EUROPEAN ORGANISATION FOR THE SAFETY OF AIR NAVIGATION

EUROCONTROL

EUROCONTROL STANDARD DOCUMENT

FOR

SURVEILLANCE DATA EXCHANGE

Part 20 : Category 247

Version Number Exchange

EUROPEAN AIR TRAFFIC MANAGEMENT

DOCUMENT IDENTIFICATION SHEET

DOCUMENT DESCRIPTION

Document Title	
Version Number Exchange	

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Abstract

This document describes the application of ASTERIX messages to the transmission of category version number report.

Keywords

	ASTERIX		
Data Item	Category 247	UAP	Version Number

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DOCUMENT STATUS AND TYPE

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ELECTRONIC BACKUP

INTERNAL REFERENCE NAME :

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DOCUMENT APPROVAL

The following table identifies all management authorities who have successively approved the present issue of this document.

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DOCUMENT CHANGE RECORD

The following table records the complete history of the successive editions of the present document.

EDITION	DATE	REASON FOR CHANGE	SECTIONS PAGES AFFECTED
0.10	October 2005	Creation of document	All
0.11	November 2005	Title changed to "Version Number Exchange"	All
1.0	May 2007	Scope updated Document Identification Sheet updated Signature Page updated Status updated to "Released Issue"	1.1.2 ii iii All
1.1	November 2007	Category renumbered to 247 because of conflict with existing category 242	All
1.2	January 2008	Item I247/015 (Service Identification) added	5.2.2

TABLE OF CONTENTS

EXECUTIVE SUMMARY

This document describes the general concepts and the message layout for the application of ASTERIX category 247 for the transmission of version number information related to the ASTERIX Categories used by a system.

1. INTRODUCTION

1.1 Scope

1.1.1 This document describes the message structure for the transmission of ASTERIX categories version number reports.

1.1.2 The use of intermediate editions of a specific ASTERIX category shall be limited to the test and development phase of a new system and/or a new ASTERIX category. As soon as the status of both is stable, the system shall be migrated to the use of the latest available version of a specific ASTERIX category.

2. REFERENCES

2.1 General

The following Documents and Standards contain provisions which, through references in this text, constitute provisions of this Eurocontrol Document.

At the time of publication of this Eurocontrol Document, the editions indicated for the referenced documents and standards were valid.

Any revision of the referenced ICAO Documents shall be immediately taken into account to revise this Eurocontrol Document.

Revisions of the other referenced documents shall not form part of the provisions of this Eurocontrol Document until they are formally reviewed and incorporated into this Eurocontrol Document.

In case of a conflict between the requirements of this Eurocontrol Document and the contents of the other referenced documents, this Eurocontrol Document shall take precedence.

2.2 Reference Documents

1. Eurocontrol Standard 000-1-92. Directives for the Uniform Drafting and Presentation of Eurocontrol Standard Documents. 1992.

2. Eurocontrol Standard SUR.ET1.ST05.2000-STD-01-01. All Purpose Structured Eurocontrol Surveillance Information Exchange - ASTERIX. Edition 1.29, Released Issue, February 2002.

3. ICAO Annex 5

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3.   DEFINITIONS, ACRONYMS AND ABBREVIATIONS

3.1   Definitions

For the purposes of this Eurocontrol Document, the following definitions shall apply:

3.1.1 **Catalogue of Data Items:** List of all possible Data Items of each Data Category describing the Data Items by their reference, structure, size and units (where applicable).

3.1.2 **Data Block:** Unit of information seen by the application as a discrete entity by its contents. A Data Block contains one or more Record(s) containing data of the same category.

3.1.3 **Data Category:** Classification of the data in order to allow for, inter alia, an easy identification.

3.1.4 **Data Field:** Physical implementation for the purpose of communication of a Data Item. It is associated with a unique Field Reference Number and is the smallest unit of transmitted information.

3.1.5 **Data Item:** The smallest unit of information in each Data Category.

3.1.6 **Measured Item:** A piece of information (e.g. the position of a target) derived from the sensor information and transmitted without any smoothing.

3.1.7 **Record:** A collection of transmitted Data Fields of the same category preceded by a Field Specification field, signalling the presence/absence of the various Data Fields

3.1.8 **User Application Profile:** The mechanism for assigning Data Items to Data Fields, and containing all necessary information which needs to be standardised for the successful encoding and decoding of the messages.

3.2   Acronyms and Abbreviations

For the purposes of this Eurocontrol Document the following shall apply:

°	Degree (angle)
ASTERIX	**A**ll Purpose **ST**ructured **E**urocontrol su**R**veillance **I**nformation E**X**change
CAT	Data Category
EATM	European Air Traffic Management
FL	Flight Level, unit of altitude (expressed in 100's of feet)
FRN	Field Reference Number
FSPEC	Field Specification
FX	Field Extension Indicator
ICAO	International Civil Aviation Organization
kt	knot = NM/hour, unit of speed
LEN	Length Indicator
LSB	Least Significant Bit
MLT	Multilateration
NM	Nautical Mile, unit of distance (1852 metres)
PSR	Primary Surveillance Radar
RDE-FG	Radar Data Exchange Focus Group
RE	Reserved Expansion Indicator
REP	Field Repetition Indicator
s	second, unit of time
SAC	System Area Code
SIC	System Identification Code
SMR	Surface Movement Radar
SMS	Surface Movement System
SP	Special Purpose Indicator
SPI	Special Position Identification
SSR	Secondary Surveillance Radar
SURT	Surveillance Team (EATM)
UAP	User Application Profile (see Definitions)
UTC	Coordinated Universal Time
WAM	Wide Area Multilateration
WGS-84	World Geodetic System 84

4. GENERAL PRINCIPLES

4.1 General

For the transmission of version number of ASTERIX categories the following types of messages have been defined:

- version number(s) report

4.2 Time Management

4.2.1 Definition

The time stamp shall be consistent with the time of report transmission.

4.2.2 Requirements for Time Stamping

The timestamping shall comply with ICAO Annex 5.

4.3 Unused Bits in Data Items.

Decoders of ASTERIX data shall never assume and rely on specific settings of spare or unused bits. However in order to improve the readability of binary dumps of ASTERIX records, it is recommended to set all spare bits to zero.

4.4 Definitions and Addressing Concepts

In order to address sources in an unambiguous way, a simple abstract model for concepts like sensors or systems has been designed.

4.4.1 System

In the framework of category 247 a System is any device delivering ASTERIX data.

4.4.2 Addressing Concepts: Assigning SAC/SIC Codes

By convention a dedicated and unambiguous SAC/SIC code shall be assigned to every System.

4.5 Service Messages

Periodic Status Messages (these messages should be used by systems to indicate their Categories version numbers periodically),

4.6 User Application Profile and Data Blocks

4.8.1   A single User Application Profile (UAP) is defined and shall be used for both target reports and service messages.

4.8.2   Data Blocks shall have the following layout.

CAT = 247	LEN		FSPEC	Items of the first record

where:

- Data Category (CAT) = 247, is a one-octet field indicating that the Data Block contains Multilateration data;

- Length Indicator (LEN) is a two-octet field indicating the total length in octets of the Data Block, including the CAT and LEN fields;

- FSPEC is the Field Specification.

4.7   Composition of Messages

4.9.1   Messages shall be composed of Data Items assembled in the order defined by the Field Reference Number (FRN) in the associated UAP.

4.9.2   When sent, items shall always be transmitted in a record with the corresponding FSPEC bits set to one.

5. LAYOUT OF MESSAGES

5.1 Standard Data Items

The standardised Data Items, which shall be used for the transmission of Category Version numbers are defined in Table 1 and described on the following pages.

Table 1 - Standard Data Items of Category 247

Data Item Ref. No.	Description	Resolution
I247/010	Data Source Identifier	N.A.
I247/015	Service Identification	N.A.
I247/140	Time of Day	N.A.
I247/550	Version number(s) of CAT used	N.A.

5.2   Description of Standard Data Items

5.2.1 Data Item I247/010, Data Source Identifier

Definition: Identification of the system from which the data are received.

Format: Two-octet fixed length Data Item.

Structure:

Octet no. 1								Octet no. 2							
16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
SAC								SIC							

bits-16/9   (SAC)   System Area Code

bits-8/1   (SIC)   System Identification Code

Encoding Rule : This item shall be present in each ASTERIX message

5.2.2 Data Item I247/015, Service Identification

Definition :   Identification of the service provided to one or more users.

Format :   One-Octet fixed length data item.

Structure:

Octet no. 1							
8	7	6	5	4	3	2	1
Service Identification							

bits 8/1   Service Identification

NOTE -   The service identification is allocated by the system

Encoding Rule :
This item is optional.

5.2.3 Data Item I247/140, Time of Day

Definition: Absolute time stamping expressed as UTC.

Format: Three-octet fixed length Data Item.

Structure:

Octet no. 1

24	23	22	21	20	19	18	17
Time							

Octet no. 2   Octet no. 3

16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
					Of			Day							LSB

bit-1   (LSB)   1/128 s

NOTE -   The time of day value is reset to zero each day at midnight.

Encoding Rule : This item shall be present in each ASTERIX message

5.2.4 Data Item I247/550, Category Version Number Report

Definition: Version number of Categories used.

Format: Repetitive Data Item starting with a one-octet Field Repetition Indicator (REP) followed by at least one Version number report for each Category used and comprising one octet CAT number and one two octets Version Number (Main/Sub).

Structure:

Octet no. 1

32	31	30	29	28	27	26	25
REP

Octet no. 2

24	23	22	21	20	19	18	17
CAT

Octet no. 3 | | | | | | | Octet no. 4

16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Main version number								Sub version number							

bits-32/25	(REP)	Repetition factor
bits-24/17	CAT	ASTERIX Category [0..255]
bits-16/9	Main Version Number	[0..99] e.g Vers: **1**.1
bits-8/1	Sub Version Number	[0..99] e.g Vers: 1.**1**

Encoding Rule : This item shall be present in each ASTERIX message

5.3 Standard User Application Profile

5.3.1 The following UAP shown in Table 3 shall be used for the transmission of reports:

Table 3 - Standard UAP

FRN	Data Item	Information	Length in Octets
1	I247/010	Data Source Identifier	2
2	I247/015	Service Identification	1
3	I247/140	Time of Day	3
4	I247/550	Version number report	1+3*n
5	-	Spare	-
6	SP	Special Purpose Field	-
7	RE	Reserved Expansion Field	-
FX	-	Field Extension Indicator (set to 0)	-

where:

- the first column indicates the FRN associated to each Data Item used in the UAP;

- the fourth column gives the format and the length of each item. A stand-alone figure indicates the octet count of a fixed-length Data Item, 1+ indicates a variable-length Data Item comprising a first part of one-octet followed by n-octet extents as necessary.

The maximum length of the corresponding FSPEC is one octet.