ASTERIX CATEGORY 253 SPECIFICATION

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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
1	November 1999	Creation of document	All
2	April 2000	Modification in Item I253/030 Modification in Item I253/040 Modification of UAPs	2.1.5 2.1.6 2.2/2.3
3	June 2001	Introduction of the Standard UAP	2.2/2.3/2.4
4	June 2009	Modification in Item I253/030	2.1.5
5	November 2010	Modification in Item I253/030	2.1.5
6	August 2013	Modification in Item I253/030	2.1.5
7	June 2014	Modification in Item I253/030	2.1.5
8	December 2014	Modification in Item I253/030	2.1.5
9	May 2017	Modification in Item I253/030	2.1.5

Table of Contents

1. Introduction

This document contains a description of the ASTERIX category 253. This category is reserved for the remote monitoring and control.
Until now, no standard exists for ASTERIX category 253. Because the requirements of the different users of ASTERIX category 253 differ too much for a common definition, no attempt for standardisation of ASTERIX category 253 is made. This document describes therefore only the list of items that can be used by applications using ASTERIX category 253. The problem of different applications is solved by defining different UAPs for each user.

At this moment there are 3 users that are covered in this document:

- The IRSMC/REMP system of the DFS (Germany)
- The ERCAMS system of NATS (UK)
- The Thales Group applications

2. Layout of ASTERIX Category 253 messages

ASTERIX category 253 will have the following layout:

CAT = 253	**LEN**	**FSPEC**	Items of the first record	**FSPEC**	Items of the second record

Where:

- Data Category (CAT) = 253, is a one-octet field indicating that the Data Block contains remote control data.
- Length Indicator (LEN) is a two octet field indicating the total length in octets of the Data Block, including the CAT en LEN fields.
- FSPEC is the Field Specification.

The following Data Items shall be used for the exchange of command and status messages to monitor and control radar stations.

Data Items of Category 253

Data Item Reference No.	Description	System Units
I253/010	Data Source Identifier	N.A.
I253/015	Local Data Source Identifier	N.A.
I253/020	Data Destination Identifier	N.A.
I253/025	Data Destination and Local Identifier	N.A.
I253/030	Source Application Identifier	N.A.
I253/035	Data Origin Identifier	N.A.
I253/040	Message Type	N.A.
I253/050	Message Sequence ID	N.A.
I253/060	Blocking Information	N.A.
I253/070	Time of Day	1/128 s
I253/080	Application Data Structure	N.A.
I253/090	Application Data	N.A.
I253/100	Transparent Application Data 1	N.A.
I253/110	Transparent Application Data 2	N.A.

2.1 Description of the Data Items

2.1.1 Data Item I253/010, Data Source Identifier

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

Format: Two octets 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

NOTES
1) The defined SACs are listed in the ASTERIX manual Part 1, Table 2.
2) The defined SICs are listed in the ASTERIX manual Part 1, Annex B

2.1.2 Data Item I253/015, Local Data Source Identifier

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

Format: One octet fixed length Data Item.

Structure:

Octet no. 1							
8	7	6	5	4	3	2	1
Local ID							

bits-8/1 (Local ID) = Local Identifier per SAC/SIC

2.1.3 Data Item I253/020, Data Destination Identifier

Definition: Identification of the system to which the data must be sent.

Format: Repetitive Data Item, starting with a one-octet Field Repetition Indicator (REP) followed by at least one destination code of two-octet length.

Structure:

Octet no. 1

24	23	22	21	20	19	18	17
REP							

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

bits-24/17 (REP) = Number of SAC/SICs

bits-16/9 (SAC) = System Area Code

bits-8/1 (SIC) = System Identification Code

NOTES
1) The defined SACs are listed in the ASTERIX manual Part 1, Table 2.
2) The defined SICs are listed in the ASTERIX manual Part 1, Annex B

The SAC/SIC is used to uniquely identify the destinations of a CAT 253 message. The typical destination of a message from a server (i.e. a radar station) is a general one, a subset or all concerned clients. The destination of a message originating at a client is generally the server.

Additionally, it is possible that a client sends messages to one, a subset or all of the other clients. This is called client to client communication.

The underlying network, e.g. RADNET, will in all cases provide the routing function to distribute a message to the designated SAC/SICs.

2.1.4 Data Item I253/025, Data Destination and Local Identifier

Definition: Identification of the system to which the data must be sent.

Format: Repetitive Data Item, starting with a one-octet Field Repetition Indicator (REP) followed by at least one destination code of two-octet length.

Structure:

Octet no. 1

32	31	30	29	28	27	26	25
REP							

Octet no. 2								Octet no. 3							
24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9
SAC								SIC							

Octet no. 4

8	7	6	5	4	3	2	1
Local ID							

bits-32/25 (REP) = Number of destination identifiers

bits-24/17 (SAC) = System Area Code

bits-16/9 (SIC) = System Identification Code

bits-8/1 (Local ID) = Local identifier per SAC/SIC

NOTES
1) The defined SACs are listed in the ASTERIX manual Part 1, Table 2.
2) The defined SICs are listed in the ASTERIX manual Part 1, Annex B

The SAC/SIC together with the Local ID is used to uniquely identify the destinations of a CAT 253 message. The typical destination of a message from a server (i.e. a radar station) is a general one, a subset or all concerned clients. The destination of a message originating at a client is generally the server.

Additionally, it is possible that a client sends messages to one, a subset or all of the other clients. This is called client to client communication.

The underlying network, e.g. RADNET, will in all cases provide the routing function to distribute a message to the designated SAC/SICs.

2.1.5 Data Item I253/030, Source Application Identifier

Definition: Identification of the Source Application Identifier the message originates from.

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
Source Application Identifier															

bits-8/1 (SAI) = Source Application Identifier:

Value of 2 (decimal) used by NATS-UK (ERCAMS)
Values 3 – 34 (decimal) reserved for Thales
Values 35 – 39 (decimal) reserved for Cassidian Electronics
Values 40 – 45 (decimal) reserved for SELEX ES
Values 46 – 55 (decimal) reserved for Aireon
Values 56 – 65 (decimal) reserved for Aselsan A.S.
Values 110 – 120 (decimal) reserved for German Air Force

NOTES

The SAI is used to distinguish between different applications of the CAT 253 service. Whereas the basic structure of ASTERIX CAT 253 is the same for all applications, different applications may use only a subset of the items provided by the CAT 253 standard. Additionally, a customisation of the used items is feasible.

2.1.6 Data Item I253/035, Data Origin Identifier

Definition: Identification of the site which originally sent the data.
(not necessarily the same as the sender given in I253/010
and I253/015)

Format: Three octets fixed length Data Item.

Structure:

Octet no. 1								Octet no. 2							
24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9
OAC								OIC							

Octet no. 1							
8	7	6	5	4	3	2	1
Local ID							

bits-24/17 (OAC) = Origin Area Code

bits-16/9 (OIC) = Origin Identification Code

bits-8/1 (Local ID) = Local Identifier per SAC/SIC

NOTES
The OAC/OIC together with the Local ID is used to uniquely identify the origin of the data contained in the CAT 253 message. This original source of a message may either be a server (i.e. a radar station) or a client (e.g. an ATCC centre or an user within a centre). Note that it can differ from the sender of a CAT 253 message that is given in the data items I253/010 and I253/015.

2.1.7 Data Item I253/040, Message Type Identifier

Definition: The Message Type Identifier defines what kind of CAT 253 message was sent and identifies some basic properties of the message.

Format: One octet fixed length Data Item.

Structure:

Octet no. 1

8	7	6	5	4	3	2	1
PI	D	Message Type Identifier					

bit 8 (PI) = Priority Identifier

0 = low priority
1 = high priority

bit 7 (D) = Delivery bit

0 = no explicit acknowledgement compulsory
1 = explicit acknowledgement compulsory

bits 6/1 (MIT) = Message Type Identifier

1 = Time and Day
2 = Connect Request
3 = Connect Response
4 = Connect Release
5 = Command Token Request
6 = Command Token Release
7 = Command Token Assign
8 = Command Message
9 = Complete Status Transfer Message
10 = Delta Status Transfer Message
11 = Complete Status Transfer Request Message
12 = Centre Exchange Message
13 = Centre Status Message
14 = Centre Transparent Message
15 = Centre Resynchronisation Request Message
16 = Radar Monitoring Start Message
17 = Radar Monitoring Stop Message
18 = Acknowledgement
19 = Error
20 = Alarm
21 = Alive Message

NOTES
The priority of the message can be marked as “high” or “normal” (PI-bit). The D-Bit contains the information whether the current message shall be acknowledged by the recipient.

2.1.8 Data Item I253/050, Message Sequence Identifier

Definition: The Item Message Sequence Identifier contains consecutively incremented message counters for each receiving application. The ID counters shall be incremented by the originator application

Format: Repetitive Data Item, starting with a one-octet Field Repetition Indicator (REP) followed by at least one Message Sequence Identifier of two octet length.

Structure:

Octet no. 1							
24	23	22	21	20	19	18	17
REP							

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

bits-24/17 (REP) = Number of MSIDs

bits-16/1 (MSID) = Message Sequence Identifiers

Notes

The Message Sequence Identifier can be used by an application to associate acknowledgements or responses to the corresponding request. This may be important in case the issuing of requests is not synchronous, i.e. if an application has multiple outstanding requests at a time.

The Message Sequence Identifier is additionally used for applications that use an underlying network that potentially re-orders messages on the way to the receiver. For messages with multiple destinations (multicast transmissions) the sending application can specify a sequence number for each of the receiving instances. The order of the number of the sequence numbers must correspond to the order and number of SAC/SICs in I253/020 or I253/025.

2.1.9 Data Item I253/060, Blocking Information

Definition: The Blocking Information contains the total number of blocks (TNB) which have been generated out of one larger message and the block number (BN) of the current block in this sequence.

Format: Two octets 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
TNB								BN							

bits-16/9 (TNB) = Total Number of Blocks

bits-8/1 (BN) = Block Number of current block in sequence

NOTES

The Blocking Information is used for applications that use an underlying network which does not allow arbitrary length CAT 253 messages to be transmitted. It supports an application-driven segmentation and de-segmentation of messages into smaller parts.

2.1.10 Data Item I253/070, Time of Day

Definition: Absolute time stamping expressed as UTC time.

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

NOTES

The time information shall reflect the exact time of an event, expressed as a number of 1/128s elapsed since last midnight.

The time of day value is reset to zero each day at midnight and shall contain the originator's time stamp.

2.1.11 Data Item I253/080, Application Data Structure

Definition: Data item I253/080 conveys the structure and identity of the user data that is contained in the data item I253/090. The format of the transferred information is described below.

Format: Variable length Data Item compromising a first part of four octets, followed by one-octet extends as necessary.

Structure:

Octet no. 1 Octet no. 2

32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
START INDEX															LSB

Octet no. 3

16	15	14	13	12	11	10	9
COUNT							

Octet no. 4

8	7	6	5	4	3	2	1
STATUS							FX

bits-32/31 (START INDEX)= Provides identity of first object value to be transferred as part of the application data item. Index refers to an ordered list of objects previously agreed between client and server.

bits-16/9 (COUNT) = Indicates the number of object values with the same status to be transferred as part of the data field, starting with “Start Index” and using the consecutive numbers following this index. Thus, objects with the same status are bundled.

bits-8/1 (STATUS) = Provides common status information for all objects in the data field:

bit 8 = 0 non-stale data
= 1 stale data

bit 7 = 0 real data
= 1 simulated data

bit 6 = 0 monitored object under remote control
= 1 monitored object under local control

bit 5 = 0 no data included
= 1 data included

bit 4-2 = 0 reserved for application specific data
= 1 stale data

bit 1 = 0 End of item
= 1 Extension into another status segment

NOTES

1) Stale data is data that may not be up-to-date, e.g. because the acquisition processor has failed.

2) Simulated data may be data that an operator “manually” sets for various purposes.

3) The “Data_included” bit determines whether there exists a corresponding data field in I253/090 of this record.

4) Monitored objects under local control indicates that the object is not in an operational mode but in a maintenance mode.

5) This item transfers an FX-concatenated list of status segments that describe the identity, ordering and monitoring status of the monitoring data itself in I253/090. Each status segment represents a number of monitoring objects (specified in the count field) starting with the index given in the start index field. The indices are based on an agreed ordered list between client and server.

2.1.12 Data Item I253/090, Application Data Item

Definition: Data item I253/090 contains the monitoring data that is to be transmitted from server to client as a sequence of octets. The contents of this octet sequence are defined with the item I253/080

Format: Repetitive Data Item, starting with a one-octet Field Repetition Indicator (REP) followed by at least one Application Data block of sixteen octet length.

Structure:

Octet no. 1

136	135	134	133	132	131	130	129
REP							

Octet no. 2 Octet no. 3

128	127	126	125	124	123	122	121	120	119	118	117	116	115	114	113

Octet no. 4 Octet no. 5

112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97

Octet no. 6 Octet no. 7

96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81

Octet no. 8 Octet no. 9

80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65

Octet no. 10 Octet no. 11

64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49

Octet no. 12 Octet no. 13

48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33

Octet no. 14 Octet no. 15

32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17

Octet no. 16 Octet no. 17

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

bits-136/129 (REP) = Number of Application Data blocks

bits-128/1 (LSB) = block of 128 bits containing the application data to be transferred. The identity and the structure of this application data is specified in I253/080

2.1.13 Data Item I253/100, Transparent Application Data 1

Definition: The Transparent Application Data item contains application data not further standardised by ASTERIX CAT 253.

Format: Explicit length Data Item.

Structure:

Octet no. 1

<table>
<tr><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr>
<tr><td colspan="8">LEN</td></tr>
</table>

Octet no. 2

<table>
<tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td colspan="8">TAD octet 1</td></tr>
</table>

Octet no. LEN

<table>
<tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td colspan="8">TAD Data octet (LEN -1)</td></tr>
</table>

bits-8/1 (LEN) = Total Length of the Data Item including itself.

(TAD) = Sequence of bytes containing transparent application data for various purposes.

2.1.14 Data Item I253/110, Transparent Application Data 2

Definition: The Transparent Application Data item contains application data not further standardised by ASTERIX CAT 253.

Format: Explicit length Data Item.

Structure:

Octet no. 1

<table>
<tr><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr>
<tr><td colspan="8">LEN</td></tr>
</table>

Octet no. 2

<table>
<tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td colspan="8">TAD octet 1</td></tr>
</table>

Octet no. LEN

<table>
<tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td colspan="8">TAD Data octet (LEN -1)</td></tr>
</table>

bits-8/1 (LEN) = Total Length of the Data Item including itself.

(TAD) = Sequence of bytes containing transparent application data for various purposes.

2.2 Proposed standard user application

NOTE: This is a *PROPOSED* standard. There is no official standard concerning the implementation of ASTERIX category 253 data and it is not obligatory to use this proposal. However, this proposal is made as a guideline for future users of ASTERIX category 253 in order to have some kind of standardisation in this field.

2.2.1 Standard User Application Profile

The following UAP shall be used for the transmission of ASTERIX category 253 data:

User Application Profile

FRN	Data Item	Information	Length in Octets
1	I253/010	Data Source Identifier	2
2	I253/015	Local Data Source Identifier	1
3	I253/025	Data Destination and Local Identifier	(1 + 3 x n)
4	I253/030	Source Application Identifier	2
5	I253/040	Message Type Identifier	1
6	I253/050	Message Sequence ID	(1 + 2 x n)
7	I253/070	Time of Day	3
FX	-	Field Extension Indicator	-
8	I253/035	Data Origin Identifier	3
9	I253/060	Blocking Information	2
10	I253/080	Application Data Structures	4+
11	I253/090	Application Data	(1 + 16 x n)
12	I253/100	Transparent Application Data 1	N
13	-	Reserved for SP indicator	-
14	-	Reserved for RFS-indicator	-
FX	-	Field Extension Indicator	-

In the above table:

- 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 compromising a first part of one-octet followed by n-octets extend as necessary. (1 + a x n) indicates a repetitive Data Item compromising a first part of one-octet followed by n times a octets . N indicates an explicit length Data Item of N octets length.

The maximum length of the corresponding FSPEC is two octets.

2.2.2 Encoding Rules

1. Data Item I253/010 (Data Source Identifier) is compulsory and shall always be transmitted in each ASTERIX Data Record.

2. Data Item I253/015 is compulsory shall always be transmitted in each ASTERIX Data Record.

3. Data Item I253/025 is compulsory shall always be transmitted in each ASTERIX Data Record.

4. Data Item I253/030 is compulsory to protect unknown applications influencing an ASTERIX data processing entity. ASTERIX records of unknown applications should be discarded.

5. Data Item I253/035 is optional.

6. Data Item I253/040 is compulsory to label the message type on a high level.

7. Data Item I253/050 is an optional transaction identifier. Therefor a message originator shall increment the value every time a message is sent, or use another unique identification.

8. Data Item I253/060 is optional and used for segmentation and de-segmentation of ASTERIX records. The items I253/010, I253/015, I253/025, I253/030, I253/040, I253/050 shall be copied to the header of every segment being transmitted.

9. Data Item I253/070 is optional and may be used to distribute a Time of Day information

10. Data Items I253/080 and I253/090 shall be used to transmit ASTERIX application data for additional information when the current data packet is no data packet type. For the use of I253/090, the item I253/080 has to be present.

11. Bit 13 of the FSPEC shall be reserved for the Special Purpose Field (SP) Indicator. This permits the transmission of a variable length field not included in the UAP. the contents of such a field shall be agreed between users concerned, while those not concerned can skip the data.

12. Bit 14 of the FSPEC shall be reserved for the Random Field Sequence (RFS) Indicator. This permits the transmission of the standard Data Items in any order. Non standardised, specific information shall be transmitted using the SP field and not the RFS field.

The following table summarises the dependencies between the type of message and the inclusion of certain data items.

C = Compulsory
O = Optional

Message Type	010	015	025	030	035	040	050	060	070	080	090	100	Comments
Time and Day	C	C	C	C	O	C	-	-	C	-	-	-	-
Connect Request	C	C	C	C	O	C	O	-	O	-	-	O	-
Connect Response	C	C	C	C	O	C	O	-	O	-	-	O	-
Connect Release	C	C	C	C	O	C	O	-	O	-	-	O	-
Command Token Request	C	C	C	C	O	C	O	-	O	-	-	C	-
Command Token Release	C	C	C	C	O	C	O	-	O	-	-	C	-
Command Token Assign	C	C	C	C	O	C	O	-	O	-	-	C	-
Command Message	C	C	C	C	O	C	O	O	C	C	-	C	-
Complete Status Transfer Message	C	C	C	C	O	C	O	O	C	C	O	O	-
Delta Status Transfer Message	C	C	C	C	O	C	O	O	C	C	O	O	-
Complete Status Transfer Request Message	C	C	C	C	O	C	O	O	C	-	-	C	-
Radar Monitoring Start Message	C	C	C	C	O	C	O	O	C	-	-	C	-
Radar Monitoring Stop Message	C	C	C	C	O	C	O	O	C	-	-	C	-
Transparent Data Message	C	C	C	C	O	C	O	O	C	-	-	C	-
Acknowledgement	C	C	C	C	O	C	O	-	O	-	-	-	-
Alarm Message	C	C	C	C	O	C	-	-	O	-	-	-	-
Error Message	C	C	C	C	O	C	-	-	-	-	-	-	-
Alive Message	C	C	C	C	O	C	-	-	-	-	-	-	-

2.3 ERCAMS user application

NOTE: The ERCAMS application was developed *BEFORE* the Proposed Standard User Application. It deviates from the proposed standard in 2 points:

1. It uses a Data Source Identifier I253/010 which is a combination of the I253/10 and I253/15 of the Proposed Standard User Application. Therefor I253/010 is three octets long. The ASTERIX data is looks identical, but the FSEPC is different.

   In ASTERIX however, the Data Source Identifier is always a SAC/SIC of 2 bytes, so this was a violation of the ASTERIX standard. This has been solved in the Proposed Standard User Application by putting the local source identifier into a separate item.

2. The I253/025 was originally called I253/020. This is however only a paper matter and has no influence in the real world.

2.3.1 User Application Profile

The following UAP shall be used for the transmission of ERCAMS data:

User Application Profile

FRN	Data Item	Information	Length in Octets
1	I253/010	Data Source Identifier and Local Identifier	3
2	I253/025	Data Destination and Local Identifier	(1 + 3 x n)
3	I253/030	Source Application Identifier	2
4	I253/040	Message Type Identifier	1
5	I253/050	Message Sequence ID	(1 + 2 x n)
6	I253/070	Time of Day	3
7	I253/035	Data Origin Identifier	3
FX	-	Field Extension Indicator	-
8	I253/060	Blocking Information	2
9	I253/080	Application Data Structures	4+
10	I253/090	Application Data	(1 + 16 x n)
11	I253/100	Transparent Application Data 1	N
12	-	Spare	-
13	-	Reserved for SP indicator	-
14	-	Reserved for RFS-indicator	-
FX	-	Field Extension Indicator	-

In the above table:

- 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 compromising a first part of one-octet followed by n-octets extend as necessary. (1 + a x n) indicates a repetitive Data Item compromising a first part of one-octet followed by n times a octets . N indicates an explicit length Data Item of N octets length.

The maximum length of the corresponding FSPEC is two octets.

2.3.2 Encoding Rules

1. Data Item I253/010 (Data Source Identifier) is compulsory and shall always be transmitted in each ASTERIX Data Record.

2. Data Item I253/025 is compulsory shall always be transmitted in each ASTERIX Data Record.

3. Data Item I253/030 is compulsory to protect unknown applications influencing an ASTERIX data processing entity. ASTERIX records of unknown applications should be discarded.

4. Data Item I253/035 is optional.

5. Data Item I253/040 is compulsory to label the message type on a high level.

6. Data Item I253/050 is an optional transaction identifier. Therefor a message originator shall increment the value every time a message is sent, or use another unique identification.

7. Data Item I253/060 is optional and used for segmentation and de-segmentation of ASTERIX records. The items I253/010, I253/015, I253/025, I253/030, I253/040, I253/050 shall be copied to the header of every segment being transmitted.

8. Data Item I253/070 is optional and may be used to distribute a Time of Day information

9. Data Items I253/080 and I253/090 shall be used to transmit ASTERIX application data for additional information when the current data packet is no data packet type. For the use of I253/090, the item I253/080 has to be present.

10. Bit 13 of the FSPEC shall be reserved for the Special Purpose Field (SP) Indicator. This permits the transmission of a variable length field not included in the UAP. the contents of such a field shall be agreed between users concerned, while those not concerned can skip the data.

11. Bit 14 of the FSPEC shall be reserved for the Random Field Sequence (RFS) Indicator. This permits the transmission of the standard Data Items in any order. Non standardised, specific information shall be transmitted using the SP field and not the RFS field.

The following table summarises the dependencies between the type of message and the inclusion of certain data items.

C = Compulsory
O = Optional

Message Type	010	025	030	035	040	050	060	070	080	090	100	Comments
Time and Day	C	C	C	O	C	-	-	C	-	-	-	-
Connect Request	C	C	C	O	C	O	-	O	-	-	O	-
Connect Response	C	C	C	O	C	O	-	O	-	-	O	-
Connect Release	C	C	C	O	C	O	-	O	-	-	O	-
Command Token Request	C	C	C	O	C	O	-	O	-	-	C	-
Command Token Release	C	C	C	O	C	O	-	O	-	-	C	-
Command Token Assign	C	C	C	O	C	O	-	O	-	-	C	-
Command Message	C	C	C	O	C	O	O	C	C	-	C	-
Complete Status Transfer Message	C	C	C	O	C	O	O	C	C	O	O	-
Delta Status Transfer Message	C	C	C	O	C	O	O	C	C	O	O	-
Complete Status Transfer Request Message	C	C	C	O	C	O	O	C	-	-	C	-
Radar Monitoring Start Message	C	C	C	O	C	O	O	C	-	-	C	-
Radar Monitoring Stop Message	C	C	C	O	C	O	O	C	-	-	C	-
Transparent Data Message	C	C	C	O	C	O	O	C	-	-	C	-
Acknowledgement	C	C	C	O	C	O	-	O	-	-	-	-
Alarm Message	C	C	C	O	C	-	-	O	-	-	-	-
Error Message	C	C	C	O	C	-	-	-	-	-	-	-
Alive Message	C	C	C	O	C	-	-	-	-	-	-	-

2.4 General Purpose Transparent user application

NOTE: This application is derived from the DFS implementation of ASTERIX category 253. This application was also developed *BEFORE* the Proposed Standard User Application. It deviates completely from the Proposed Standard User Application.

2.4.1 User Application Profile

The following UAP shall be used for the transmission of IRSMC data:

User Application Profile

FRN	Data Item	Information	Length in Octets
1	I253/010	Data Source Identifier	2
2	I253/030	Source Application Identifier	2
3	I253/020	Data Destination Identifier	(1 + 2 x n)
4	I253/100	Transparent Application Data 1	N
5	I253/110	Transparent Application Data 2	N
6	-	Reserved for SP Indicator	-
7	-	Reserved for RFS Indicator (RS-bit)	-
FX	-	Field Extension Indicator	-

In the above table:

- 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 compromising a first part of one-octet followed by n-octets extend as necessary. (1 + a x n) indicates a repetitive Data Item compromising a first part of one-octet followed by n times a octets. N indicates an explicit length Data Item of N octets length.

The maximum length of the corresponding FSPEC is one octet.

2.4.2 Encoding Rules

1. Data Item I253/010 (Data Source Identifier) is compulsory and shall always be transmitted in each ASTERIX Data Record.

2. Data Item I253/030 is optional and shall be transmitted when required.

3. Data Item I253/020 is compulsory and shall always be transmitted in each ASTERIX Data Record.

4. Data Item I253/100 is optional and shall be transmitted when required.

5. Data Item I253/110 is optional and shall be transmitted when required.

6. Bit 6 of the FSPEC shall be reserved for the Special Purpose Field (SP) Indicator. This permits the transmission of a variable length field not included in the UAP. the contents of such a field shall be agreed between users concerned, while those not concerned can skip the data.

7. Bit 7 of the FSPEC shall be reserved for the Random Field Sequence (RFS) Indicator. This permits the transmission of the standard Data Items in any order. Non standardised, specific information shall be transmitted using the SP field and not the RFS field.