

RTCA Special Committee 186, Working Group 3

ADS-B 1090 MOPS, Revision A

Meeting #11

**Coding of the “Vertical Rate” and the “Geo Altitude
Difference from Baro” Fields of the Airborne Velocity Message**

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SUMMARY
<p>This working paper raises a question received from industry on the coding of the Vertical Rate and Geo Altitude Difference from Baro Fields. The key question is the whether or not it is intended that the input data for these fields be rounded before encoding.</p>

Background

A revision appears to be needed in the MOPS to clarify the coding of the Vertical Rate and Geo Altitude Difference from Baro Fields in the Airborne Velocity message.

Details

Paragraph A.3.2, item 3 states that

“Unless otherwise specified, whenever more bits of resolution are available from the data source than in the data field into which that data is to be loaded, the data shall be rounded to the nearest value that can be encoded in that data field.”

However, the test procedures for the Vertical Rate and Geo Altitude Difference from Baro prevent rounding from being used except for the greatest coded value.

Geo. Alt Diff from Baro Alt Coding

The Geo. Alt Diff from Baro coding requirement is in 2.2.3.2.6.1.15. It does not specify that rounding is not to be used, so the presumption is that the input data should be rounded. However, the wording of the test in the last paragraph of Step 3 of 2.4.3.2.6.1.15 does not permit the use of rounding of the input data.

This paragraph states that the subfield in the output message should not be incremented until

"...the difference in the input values reaches a number corresponding to an even multiple of 25 feet."

Step 4 of this test specifies that "...values that are greater than 3,125 feet above the Barometric Altitude, but less than or equal to 3,137.5 feet above the Barometric Altitude..."shall be encoded as "126". It appears that this upper range is the only one that is rounded while everything below 3,125 feet is not rounded.

Vertical Rate Coding

The same situation exists for the Vertical Rate field. The Vertical Rate requirement is in 2.2.3.2.6.1.12 (which doesn't prohibit rounding) and its test is in 2.4.3.2.6.1.12 Step 3 last paragraph.

Specific Questions

- 1) Why are the Vertical Rate field and the Geo. Altitude Difference from Baro Altitude field the only ones singled out to “not round?”
- 2) Is it possible to change the DO-260 requirements to implement rounding for these fields? Or is there a good reason not to round?