03.29	12.00	05.04	01.29	07.29	24.44	17.06	02.06	03.31	01.43
8	04.20	12.00	06.23	01.25	07.25	00.44	17.10	04.58	04.21	02.08
9	05.10	12.00	07.42	01.21	07.21	02.33	17.14	07.50	05.12	02.33
10	06.01	12.00	09.01	01.17	07.17	04.22	17.18	10.42	06.02	02.58
11	06.51	12.00	10.20	01.13	07.14	06.11	17.22	13.34	00.39	03.23
12	07.42	12.00	11.39	01.09	07.10	08.00	17.26	16.27	01.30	03.47
13	08.32	12.00	00.19	01.05	07.06	09.49	17.30	19.19	02.20	04.12
14	09.23	12.00	01.38	01.01	07.02	11.39	17.34	22.11	03.11	04.37
15	10.13	12.00	02.57	00.97	06.58	13.28	17.38	25.03	04.01	05.02
16	11.04	12.00	04.16	00.93	06.54	15.17	17.42	01.03	04.52	05.27
17	11.54	12.00	05.35	00.89	06.50	17.06	17.46	03.56	05.42	05.52
18	00.20	12.00	06.54	00.85	06.46	18.55	17.50	06.48	00.21	00.10
19	01.10	12.00	08.13	00.81	06.42	20.44	17.54	09.40	01.12	00.35
20	02.01	12.00	09.32	00.77	06.38	22.34	17.58	12.32	02.02	01.00
21	02.51	12.00	10.51	00.73	06.34	24.23	18.02	15.24	02.52	01.25
22	03.41	12.00	12.10	00.69	06.30	00.23	18.06	18.17	03.43	01.49
23	04.32	12.00	00.49	00.65	06.26	02.12	18.10	21.09	04.33	02.14
24	05.22	12.00	02.08	00.61	06.22	04.01	18.14	24.02	05.24	02.39
25	06.13	12.00	03.27	00.57	06.18	05.50	18.18	00.02	00.02	03.04
26	07.03	12.00	04.46	00.53	06.14	07.39	18.21	02.54	00.52	03.28
27	07.54	12.00	06.05	00.49	06.10	09.28	18.25	05.46	01.43	03.52
28	08.44	12.00	07.24	00.45	06.06	11.18	18.29	08.38	02.33	04.17
29	09.35	12.00	08.43	00.42	06.03	13.07	18.33	11.29	03.24	04.42
30	10.25	12.00	10.02	11.58	05.59	14.56	18.37	14.14	04.14	05.07

HEURES DES PLEINES MERS POTENTIELLES A GREENWICH  
TIMES OF POTENTIAL HIGH WATERS AT GREENWICH  
OCTOBRE 1944

	M <sub>2</sub>	S <sub>2</sub>	N <sub>2</sub>	K <sub>2</sub>	K <sub>1</sub>	O <sub>1</sub>	P <sub>1</sub>	Q <sub>1</sub>	M.	M.S.
1	11.15	12.00	11.21	11.53	05.55	16.45	18.41	17.13	05.05	05.32
2	12.05	12.00	00.01	11.49	05.51	18.34	18.45	20.05	05.55	05.56
3	00.31	12.00	01.20	11.45	05.47	20.23	18.49	22.57	00.33	00.15
4	01.21	12.00	02.39	11.41	05.43	22.13	18.53	25.49	01.23	00.40
5	02.11	12.00	03.58	11.37	05.39	24.02	18.57	01.49	02.14	01.05
6	03.02	12.00	05.17	11.33	05.35	00.02	19.01	04.41	03.04	01.29
7	03.52	12.00	06.36	11.29	05.31	01.51	19.05	07.33	03.55	01.54
8	04.43	12.00	07.55	11.25	05.27	03.41	19.09	10.25	04.45	02.19
9	05.33	12.00	09.14	11.21	05.23	05.30	19.13	13.17	05.36	02.44
10	06.24	12.00	10.33	11.17	05.19	07.19	19.17	16.09	00.14	03.09
11	07.14	12.00	11.52	11.13	05.15	09.08	19.21	19.01	01.04	03.33
12	08.05	12.00	00.32	11.09	05.11	10.98	19.25	21.53	01.55	03.58
13	08.96	12.00	01.53	11.05	05.07	12.48	19.28	24.45	02.45	04.23
14	09.87	12.00	03.12	11.01	05.03	14.38	19.32	00.45	03.36	04.47
15	10.77	12.00	04.31	10.97	04.99	16.27	19.36	03.37	04.26	05.12
16	11.28	12.00	05.50	10.93	04.95	18.16	19.40	06.30	05.17	05.38
17	12.18	12.00	07.09	10.89	04.92	20.05	19.44	09.22	06.07	06.03
18	00.43	12.00	08.28	10.87	04.88	21.54	19.48	12.14	00.45	00.21
19	01.34	12.00	09.47	10.83	04.84	23.44	19.52	15.06	01.34	00.46
20	02.24	12.00	11.06	10.79	04.80	25.33	19.56	17.58	02.25	01.11
21	03.15	12.00	12.25	10.75	04.76	01.33	20.00	20.50	03.15	01.36
22	04.05	12.00	01.04	10.71	04.72	03.22	20.04	23.42	04.06	02.01
23	04.56	12.00	02.23	10.67	04.68	05.10	20.08	26.35	04.56	02.25
24	05.46	12.00	03.42	10.63	04.64	06.99	20.12	02.35	05.47	02.50
25	06.37	12.00	05.01	10.59	04.60	08.88	20.16	05.27	00.25	03.15
26	07.27	12.00	06.20	10.55	04.56	10.78	20.20	08.19	01.15	03.40
27	08.18	12.00	07.39	10.51	04.52	12.67	20.24	11.11	02.06	04.05
28	09.08	12.00	08.58	10.47	04.48	14.56	20.28	14.02	02.56	04.29
29	09.59	12.00	10.17	10.43	04.44	16.05	20.32	16.55	03.47	04.54
30	10.49	12.00	11.36	10.40	04.41	17.54	20.36	19.47	04.37	05.19
31	11.40	12.00	00.16	09.56	03.57	19.43	20.40	22.40	05.27	05.44

HEURES DES PLEINES MERS POTENTIELLES A GREENWICH  
TIMES OF POTENTIAL HIGH WATERS AT GREENWICH  
DECEMBRE 1944

TABLE Tm

	M <sub>2</sub>	S <sub>2</sub>	N <sub>2</sub>	K <sub>2</sub>	K <sub>1</sub>	O <sub>1</sub>	P <sub>1</sub>	Q <sub>1</sub>	M.	MS.
1	00.28	12.00	03.05	07.54	01.56	24.28	22.43	04.06	00.29	00.14
2	01.18	12.00	04.24	07.50	01.52	00.28	22.47	06.58	01.20	00.39
3	02.09	12.00	05.43	07.46	01.48	02.17	22.51	09.50	02.10	01.04
4	02.59	12.00	07.02	07.42	01.44	04.06	22.55	12.42	03.01	01.29
5	03.50	12.00	08.21	07.38	01.40	05.55	22.59	15.34	03.51	01.53
6	04.40	12.00	09.40	07.34	01.36	07.45	23.02	18.26	04.42	02.18
7	05.31	12.00	10.59	07.30	01.32	09.34	23.06	21.18	05.32	02.43
8	06.21	12.00	12.18	07.26	01.28	11.23	23.10	24.10	06.10	03.08
9	07.12	12.00	00.58	07.23	01.25	13.12	23.14	00.10	01.00	03.33
10	08.02	12.00	02.17	07.19	01.21	15.02	23.18	03.02	01.51	03.57
11	08.53	12.00	03.36	07.15	01.17	16.51	23.22	05.54	02.41	04.22
12	09.43	12.00	04.55	07.11	01.13	18.40	23.26	08.47	03.32	04.47
13	10.34	12.00	06.14	07.07	01.09	20.29	23.30	11.39	04.22	05.12
14	11.25	12.00	07.33	07.03	01.05	22.18	23.34	14.31	05.13	05.37
15	12.16	12.00	08.52	06.99	01.01	24.07	23.38	17.23	06.03	06.02
16	00.41	12.00	10.11	06.95	00.97	00.07	23.42	20.16	06.41	06.20
17	01.31	12.00	11.30	06.91	00.93	01.56	23.46	23.08	01.32	00.45
18	02.22	12.00	00.10	06.87	00.89	03.46	23.50	26.00	02.22	01.10
19	03.12	12.00	01.29	06.83	00.85	05.35	23.54	02.00	03.13	01.34
20	04.03	12.00	02.48	06.80	00.82	07.24	23.58	04.52	04.03	01.59
21	04.53	12.00	04.07	06.76	00.78	09.13	24.02	07.44	04.53	02.24
22	05.44	12.00	05.26	06.72	00.74	11.02	00.02	10.36	05.44	02.49
23	06.34	12.00	06.45	06.68	00.70	12.51	00.06	13.29	06.22	03.14
24	07.25	12.00	08.04	06.64	00.66	14.41	00.10	16.21	01.12	03.38
25	08.15	12.00	09.23	06.60	00.62	16.30	00.14	19.13	02.03	04.02
26	09.06	12.00	10.42	06.56	00.58	18.19	00.18	22.05	02.53	04.27
27	09.56	12.00	12.01	06.52	00.54	20.08	00.22	24.57	03.43	04.52
28	10.47	12.00	00.41	06.48	00.50	21.57	00.26	00.57	04.34	05.17
29	11.37	12.00	02.00	06.44	00.46	23.46	00.30	03.49	05.24	05.41
30	00.02	12.00	03.19	06.40	00.42	23.36	00.34	06.41	06.02	00.00
31	00.53	12.00	04.38	05.56	01.36	01.36	00.38	09.34	00.53	00.25

HEURES DES PLEINES MERS POTENTIELLES A GREENWICH  
TIMES OF POTENTIAL HIGH WATERS AT GREENWICH  
NOVEMBRE 1944

TABLE Tm

	M <sub>2</sub>	S <sub>2</sub>	N <sub>2</sub>	K <sub>2</sub>	K <sub>1</sub>	O <sub>1</sub>	P <sub>1</sub>	Q <sub>1</sub>	M.	MS.
1	00.05	12.00	01.34	09.52	03.53	21.32	20.43	25.32	00.05	00.02
2	00.55	12.00	02.53	09.48	03.49	23.22	20.47	01.32	00.56	00.27
3	01.46	12.00	04.12	09.44	03.45	25.11	20.51	04.24	01.46	00.52
4	02.36	12.00	05.31	09.40	03.41	01.11	20.55	07.16	02.37	01.17
5	03.27	12.00	06.50	09.36	03.37	03.00	20.59	10.08	03.27	01.42
6	04.17	12.00	08.09	09.32	03.33	04.49	21.02	13.00	04.18	02.06
7	05.08	12.00	09.28	09.28	03.29	06.38	21.06	15.92	05.08	02.31
8	05.58	12.00	10.47	09.24	03.25	08.27	21.10	18.44	05.58	02.56
9	06.49	12.00	12.06	09.20	03.21	10.17	21.14	21.36	06.37	03.21
10	07.39	12.00	00.45	09.17	03.18	12.06	21.18	24.28	01.27	03.46
11	08.30	12.00	02.04	09.13	03.14	13.55	21.22	00.28	02.17	04.11
12	09.20	12.00	03.23	09.09	03.10	15.44	21.26	03.20	03.08	04.35
13	10.11	12.00	04.42	09.05	03.06	17.33	21.30	06.12	03.98	05.00
14	11.01	12.00	06.01	09.01	03.02	19.22	21.34	09.04	04.49	05.25
15	11.52	12.00	07.20	08.97	02.98	21.11	21.38	11.56	05.39	05.50
16	00.17	12.00	08.39	08.93	02.95	23.00	21.42	14.48	06.17	06.08
17	01.07	12.00	09.58	08.89	02.91	24.49	21.46	17.40	01.08	06.33
18	01.58	12.00	11.17	08.85	02.87	00.49	21.50	20.33	01.58	06.58
19	02.48	12.00	12.36	08.81	02.83	02.38	21.54	23.25	02.48	01.23
20	03.39	12.00	01.15	08.77	02.79	04.27	21.58	26.18	03.39	01.48
21	04.29	12.00	02.34	08.73	02.75	06.16	22.02	02.18	04.29	02.12
22	05.20	12.00	03.52	08.69	02.71	08.05	22.06	05.10	05.20	02.37
23	06.10	12.00	05.12	08.65	02.67	09.55	22.10	08.02	06.10	03.02
24	07.01	12.00	06.31	08.61	02.63	11.44	22.14	10.54	06.48	03.27
25	07.51	12.00	07.50	08.58	02.60	13.33	22.18	13.46	01.39	03.52
26	08.42	12.00	09.09	08.54	02.56	15.22	22.22	16.38	02.29	04.16
27	09.32	12.00	10.28	08.50	02.52	17.11	22.26	19.30	03.20	04.41
28	10.23	12.00	11.47	08.46	02.48	19.00	22.30	22.22	04.10	05.06
29	11.13	12.00	00.27	08.42	02.44	20.50	22.34	25.14	05.01	05.31
30	12.04	12.00	01.46	07.58	02.00	22.39	22.38	01.14	05.51	05.56