Asterix category 205 - Radio Direction Finder Reports

category: 205

edition: 1.0

date: 2020-03-17

Preamble

Surveillance data exchange.

Description of standard data items

I205/000 - Message Type

Definition: This Data Item allows for a more convenient handling of the messages at the receiver side by further defining the type of transaction.

Structure:

- 8 bits [. . . . .]
- values:

    1: System Position Report
    2: System Bearing Report
    3: System Position Report of conflicting transmission
    4: System Detection End Report
    5: Sensor Data Report

I205/010 - Data Source Identifier

Definition: Identification of the Radio Direction Finder System or Sensor from which the report is received.

Structure:

I205/010/SAC - *System Area Code*

- 8 bits [. . . . .]
- raw value

I205/010/SIC - *System Identification Code*

- 8 bits [. . . . .]
- raw value

Note: The up-to-date list of SACs is published on the EUROCONTROL Web Site (http://www.eurocontrol.int/asterix).

I205/015 - Service Identification

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

Structure:

- 8 bits [. . . . .]
- raw value

Note: The service identification is allocated by the system.

I205/030 - Time of Day

Definition: UTC time of transmission of this ASTERIX message.

Structure:

- 24 bits [. . . .]
- unsigned quantity
- unit: "s"
- LSB = $1/2^7$ s $\approx 7.81e-3$ s

Note: The TOD value is reset to zero at every midnight UTC.

I205/040 - Report Number

Definition: Sequential and cyclic number of position detection reports.

Structure:

- 8 bits [. . . . .]
- raw value

Note: The number is incremented if there is a new position or bearing detected, independent from the respective channel. The report number shall also be incremented if, during the ongoing position or bearing detection, the position or bearing value is deviating by a system-defined threshold from the previous one. If the message type (I205/000) changes to another Detection Report, the report number is incremented as well. to detect lost messages.

I205/050 - Position in WGS-84 Coordinates

Definition: Calculated position in WGS-84 Coordinates.

Structure:

I205/050/LAT - *Latitude in WGS-84*

- 32 bits [. . . .]
- signed quantity
- unit: "°"
- LSB = $180/2^2 5$ ° $\approx 5.36e-6$ °
- value $>= -90$ °
- value $<= 90$ °

I205/050/LON - *Longitude in WGS-84*

- 32 bits [. . . .]
- signed quantity
- unit: "°"
- LSB = $180/2^2 5$ ° $\approx 5.36e-6$ °
- value $>= -180$ °
- value < 180 °

Note: The LSB provides a resolution at least better than 0.6 meters. For reports of Message Type 001 and 003, the item shall contain the estimated position of the transmitting aircraft. For reports of Message Type 002, the item shall contain the position of the bearing starting point, i.e. the position of the respective RDF sensor.

I205/060 - Position in Cartesian Coordinates

Definition: Calculated position in Cartesian Coordinates.

Structure:

    I205/060/X - *X-coordinate*

- 24 bits [. . . .]
- signed quantity
- unit: "m"
- LSB = 1/2 m ≈ 0.50 m
- value >= −4194300 m
- value <= 4194300 m

    I205/060/Y - *Y-coordinate*

- 24 bits [. . . .]
- signed quantity
- unit: "m"
- LSB = 1/2 m ≈ 0.50 m
- value >= −4194300 m
- value <= 4194300 m

Note: The Cartesian coordinates are relative to an agreed System Reference Point. The System Reference Point may be communicated in ASTERIX category 025, item 600. For reports of Message Type 001 and 003, the item shall contain the estimated position of the transmitting aircraft. For reports of Message Type 002, the item shall contain the position of the bearing starting point, i.e. the position of the respective RDF sensor.

I205/070 - Local Bearing

Definition: Bearing of the detected radio transmission, starting at the position contained in I205/050 and given relative to this position.

Structure:

- 16 bits [. . . . .]
- unsigned quantity
- unit: "°"
- LSB = 1/100 ° ≈ $1.00e-2$ °
- value >= 0 °
- value <= 360 °

Note: The angle is given in degrees, in clock-wise notation, starting with 0 degrees for the geographical North.

I205/080 - System Bearing

Definition: Bearing of the detected radio transmission, starting at the position contained in I205/060, projected to the Cartesian Coordinate System relative to the System Reference Point (as used for I205/ 060).

Structure:

- 16 bits [. . . . .]
- unsigned quantity
- unit: "°"
- LSB = 1/100 ° ≈ $1.00e-2$ °

- value $>= 0$ °
- value $<= 360$ °

Note: The angle is given in degrees, in clock-wise notation, starting with 0 degrees for the geographical North.

I205/090 - Radio Channel Name

Definition: Name of the channel the radio transmission is detected on.

Structure:

- 56 bits [... 56 bits ...]
- Ascii string (8-bits per character)

Note: NU1 till NU7 contain digits or a decimal point in ASCII representation, specifying the name of the radio channel. Channel names that could be provided with less than 6 digits shall be filled with trailing zeroes (e.g. 121.100). This channel name is not identical with the actual physical frequency.

I205/100 - Quality of Measurement

Definition: Quality of the measurement provided by the Radio Direction Finder system.

Structure:

- 8 bits [........]
- raw value

Note: The actual meanings of the bits are application dependent.

I205/110 - Estimated Uncertainty

Definition: Uncertainty estimation of the RDF System. The transmitter is expected to be within the provided radius around the calculated position.

Structure:

- 8 bits [........]
- unsigned quantity
- unit: "m"
- LSB = 100 m
- value $>= 0$ m
- value $<= 25500$ m

I205/120 - Contributing Sensors

Definition: The identification of the RDF sensors that contributed to the detection of the radio transmitter.

Structure:

Repetitive item, repetition factor 8 bits.

- 8 bits [........]
- raw value

Note: The actual identification of the receivers is application dependent.

I205/130 - Conflicting Transmitter Position in WGS-84 Coordinates

Definition: Calculated position in WGS-84 Coordinates. This is the position of a second transmitter on the same frequency and overlapping in time with the transmitter position communicated in data item I205/050.

Structure:

I205/130/LAT - *Latitude in WGS-84*

- 32 bits [. . . . .]
- signed quantity
- unit: ”°”
- LSB = $180/2^{2}5$ ° $\approx 5.36e - 6$ °
- value $>= -90$ °
- value $<= 90$ °

I205/130/LON - *Longitude in WGS-84*

- 32 bits [. . . . .]
- signed quantity
- unit: ”°”
- LSB = $180/2^{2}5$ ° $\approx 5.36e - 6$ °
- value $>= -180$ °
- value < 180 °

Note: The LSB provides a resolution at least better than 0.6 meters.

I205/140 - Conflicting Transmitter Position in Cartesian Coordinates

Definition: Calculated position in Cartesian Coordinates. This is the position of a second transmitter on the same frequency and overlapping in time with the transmitter position communicated in data item I205/060.

Structure:

I205/140/X - *X-coordinate*

- 24 bits [. . . . .]
- signed quantity
- unit: ”m”
- LSB = $1/2$ m ≈ 0.50 m
- value $>= -4194300$ m
- value $<= 4194300$ m

I205/140/Y - *Y-coordinate*

- 24 bits [. . . . .]
- signed quantity
- unit: ”m”
- LSB = $1/2$ m ≈ 0.50 m
- value $>= -4194300$ m
- value $<= 4194300$ m

Note: The Cartesian coordinates are relative to an agreed System Reference Point. The System Reference Point may be communicated in ASTERIX category 025, item 600.

I205/150 - Conflicting Transmitter Estimated Uncertainty

Definition: Range uncertainty estimation of the RDF System for the Conflicting Transmitter, i.e. a transmitter on the same frequency and with a timely overlapping transmission. The transmitter is estimated to be within the provided radius around the detected position.

Structure:

- 8 bits [........]
- unsigned quantity
- unit: "m"
- LSB = 100 m
- value >= 0 m
- value <= 25500 m

I205/160 - Track Number

Definition: Unique identification of a track at the calculated RDF position.

Structure:

- 16 bits [................]
- raw value

I205/170 - Sensor Identification

Definition: Unique identification of an RDF sensor.

Structure:

- 8 bits [........]
- raw value

Note: For Message Type 5 (Sensor Data Report) in I205/000, the item has to be used if there is no unique SAC/SIC defined for each RDF Sensor. The actual identification number is application dependent

I205/180 - Signal Level

Definition: The level of the signal received by an RDF sensor.

Structure:

- 16 bits [................]
- signed quantity
- unit: "dBμV"
- LSB = $1/100$ dBμV $\approx 1.00e - 2$ dBμV

I205/190 - Signal Quality

Definition: Relative quality of the received signal as estimated by the RDF sensor.

Structure:

- 8 bits [........]
- raw value

Note: 255 corresponds to the best quality, 0 to the worst quality

I205/200 - Signal Elevation

Definition: The elevation of the signal received by an RDF sensor.

Structure:

- 16 bits [. . . . .]
- signed quantity
- unit: "°"
- LSB = $1/100$ ° $\approx 1.00e-2$ °
- value $>= -90$ °
- value $<= 90$ °

I205/SP - Special Purpose Field

Definition: Special Purpose Field

Structure:

Explicit item (SP)

User Application Profile for Category 205

- (1) I205/010 - Data Source Identifier

- (2) I205/015 - Service Identification

- (3) I205/000 - Message Type

- (4) I205/030 - Time of Day

- (5) I205/040 - Report Number

- (6) I205/090 - Radio Channel Name

- (7) I205/050 - Position in WGS-84 Coordinates

- (FX) - Field extension indicator

- (8) I205/060 - Position in Cartesian Coordinates

- (9) I205/070 - Local Bearing

- (10) I205/080 - System Bearing

- (11) I205/100 - Quality of Measurement

- (12) I205/110 - Estimated Uncertainty

- (13) I205/120 - Contributing Sensors

- (14) I205/130 - Conflicting Transmitter Position in WGS-84 Coordinates

- (FX) - Field extension indicator

- (15) I205/140 - Conflicting Transmitter Position in Cartesian Coordinates

- (16) I205/150 - Conflicting Transmitter Estimated Uncertainty

- (17) I205/160 - Track Number

- (18) I205/170 - Sensor Identification

- (19) I205/180 - Signal Level

- (20) I205/190 - Signal Quality

- (21) `I205/200` - Signal Elevation

- `(FX)` - Field extension indicator

- (22) `I205/SP` - Special Purpose Field

- (23) `(spare)`

- (24) `(spare)`

- (25) `(spare)`

- (26) `(spare)`

- (27) `(spare)`

- (28) `(spare)`

- `(FX)` - Field extension indicator