EUROCONTROL Specification for Surveillance Data Exchange ASTERIX

Part 10 Category 063 Sensor Status Reports Reserved Expansion Field

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ASTERIX Part 10
Category 63 Appendix A
Sensor Status Reports
Reserved Expansion Field

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Abstract

This document specifies the contents of the Reserved Expansion Field of ASTERIX Category 063 messages used for the transmission of sensor status reports. For the purpose of this specification, a sensor may also be another SDPS.

Keywords

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Data Category	Data Field	Data Block	Data Item
ASTERIX	UAP	SDPS	

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DOCUMENT APPROVAL

This document has been approved by the ASTERIX Maintenance Group (AMG).

For management approval of the complete set of ASTERIX documentation refer to Part 1.

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1. INTRODUCTION

1.1 Scope of the Document

This document describes the way to encode information in the Reserved Expansion Field of ASTERIX CAT 063 (Sensor Status Message).

The CAT 063/RE is designed to enable the following applications:

1. Service ID regarding the Surveillance Data Source
2. Status for input SDSP for amalgamation purposes
3. High Resolution Time Stamping Bias for ADS-B Ground Stations

1.2 Service ID Regarding the Surveillance Data Source

On the sensor side, the concept of service ID is fully established in the ASTERIX standards. The main body of the CAT 063, the status of the sensor from a SDPS point of view, knows only the service ID of the SDPS, but not of the sensor.

Therefore CAT 063/REF provides an item to identify different services of the input surveillance data source to the SDPS. This information is important for systems, which gain their knowledge of the sensor status only via CAT 063.

To be able to refer to a specific service of the sensor, CAT 063/RE provides the following item:

- Surveillance Data Source Service Identification

1.3 Status for input SDPS for Amalgamation Purposes

The output of an SDPS can be used as input for another SDPS; this concept is usually known as track amalgamation or track-to-track fusion. The main body of CAT 063 addresses only the concept of sensor data input.

The intention is to be able to map the status of the input SDPS, given by CAT 065 to CAT 063/REF. In addition, another indication on the basic connectivity of the input SDPS has to be added.

To be able to map the status of an input SDPS onto CAT 063, CAT 063/RE provides the following items:

- Input SDPS Connectivity
- Input SDPS Configuration and Status
- Input SDPS Status Report

1.4 High Resolution Time Stamping Bias for ADS-B Ground Stations

CAT 021 ADS-B reports are able to provide a high resolution timestamp regarding the position and the velocity squitter. Based on multiple measurements for the same squitter message received at different locations, the source of the signal can be validated.

The current time bias in the CAT 063, I063/070, Time Stamping Bias, with an LSB of 1 ms, is only able to address a time bias regarding the reception time. To be able to incorporate a high resolution time stamping bias for a ADS-B Ground Stations identified by the sensor receiver ID into CAT 063, CAT 063/REF provides the following item:

- ADS-B Time Stamping Bias (High Resolution)

2. DESCRIPTION OF THE CONTENT OF RESERVED EXPANSION FIELD

2.1 Length Indicator

Definition: This field indicates the total length in octets of the Reserved Expansion Field (including the REF length indicator itself)

Format: One-octet fixed length Data Item

Structure:

Octet no. 1

8	7	6	5	4	3	2	1
LEN							

bits-8/1	(LEN)	Length of REF in octets, including the Length Indicator itself.

Encoding Rule :

This item shall be present in every REF

2.2 Items Indicator

Definition: This field indicates what are the items encoded in the REF

Format: Variable Length Data Item, comprising of a primary subfield of one octet, followed by one-octet extensions as necessary.

Structure:

Octet no. 1

8	7	6	5	4	3	2	1
SSID	CON	ISCS	ISSR	ATSB	0	0	FX

bit-8	(SSID)	= 0	Surveillance Data Source Service Identification is not present in the REF
		= 1	Surveillance Data Source Service Identification is present in the REF
bit-7	(ISA)	= 0	Input SDPS Connectivity is not present in the REF
		= 1	Input SDPS Connectivity is present in the REF
bit-6	(ISCS)	= 0	Input SDPS Configuration and Status is not present in the REF
		= 1	Input SDPS Configuration and Status is present in the REF
bit-5	(ISSR)	= 0	Input SDPS Status Report is not present in the REF
		= 1	Input SDPS Status Report is present in the REF
bit-4	(ATSB)	= 0	ADS-B Time Stamping Bias (High Resolution) is not present in the REF
		= 1	ADS-B Time Stamping Bias (High Resolution) is present in the REF
bit-3/2	Spare bits set to zero		
bit-1	(FX)		Field Extension Indicator

Encoding Rule :

This item shall be present in every REF

2.3 Surveillance Data Source Service Identification

Definition: Identification of the service provided by the surveillance data source for input to the surveillance data processing system (SDPS).

Format: One-Octet fixed length data item.

Structure:

Octet no. 1

8	7	6	5	4	3	2	1
SSID							

bits-8/1 (SSID) Surveillance Data Source Service Identification

NOTE: The SSID contains the Service Identifier as provided by the Surveillance Data Source identified in Data Item I063/050. Examples for such a Service ID can be found in Data Items I021/015, 025/015 or 062/015.

Encoding Rule : This item is optional

2.4 Input SDPS Connectivity

Definition: Connectivity of the Input SDPS.

Format: One-Octet fixed length data item.

Structure:

Octet no. 1

8	7	6	5	4	3	2	1
CON		0	0	0	0	0	0

bits-8/7 (CON) Connectivity status

= 0 No information

= 1 Currently connected

= 2 Not currently connected

= 3 Invalid ASTERIX Value

bits-6/1 Spare bits set to zero

NOTE: The input SDPS is identified by I063/050, Sensor Identifier.

NOTE: For the input SDPS, CAT 065 is only available if the input SDPS is connected. The basic connectivity of the input SDPS is given by the connectivity status (CON). In cases where an input SDPS is configured but not connected, the status “Not currently connected” **shall** be used.

Encoding Rule : This item is optional

2.5 Input SDPS Configuration and Status

Definition: Status of the SDPS used for amalgamation purposes.

Format: One-Octet fixed length data item.

Structure:

Octet no. 1

8	7	6	5	4	3	2	1
NOGO		OVL	TSV	PSS		STTN	0

bits-8/7	(NOGO)	= 0	Operational
		= 1	Degraded
		= 2	Not currently connected
		= 3	Unknown
bit-6	(OVL)	= 0	Default
		= 1	Overload
bit-5	(TSV)	= 0	Default
		= 1	Invalid time source
bits-4/3	(PSS)	Processing System Status	
		= 0	Not applicable
		= 1	SDPS-1 selected
		= 2	SDPS-2 selected
		= 3	SDPS-3 selected
bit-2	(STTN)	Track re-numbering indication	
bit-1	Spare bits set to zero		

NOTE: The status is mapped from I065/040, SDPS Configuration and Status.

Encoding Rule : This item is optional

2.6 Input SDPS Status Report

Definition: Status of the SDPS used for amalgamation purposes.

Format: One-Octet fixed length data item.

Structure:

Octet no. 1

8	7	6	5	4	3	2	1
REPORT							

bits-8/1 (REPORT) SDPS Status Report

NOTE: This data item copies the values from Data Item I065/050. The definition of the values contained in REPORT can be found in Data Item I065/050.

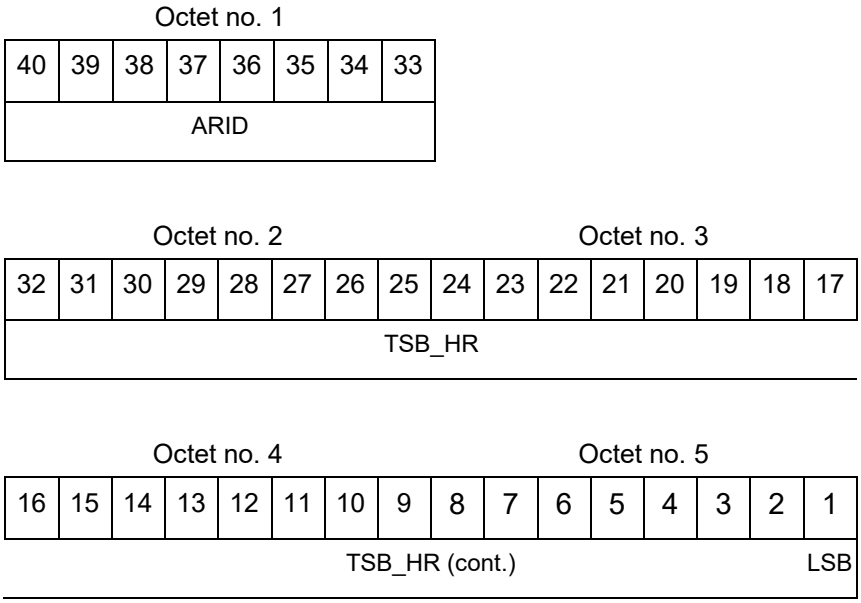
Encoding Rule : This item is optional

2.7 ADS-B Time Stamping Bias (High Resolution)

Definition: ADS-B High Resolution Time Stamping Bias (in two's complement) for a specific ADS-B Ground Station.

Format: Five-Octet fixed length data item.

Structure:



bits-33/40	(ARID)	ADS-B Receiver Identification
bits-32/1	(TSB_HR)	Time Stamping Bias (high Resolution), in two's complement
bit-1	(LSB)	1 ns

NOTE: The ADS-B Receiver ID is mapped from I021/400, Receiver ID.

Encoding Rule : This item is optional

REF Encoding Rule:

The Reserved Expansion Field is optional.

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