

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

**ADS-B UAT MOPS (DO-282), Revision A**

**Meeting #15**

**Identifying the UAT Ground Uplink Application Data**

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**SUMMARY**

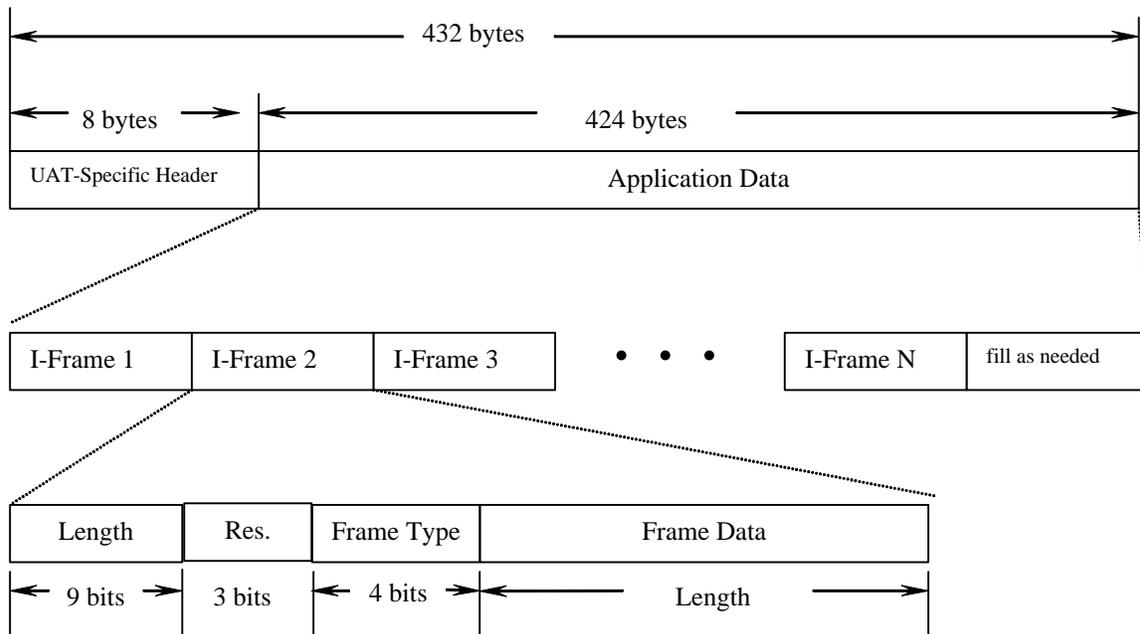
**This Working Paper proposes a format for Information Frames that would contain the incremental units of information conveyed in the UAT Ground Uplink Message. This framework of Information Frames offers the flexibility to support various kinds of uplink information as well as a mixture of information types within each Ground Uplink Message. It is recommended that this Information Frame format be codified in a future version of DO-282, perhaps as a normative Appendix.**

## 1.0 Background

This Working Paper proposes an approach to identify data conveyed in the UAT Ground Uplink Message “APPLICATION DATA” field based on that currently used in the FAA’s Capstone program where each independent unit of data can be self identified. In the case of FIS-B, these information units are referred to as Application Protocol Data Units (APDU), per the FIS-B MASPS, RTCA DO-267.

## 2.0 Proposed Approach: the Information Frame

The Ground Uplink Payload is composed of an eight-byte UAT-Specific Header, followed by 424 bytes of Application Data. The Application Data field is further composed of one or more *Information Frames (I-Frames)* of uplink service data, as shown in Figure 1.



**Figure 1 – Information Frame Concept**

Each of the fields illustrated in Figure 1 are discussed in the following subparagraphs.

## 2.1 UAT-Specific Header

The UAT-Specific Header is an 8-byte field that contains information on the location of the uplink site, the time slot used to send the present message, validity flags for position, time, and application data, and other fields as described in UAT MOPS §2.2.3.2.2.

## 2.2 Application Data

The Application Data is a fixed-length field of 424 bytes. The Application Data consists of *Information Frames*, and always consists of an integral number of bytes. Any remaining unused portion of the field filled with ZERO bytes.

## 2.3 Information Frame

Each Information Frame consists of ‘N’ bytes, comprising three fields formatted as described in Table 1:

**Table 1 - Information Frame**

Byte #	Bit 1	Bit 2	Bit 3	Bit 4	Bit 5	Bit 6	Bit 7	Bit 8	
1	MSB	<b>Length</b>							
2	LSB	Reserved			MSB	<b>Frame Type</b>		LSB	
3	<b>Frame Data</b>								
-									
N									

Note that the Byte numbers in this table are relative to the beginning of the current Information Frame.

The **Length** field (Byte 1: Bit 1 through Byte 2: Bit 1) is a 9-bit field that contains the length of the Frame Data field in bytes. Values range from 0 through 422 (decimal). The Length value is always equal to ‘N-2’.

The **Reserved** field (Byte 2: Bits 2 through 4) is a 3-bit field that is reserved for future use, and will be set to the ZERO value in equipment that complies with this document.

The **Frame Type** field (Byte 2: Bits 5 through 8) is a 4-bit field that contains the indication for the format of the Frame Data field. The Frame Types are defined in Table 2.

**Table 2- Frame Types**

MSB	Value (binary)	LSB	Frame Data Format
	0 0 0 0		FIS-B APDU
	0001 - 1111		Reserved

Each Frame Data format is described in the following subparagraphs. The Frame Data field is always an integral number of bytes in length.

### **3.0 Frame Data Format Types**

#### **3.1 FIS-B APDU**

When the Frame Type is the binary value “0 0 0 0”, the Frame Data contains an APDU Header, followed by the APDU Data, as described in §3.6, Appendix D, and Appendix E of RTCA DO-267.

#### **3.2 Other Potential Future Frame Data Types**

Fifteen reserved values remain for future use. Examples of possible use include frame types for the following functions:

- TIS-B management information that describe such items as service boundaries and target counts
- TIS-B target information in a compressed format as an alternative to the standard approach that conveys TIS-B target information in an ADS-B message format.
- Frames of differential GPS information
- Frames of addressed (unicast) data

### **4.0 Recommendation**

It is recommended that WG-5 consider this approach for self identifying individual data units conveyed in the UAT Ground Uplink message Application data. This information could be documented as a normative appendix in the next version of DO-282. This appendix would have to be maintained as new Frame Data Types are created.