

RTCA Special Committee 186, Working Group 5

ADS-B UAT MOPS Maintenance

RTCA Headquarters, Washington DC
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Proposed Changes to DO-282B for Encoding Ground Speed
In Response to Action Item 23-15

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Summary
This Working Paper addresses Action Item 23-15, which was to “specify the changes for Table 2-23 for the Ground Speed encoding for DO-282B.”

Introduction:

This Working Paper addresses Action Item 23-15, which was to “specify the changes for Table 2-23 for the Ground Speed encoding for DO-282B.”

I would like to propose a way to increase resolution of the ground speed field by using a new “A/G State” condition (i.e., reserved state “3” in Table 2-18) for ON GROUND use with the ground speed rescaled for a 0.25 kt LSB with maximum value of 256 knots. This would not be directly backward compatible but should have the effect of making ground speed NOT AVAILABLE to an early version receiver. This is better than having the early receiver being misled with an incorrect velocity. Ultimately, as early equipment is updated, they should shift to use of A/G State 3 allowing A/G State 2 to be someday recovered for future reserve use.

Proposal:

If the above approach is acceptable, then the specific changes would be as follows:

1. Replace the reserved row of Table 2-18 as follows:

Ownship Conditions	“A/G STATE” Field Encoding			Resulting “HORIZONTAL VELOCITY” Subfield Formats	
	MSB	LSB		“North Velocity or Ground Speed” Subfield Meaning	“East Velocity or Track Angle/Heading” Subfield Meaning
	Vertical Status (bit 1 of byte 13)	Subsonic/Supersonic (bit 2 of byte 13)	(decimal)		
AIRBORNE condition. Subsonic condition.	0	0	0	North Velocity (LSB = 1 kt)	East Velocity (LSB = 1 kt)
AIRBORNE condition. Supersonic condition.	0	1	1	North Velocity (LSB = 4 kts)	East Velocity (LSB = 4 kts)
ON GROUND condition.	1	0	2	Ground Speed (LSB = 1 kt)	Track/Heading
ON GROUND condition (high resolution)	1	1	3	Ground Speed (LSB = 0.25 kt)	Track/Heading

2. Add a new column for A/G State = 3 in Table 2-23 as follows:

Coding MSB(binary)LSB	Coding (decimal)	Meaning (A/G STATE = 2)	Meaning (A/G STATE = 3)
00 0000 0000	0	Ground Speed information not available	Ground Speed information not available
00 0000 0001	1	Ground Speed is ZERO	Ground Speed is ZERO
00 0000 0010	2	Ground Speed = 1 knots	Ground Speed = 0.25 knots
00 0000 0011	3	Ground Speed = 2 knots	Ground Speed = 0.50 knots
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11 1111 1110	1022	Ground Speed = 1021 knots	Ground Speed = 255.50 knots
11 1111 1111	1023	Ground Speed > 1021.5 knots	Ground Speed > 255.625 knots

3. Add new Section §2.2.4.5.2.5.3 for Ground Speed Encoding:

2.2.4.5.2.5.3 Ground Speed Encoding

When determination of Vertical Status determines an ON GROUND condition to be in effect, equipment conforming to this version of these MOPS **shall** use the A/G STATE encoding of “3” and the high resolution form of Ground Speed as encoded in Table 2-23.