

**RTCA Special Committee 186, Working Group 5**

**ADS-B UAT MOPS**

**Meeting #18**

**Teleconference**

**Comments on Aspects of DO-282  
Deserving of Clarification  
With Respect to Optional Input Data Elements**

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**SUMMARY**

**This Working Paper presents a discussion of Input Data Elements that are Optional for various equipment classes. Recommendations are made for improving the clarity of the UAT MOPS text, without altering the intent of the requirements as-written.**

## **Introduction:**

As defined in RTCA DO-282 Table 2-64 ("Transmitter Input Requirements"), several of the Input Data Elements are listed as Optional for various equipment classes. This paper results from a detailed analysis of the specific text of the requirements for use of these Optional Data Elements.

### **1. Requirements for Transmission Input Requirements**

Section 2.2.7.1 provides the requirements text for Table 2-64. Subparagraph 'b' describes how the "Optional" input elements are handled. The as-written text is provided here for reference.

§2.2.7.1.b Data elements indicated as "Optional," that have no input interface, shall always indicate the "data unavailable" condition.

This text is most applicable to Data Elements that have a corresponding Field in the transmitted message payload. The text does not provide sufficient guidance for Input Elements that are used by the UAT transmitting subsystem, but do not necessarily map one-for-one into a transmitted Field. These types of non-transmitted Input Elements include the Altitude Type Selection (Element #5), and the Radio Altitude (Element #41).

#### **Recommendation:**

Modify the text of §2.2.7.1.b as follows:

§2.2.7.1.b Data elements indicated as "Optional," that have no input interface, shall always indicate the "data unavailable" condition, [or be processed using the "data unavailable" procedures related to that element.](#)

### **2. Clarification of specific requirements text:**

In some cases, the MOPS text includes phrases such as "if available" to describe the appropriate processing of Optional Input Elements. The remainder of this Working Paper suggests clarifications in cases where the appropriate processing is not identified.

#### **Altitude Type Selection (Element #5)**

##### **Recommendation:**

Modify §2.2.4.5.2.2, third paragraph, second sentence, as follows:

["A means shall be provided If an Altitude Type Selection input is available, it shall be used](#) to operationally select the preferred ALTITUDE TYPE that is reported if more than one ALTITUDE TYPE is available."

#### **Ground Speed (Element #12)**

##### **Recommendation:**

Modify §2.2.4.5.2.6.2, the first sentence as follows:

"When the "A/G STATE" field is set to "2", the "North Velocity or Ground Speed" component shall assume the "Ground Speed" format, [if Ground Speed is available, as indicated in Table 2-22](#)"

### **Track Angle (Element #13)**

#### **Recommendation:**

Modify §2.2.4.5.2.6.4, the first sentence as follows:

"When the "A/G STATE field is set to "2" the "East Velocity or Track Angle/Heading" component **shall** assume the "Track Angle/Heading" format indicated in Table 2-27. Heading shall be encoded if available; ~~if not available~~ otherwise Track Angle shall be encoded if available."

Note for reference in the discussion of Element #31 below, that the Track Angle/Heading format contains its own True/Magnetic indication field.

### **Geometric Vertical Rate (Element #16)**

#### **Recommendation:**

Modify §2.2.4.5.2.7.1.1 second sentence as follows:

"Vertical rate information shall come from a Geometric source, if available, when the *Precision* condition is met, specifically when:"

### **A/V Length, Width, & POA (Element #17)**

The existing text of §2.2.4.5.2.7.2 does not define any "data unavailable" condition for the Length, Width, and Position Offset Applied fields. This is consistent with Table 2-64 showing a "n/a" for the Data Lifetime, since this is static data for a given aircraft. However, these Input Data Elements are designated as Optional for the A0 and A1L equipment classes. Though the ADS-B MASPS (DO-242A §3.4.4.6) allows certain participants (Length < 25 meters and Width <= 34 meters) to not transmit the A/V Length and Width codes, the UAT MOPS as written makes no provision for not sending these codes. In addition, the UAT MOPS does not provide any guidance for the use of these codes in the case where these inputs are Optional and not provided.

#### **Recommendation:**

Modify Table 2-64 to make A/V Length, Width, and POA Mandatory for all aircraft classes.

### **True/Magnetic Heading Flag (Element #31)**

The name of this field is confusing, since it refers to either a Target Heading or Track Angle for the Target State Element, but only mentions "Heading".

#### **Recommendation:**

In Table 2-52, the text in the table should be modified as follows:

--~~Track~~Target Heading or Track Angle --"

Confusion over the scope of this True/Mag indicator is easy to achieve, since it exists in the MS Element, but refers to fields that appear in the TS Element in a different transmitted message.

#### **Recommendation:**

For improved clarity, modify the title of §2.2.4.5.4.14 as follows:

**2.2.4.5.4.14 "True/Magnetic HeadingIndicator" Flag for Target State Element**