

5th TWLWG Meeting – Helsinki, Finland

14 – 16 May 2013

Standard Constituent List

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THE UNITED KINGDOM
HYDROGRAPHIC OFFICE

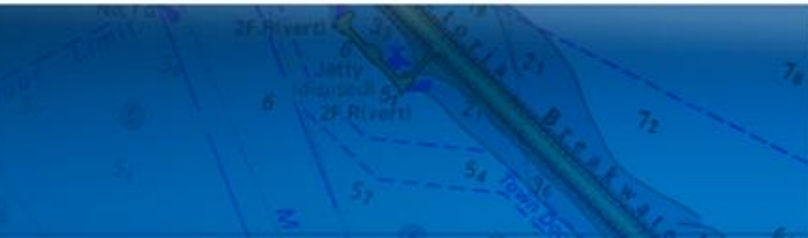


Standard Constituent List

- Available on the IHO TWLWG website at http://www.iho.int/mtg_docs/com_wg/IHOTC/IHOTC_Misc/TWLWG_Constituent_list.pdf
- Users of the list take the data to compute the angular speed of each constituent based on the XDO (Extended Doodson Number).
- Sum the products of the XDO multiplied by the angular speed of each Orbital Element.



- However the angular speeds of the individual Orbital Elements are not listed in the document; so users research them from a variety of sources.
- Orbital Elements:
 - T : Mean Lunar Day**
 - s : Sidereal Month**
 - h : Tropical Year**
 - p : Moon's Perigee**
 - N : Moon's Ascending Node**
 - p' : Perihelion**



Information received from South Korea

Angular Speed (W) (deg/hr)	User-Researched Astronomical Arguments			Standard Constituent List (IHO) ??
	Case 1 (Current best)	Case 2 Simon <i>et al.</i> (1994)	Case 3 Doodson (1921)	
W for T	14.49205212	14.49205212018	14.49205211	14.492052 (?)
W for s	0.54901651990	0.54901651973	0.54901653	0.5490165 (?)
W for h	0.04106863988	0.04106863991	0.041068638	0.041069 (?)
W for p	0.00464181350	0.00464181341	0.004641836	0.00464 (?)
W for N	0.00220640711	0.00220640687	0.002206413	(?)
W for p'	0.00000196146	0.00000196151	0.000001961	0.000002 (?)



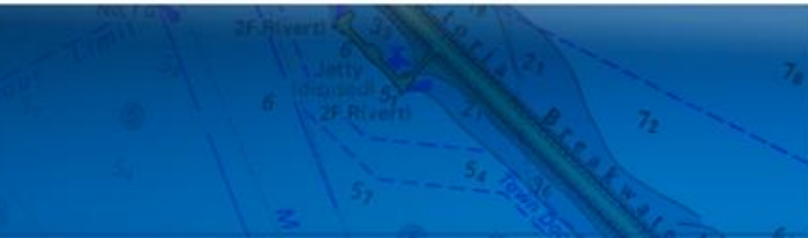
Information received from South Korea

Matching the published speeds of each constituent;

- Ninth Diurnals 'failed the test'

- Results of calculated 4MK9 angular speed using Orbital Elements T and s
- angular speed for 4MK9 = (9 x angular speed of T) + (1 x angular speed of s)

Orbital Element	T	s	h	p	N	p'	Calculated angular Speed (deg/hr)			
							Case 1 (Current best)	Case 2 <i>Simon et al.</i> (1994)	Case 3 Doodson (1921)	Standard Constituent List (IHO)
4MK9	9	1	0	0	0	0	130.97748560	130.97748560	130.97748552	130.977488
To 6 decimal places							130.977486	130.977486	130.977486	130.977488



Conclusions

- The differences noted by users is most likely to be caused by the precision of the angular speeds of the Orbital Elements T, s, h, p, N and p'
- The Standard Constituent List shows different results to 6 decimal places compared to that of the other cases (from Case 1 to Case 3).

Action?

- The angular speeds for each Orbital Element in the Standard Constituent List should be shown in the document (they are not shown there at the moment), and given to 7 places of decimals (minimum)
- The angular speeds of each tidal constituent in the Standard Constituents List should also be given to 7 places of decimals (minimum).

