



International Civil Aviation Organization

**THIRD MEETING OF ADS-B STUDY AND
IMPLEMENTATION TASK FORCE (ADS-B TF/3)**

Bangkok, Thailand, 23-25 March 2005

Agenda Item 5: review result of ADS-B Working Group Meeting

ASTERIX FORMAT FOR SHARING ADS-B DATA IN ASIA PACIFIC REGION

(Presented by Australia)

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SUMMARY

Eurocontrol maintains ASTERIX data format standards for data sharing between Air Traffic Control automation systems. ASTERIX 21 has been chosen as the international format for ADS-B. The USA, based on 4 years of operational experience has expanded upon ASTERIX 21, and created an ASTERIX 33 message format for use of ADS-B in United States (US) ground automation systems. This paper summarizes the differences in those formats and suggests to work with Eurocontrol to amend the ASTERIX 21 format to include the additional data elements in ASTERIX 33. While that effort is ongoing, it is recommended for Asia Pacific to use ASTERIX 21 for sharing of ADS-B data internationally. Individual States may elect to use any format internally that meets their needs.

1 Introduction

1.1 Eurocontrol maintains ASTERIX data format standards for data sharing between Air Traffic Control automation systems. ASTERIX 21 has been standardized as the international format for ADS-B. The US, based on 4 years of operational experience has expanded upon ASTERIX 21, and created an ASTERIX 33 message format for use of ADS-B in US ground automation systems.

1.2 At the October 2004 ADS-B Task Force Working Group Meeting, Australia and the US took an action to coordinate a recommendation to the next Task Force recommending an ASTERIX format message set to be used for sharing of ADS-B data in the Asia Pacific region for the next meeting (Most likely it will be either format 21 or 33).

2 Comparison of ASTERIX 21 and 33

2.1 The following tables summarize the differences in the current ASTERIX 21 and 33 formats.

Comparison of US Cat 33 to Eurocontrol Cat 21 for ADS-B Reports

US Cat 33			Eurocontrol Cat 21 (Nov 03)	
FRN	Data Item	Comment	Corresponding Info Present in Cat 21?	Comment
1	Version Number		NO	
2	Data Source Identifier		YES	
3	Link Technology Indicator	Includes Link Version #	SORT OF	Link Version # not present

4	Time of Applicability		YES	Called “Time of Day”
5	Target Address	Includes Address Qualifier	YES	Address Qualifier provided in separate data item
6	Integrity and Accuracy Parameters	NIC, NACp, SIL, UTC, Pos Est, Vel Est	NO	There is a “Figure of Merit” data item that encodes NUCp and whether the report is based on “differential corrections”
7	Latitude/Longitude		YES	Called “Position in WGS-84 Coordinates”
8	Pressure Altitude		YES	Called “Flight Level”
9	Velocity (Airborne)	Includes vertical rate labeled as baro or geo	YES	Info in polar format and presented in multiple data items: “Ground Vector”, “Barometric Vertical Rate” and “Geometric Vertical Rate”
10	Velocity (Surface)	Accommodates heading if available	YES	Bit 15 (GBS) of I21/040 explicitly indicates “on the surface”
11	Mode 3/A Code		NO	
12	Target Identification	Flight ID/Call Sign	YES	
13	Emitter Category		SORT OF	Encoding does not track RTCA exactly
14	Target Status		YES	Encoding does not track RTCA exactly
15	Geometric Altitude		YES	
16	<i>Reserved for Future</i>			
17	Time of Message Transmission		NO	
18	Time of Message Reception		NO	
19-22	<i>Reserved for Future</i>			

Data Items present in Cat 21 that have no correspondence in Cat 33

	Data Item	Description of Data Item
	Time of Day Accuracy	The maximum difference between the actual time of applicability of the reported position and the time reported in the “Time of Day” data item. The purpose of this item is not clear.
	Velocity Accuracy	Maps to NACv
	Trajectory Intent	Express 4D trajectory. This is a relatively large data item with many subfields.
	Intermediate State Selected Altitude	Short term vertical intent
	Final State Selected Altitude	ATC Cleared Altitude
	Air Speed	
	True Airspeed	
	Rate of Turn	
	Met Information	Wind speed, wind direction, temperature, turbulence
	Roll Angle	

3 Recommendations

3.1 The US and Australia will work with Eurocontrol to amend the ASTERIX 21 format to include the additional data elements in ASTERIX 33 as appropriate. As operational experience is gained in Asia Pacific it should also be shared with Eurocontrol for incorporation into ASTERIX 21.

3.2 While the above efforts are ongoing, it is recommended for Asia Pacific to use ASTERIX 21 version 0.23 for sharing of ADS-B data internationally. States should recognize that the ASTERIX 21 format will evolve, and should consider the potential for future upgrades in their system designs.

3.3 Individual States may elect to use any format within their States as meets their needs. For sharing of data international, the internal data format may need to be translated to allow international harmonization.
