

Re: Accuracy of converting semicircles to degrees

Source: <http://sci.tech-archive.net/Archive/sci.geo.satellite-nav/2004-11/1882.html>

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Date: 11/28/04

Date: Sun, 28 Nov 2004 14:10:58 GMT

On or about Sat, 27 Nov 2004 13:00:42 GMT, Bruce Stemplewski
<Bruce.Stemplewski@nospamstempsoft.com> wrote or did cause to be written:

>Garmin's formula for converting degrees to semicircles to degrees is:

>

> $d = s * (180.0D / 2^{31})$

>

>When $s = 119304640$

>

> $d = 9.9999994039536$

>

>But 10 was entered on the GPS. Does anyone know of a more accurate
>formula for converting semicircles to degrees?

>

$d = s * (180.0D / 2^{31}) + 0.000002$

When $s = 119304640$ and $D=1$ then $d = 10.000001403953552525650000000000$

Does that look better?

This reminds me of an operator that was continually writing up a system that was supposed to maintain 1500 pounds and the digital meter kept reading 1499. Tweak the meter to read 1501 and all the complaints stopped. How important is the difference other than it doesn't look right when there are a string of 9's rather than a string of 0's?

You should never expect more accuracy from an answer to a formula than the accuracy of the input. Therefore your d should be no more than 9 significant digits or 9.99999940. If we consider the 180.0 to really be 180 and an infinite number of zeros then the real max accuracy of the formula would be limited by 2^{31} or again 9 digits. 9 digit accuracy is VERY good. It is the difference between 30 years and 30 years plus 1 second. Do you really need more than that or is it just a string of 9's isn't as personally satisfying as a string of 0's??