Asterix category 007 - Transmission of Directed Interrogation Messages

category: 007

edition: 1.12

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Preamble

Surveillance data exchange.

Description of standard data items

I007/010 - Data Source Identifier

definition: Identification of the radar station from which the data is received.

Group

I007/010/SAC - System Area Code

Element
bit size: 8
Raw Content

I007/010/SIC - System Identification Code

Element
bit size: 8
Raw Content

Note:

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

I007/020 - Type and Properties of the Target Report and Target Capabilities

definition: Type and properties of the target report and capabilities of the target.

Extended

I007/020/TYP

Element
bit size: 3
Values:

- **0:** No detection
- **1:** Single PSR detection
- **2:** Single SSR detection
- **3:** SSR + PSR detection
- **4:** Single ModeS All-Call
- **5:** Single ModeS Roll-Call
- **6:** ModeS All-Call + PSR
- **7:** ModeS Roll-Call + PSR

I007/020/SIM

Element
bit size: 1
Values:

- **0:** Actual target report

1: Simulated target report

I007/020/RDP

Element
bit size: 1
Values:

0: Report from RDP Chain 1
1: Report from RDP Chain 2

I007/020/SPI

Element
bit size: 1
Values:

0: Absence of SPI
1: Special Position Identification

I007/020/RAB

Element
bit size: 1
Values:

0: Report from aircraft transponder
1: Report from field monitor (fixed transponder)

(FX) - extension bit

I007/020/TST

Element
bit size: 1
Values:

0: Real target report
1: Test target report

I007/020/ERR

Element
bit size: 1
Values:

0: No Extended Range
1: Extended Range present

I007/020/XPP

Element
bit size: 1
Values:

0: No X-Pulse present
1: X-Pulse present

I007/020/ME

Element
bit size: 1
Values:

0: No military emergency
1: Military emergency

I007/020/MI

Element
bit size: 1
Values:

0: No military identification
1: Military identification

I007/020/FOEFRI

Element
bit size: 2
Values:

0: No Mode 4 interrogation
1: Friendly target
2: Unknown target
3: No reply

(FX) - extension bit

I007/020/ADSB - On-Site ADS-B Information

Group

I007/020/ADSB/EP - ADSB Element Populated Bit

Element
bit size: 1
Values:

0: ADSB not populated
1: ADSB populated

I007/020/ADSB/VAL - On-Site ADS-B Information

Element
bit size: 1
Values:

0: Not available
1: Available

I007/020/SCN - Surveillance Cluster Network Information

Group

I007/020/SCN/EP - SCN Element Populated Bit

Element
bit size: 1
Values:

0: SCN not populated
1: SCN populated

I007/020/SCN/VAL - Surveillance Cluster Network Information

Element
bit size: 1
Values:

0: Not available
1: Available

I007/020/PAI - Passive Acquisition Interface Information

Group

I007/020/PAI/EP - PAI Element Populated Bit

Element
bit size: 1
Values:

0: PAI not populated
1: PAI populated

I007/020/PAI/VAL - Passive Acquisition Interface Information

Element
bit size: 1
Values:

0: Not available
1: Available

Spare bits: 1

(FX) - extension bit

I007/020/ACASVX - ACAS Extended Version

Group

I007/020/ACASVX/EP - ACASVX Element Populated Bit

Element
bit size: 1
Values:

0: ACASVX not populated
1: ACASVX populated

I007/020/ACASVX/VAL - ACAS Extended Version Value

Element
bit size: 4
Values:

0: Non-Extended Version
1: ACAS Xa Version 1
2: ACAS Xu Version 1
3: Reserved for future versions
4: Reserved for future versions
5: Reserved for future versions
6: Reserved for future versions
7: Reserved for future versions
8: Reserved for future versions
9: Reserved for future versions
10: Reserved for future versions
11: Reserved for future versions
12: Reserved for future versions
13: Reserved for future versions
14: Reserved for future versions
15: Reserved for future versions

I007/020/POXPR - PO Transponder Capability

Group

I007/020/POXPR/EP - POXPR Element Populated Bit

Element
bit size: 1
Values:

0: POXPR not populated
1: POXPR populated

I007/020/POXPR/VAL - PO Transponder Capability

Element
bit size: 1
Values:

0: PO not supported (PPM only)
1: PO supported

(FX) - extension bit

I007/020/POACT - PO Active for Current Plot

Group

I007/020/POACT/EP - POACT Element Populated Bit

Element
bit size: 1
Values:

0: POACT not populated
1: POACT populated

I007/020/POACT/VAL - PO Active for Current Plot

Element
bit size: 1
Values:

0: PO not active

1: PO active

I007/020/DTFXPR - Basic Dataflash Transponder Capability

Group

I007/020/DTFXPR/EP - DTFXPR Element Populated Bit

Element
bit size: 1
Values:

0: DTFXPR not populated
1: DTFXPR populated

I007/020/DTFXPR/VAL - Basic Dataflash Transponder Capability

Element
bit size: 1
Values:

0: Basic Dataflash not supported
1: Basic Dataflash supported

I007/020/DTFACT - Basic Dataflash Active for Current Plot

Group

I007/020/DTFACT/EP - DTFACT Element Populated Bit

Element
bit size: 1
Values:

0: DTFACT not populated
1: DTFACT populated

I007/020/DTFACT/VAL - Basic Dataflash in Current Plot

Element
bit size: 1
Values:

0: Basic Dataflash not active
1: Basic Dataflash active

Spare bits: 1

(FX) - extension bit

I007/020/IRMXPR - IRM Transponder Capability

Group

I007/020/IRMXPR/EP - IRMXPR Element Populated Bit

Element
bit size: 1
Values:

0: IRMXPR not populated
1: IRMXPR populated

I007/020/IRMXPR/VAL - Transponder IRM Capability

Element
bit size: 1
Values:

0: Transponder not IRM capable
1: Transponder IRM capable

I007/020/IRMACT - IRM Active for Current Plot

Group

I007/020/IRMACT/EP - IRMACT Element Populated Bit

Element
bit size: 1
Values:

0: IRMACT not populated

1: IRMACT populated

I007/020/IRMACT/VAL - IRM Active for Current Plot

Element
bit size: 1
Values:

0: IRM not active
1: IRM active

Spare bits: 3
(FX) - extension bit

Notes:

1. For Mode S aircraft, the SPI information is also contained in I007/230.
2. To bits 3/2 of extension 1 (FOE/FRI): IFF interrogators supporting a three level classification of the processing of the Mode 4 interrogation result shall encode the detailed response information in data item M4E of the Reserved Expansion Field of category 007. In this case the value for FOE/FRI in I007/020 shall be set to "00". However, even those interrogators shall use I007/020 to encode the information "No reply".
3. To bit 6 of extension 1 (XPP): This bit shall always be set when the X-pulse has been extracted, independent from the Mode it was extracted with.
4. To bit 7 of extension 1 (ERR): This bit set to "1" indicates that the range of the target is beyond the maximum range in data item I007/040. In this case – and this case only - the ERR Data Item in the Reserved Expansion Field shall provide the range value of the Measured Position in Polar Co-ordinates.
5. To Extension 2: The EUROCONTROL Specification for European Mode S Stations Edition 4.0 (EMS 4.0) [Ref. 4] defines new functionalities that can use external data inputs. The possibilities described in EMS 4.0 cover the presence of target information acquired via the on-site ADS-B, the Surveillance Cluster Network or the Passive Acquisition Interface. The second extension provides information – per target – on whether such information is available supporting performance improvements, e.g. Passive Acquisition, and new features, e.g. detection of a potential IC Conflict.
6. To Extensions 3, 4, and 5: The transponder MOPS ED-73F/DO-181F (Minimum Operational Performance Standard [Ref. 2]) defines new optional functionalities:
   - Basic Dataflash (to reduce BDS registers extractions by groundsystems)
   - IRM (Interrogation/Reply Monitoring)
   - Phase Overlay (to convey more data within a single long Roll Call Reply, using Downlink Formats 20 and 21)
7. To Extensions 3 and 4: To populate bits in these extensions, Mode S radars will have to decode/analyse the content of BDS register 1,0 (bits 15, 42 and 44) as per [Ref. 2].

I007/025 - Data Destination Identifier

definition: Identification of the radar station to which the data is sent.

Group

I007/025/SAC - System Area Code

Element
bit size: 8
Raw Content

I007/025/SIC - System Identification Code

Element
bit size: 8
Raw Content

Note:

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

I007/030 - Warning/Error Conditions

definition: Warning/error conditions detected by a radar station for the target report involved.

Repetitive

With FX extension bit.

Element
bit size: 7
Values:

0: Not defined; never used
1: Multipath Reply (Reflection)
2: Reply due to sidelobe interrogation/reception
3: Split plot
4: Second time around reply
5: Angel
6: Slow moving target correlated with road infrastructure (terrestrial vehicle)
7: Fixed PSR plot
8: Slow PSR target
9: Low quality PSR plot
10: Phantom SSR plot
11: Non-Matching Mode-3/A Code
12: Mode C code/Mode S altitude code abnormal value compared to the track
13: Target in Clutter Area
14: Maximum Doppler Response in Zero Filter
15: Transponder anomaly detected
16: Duplicated or Illegal Mode S Aircraft Address
17: Mode S error correction applied
18: Undecodable Mode C code/Mode S altitude code
19: Birds
20: Flock of Birds
21: Mode 1 was present in original reply
22: Mode 2 was present in original reply
23: Plot potentially caused by Wind Turbine
24: Helicopter
25: Maximum number of re-interrogations reached (surveillance information)
26: Maximum number of re-interrogations reached (BDS Extractions)
27: BDS Overlay Incoherence
28: Potential BDS Swap Detected
29: Track Update in the Zenithal Gap
30: Mode S Track re-acquired
31: Duplicated Mode 5 Pair NO/PIN detected
32: Wrong DF reply format detected
33: Transponder anomaly (MS XPD replies with Mode A/C to Mode A/C-only all-call)
34: Transponder anomaly (SI capability report wrong)
35: Potential IC Conflict
36: IC Conflict detection possible - no conflict currently detected

37: Duplicate Mode 5 PIN (refer to the Mode 5 items in the REF)
64: Ambiguous acknowledge, overlapping interrogation windows
65: Ambiguous acknowledge, duplicated request for same Mode S address
66: Ambiguous acknowledge, duplicated request for same track number
67: Reject, unable to process
68: Reject, too many parallel requests (exceeds system parameter for maximum number of requests per scan)
69: Reject, duplicated request

Notes:

1. It has to be stressed that a series of one or more W/E conditions can be reported per target report.
2. Data conveyed in this item are of secondary importance, and can generally also be derived from the processing of mandatory items.
3. Definitions can be found in SUR.ET1.ST03.1000-STD-01-01 Radar Sensor Performance Analysis.
4. Warning/Error codes of 64 and higher are reserved for Directed Interrogation messages.
5. Values 25 to 30 and 32 to 36 have been defined to comply with the Edition 4.0 of the EUROCONTROL Specification for European Mode S Station (EMS) [Ref. 7] and to provide the possibility to report the following information:
   - Code 25: the maximum number of permitted re-interrogations to acquire the surveillance information has been reached;
   - Code 26: the maximum number of permitted re-interrogations to extract BDS Registers has been reached;
   - Code 27: inconsistency detected between the contents of the message and the BDS register overlayed;
   - Code 28: a BDS swap has been detected and the respective information has been discarded;
   - Code 29: the track has been updated while being in the zenithal gap (also referred to as “Cone of Silence”);
   - Code 30: the radar had lost track of an aircraft and subsequently re-acquired it.
   - Code 31: ???
   - Code 32: the transponder has used a wrong Downlink Format.
   - Code 33 & 34: reporting specific Transponder Anomalies.
   - Code 35 indicates that a plot has been obtained despite a high probability of an IC Conflict with another interrogator.
   - Code 36 indicates that a plot is in a configuration that it would be possible to detect an IC Conflict with another interrogator. Currently no potential IC Conflict has been detected. NOTE: Although implementation dependent, the use of this code should be limited to the target acquisition phase.
6. Together with Codes 35 and 36 the possibility to communicate the area within which the detection of an IC Conflict is possible was implemented in the Category 034 Specification [Ref. 8] by means of Message Type 008.
7. The use of this Data Item is implementation specific and shall be described in the ICD of the system generating the Category 048 target reports.

I007/040 - Measured Position in Polar Co-ordinates

definition: Measured position of an aircraft in local polar co-ordinates.

Group

I007/040/RHO

Element
bit size: 16
Unsigned quantity
LSB = $1/2^8$ NM ≈ $3.90625e-3$ NM
unit: ”NM”
< 256.0

I007/040/THETA

Element
bit size: 16
Unsigned quantity
LSB = $360/2^16$ ° ≈ $5.4931640625e-3$ °
unit: ”°”

Notes:

1. In case of no detection, the extrapolated position expressed in slant polar co-ordinates may be sent, except for a track cancellation message. No detection is signalled by the TYP field set to zero in I007/020 Target Report Descriptor.
2. This item represents the measured target position of the plot, even if associated with a track, for the present antenna scan. It is expressed in polar co-ordinates in the local reference system, centred on the radar station.
3. In case of combined detection by a PSR and an SSR, then the SSR position is sent.
4. For targets having a range beyond 256 NM the data item “Extended Range Report” has been added to the Reserved Expansion Field of category 007. The presence of this data item is indicated by the ERR bit set to one in data item I007/020, first extension. The ERR data item shall only be sent if the value of RHO is equal to or greater than 256NM. Please note that if this data item is used, the Encoding Rule to data item I007/040 still applies, meaning that the extra item in the Reserved Expansion Field shall be transmitted in addition to data item I007/040. If the Extended Range Report item in the Reserved Expansion Field is used, it is recommended to set the value of RHO in data item I007/040 to its maximum, meaning bits 32/17 all set to 1.

I007/042 - Calculated Position in Cartesian Co-ordinates

definition: Calculated position of an aircraft in Cartesian co-ordinates.

Group

I007/042/X - X-Component

Element
bit size: 16
Signed quantity
LSB = $1/2^7$ NM ≈ $7.8125e-3$ NM
unit: ”NM”
>= -256.0
<= 256.0

I007/042/Y - Y-Component

Element
bit size: 16
Signed quantity
LSB = $1/2^7$ NM ≈ $7.8125e-3$ NM
unit: ”NM”
>= -256.0
<= 256.0

I007/050 - Mode-2 Code in Octal Representation

definition: Reply to Mode-2 interrogation.

Group

I007/050/V

Element
bit size: 1
Values:

0: Code validated
1: Code not validated

I007/050/G

Element
bit size: 1
Values:

0: Default
1: Garbled code

I007/050/L

Element
bit size: 1
Values:

0: Mode-2 code as derived from the reply of the transponder
1: Smoothed Mode-2 code as provided by a local tracker

Spare bits: 1

I007/050/MODE2 - Mode-2 Code in Octal Representation

Element
bit size: 12
Octal string (3-bits per char)

Note:

- Bit 15 has no meaning in the case of a smoothed Mode-2 and is set to 0 for a calculated track.

Note:

- For radar systems interrogation with various technologies (such as military radars interrogating in Mode S and Mode 5), element I007/REF/GEN07/ALTM2 provides the possibility to transmit an alternative Mode-2 value. If this Data Item carries a Mode-2 value that has been derived from a Mode 5 Reply/Report, then bit-4 in I007/REF/MD5/SF#1 and bit-4 in I007/REF/M5N/SF#1 shall be set to 1.

I007/055 - Mode-1 Code in Octal Representation

definition: Reply to Mode-1 interrogation.

Group

I007/055/V

Element
bit size: 1
Values:

0: Code validated
1: Code not validated

I007/055/G

Element
bit size: 1
Values:

0: Default

1: Garbled code

I007/055/L

Element
bit size: 1
Values:

0: Mode-1 code as derived from the reply of the transponder
1: Smoothed Mode-1 code as provided by a local tracker

I007/055/MODE1 - Mode-1 Code

Element
bit size: 5
Raw Content

Notes:

1. Bit 7 has no meaning in the case of a smoothed Mode-1 and is set to 0 for a calculated track.
2. The values of the bits for V, G, L, A4, A2, A1, B2 and B1 shall be identical to the values of the corresponding bits in subfield #5 of data item “MD5 – Mode 5 Reports” and in subfield #5 of data item “MD5 – Mode 5 Reports, New Format” in the Reserved Expansion Field.

I007/060 - Mode-2 Code Confidence Indicator

definition: Confidence level for each bit of a Mode-2 reply as provided by a monopulse SSR station.

Group

Spare bits: 4

I007/060/QA4

Element
bit size: 1
Values:

0: High quality pulse A4
1: Low quality pulse A4

I007/060/QA2

Element
bit size: 1
Values:

0: High quality pulse A2
1: Low quality pulse A2

I007/060/QA1

Element
bit size: 1
Values:

0: High quality pulse A1
1: Low quality pulse A1

I007/060/QB4

Element
bit size: 1
Values:

0: High quality pulse B4
1: Low quality pulse B4

I007/060/QB2

Element
bit size: 1
Values:

0: High quality pulse B2
1: Low quality pulse B2

I007/060/QB1

Element
bit size: 1
Values:

0: High quality pulse B1
1: Low quality pulse B1

I007/060/QC4

Element
bit size: 1
Values:

0: High quality pulse C4
1: Low quality pulse C4

I007/060/QC2

Element
bit size: 1
Values:

0: High quality pulse C2
1: Low quality pulse C2

I007/060/QC1

Element
bit size: 1
Values:

0: High quality pulse C1
1: Low quality pulse C1

I007/060/QD4

Element
bit size: 1
Values:

0: High quality pulse D4
1: Low quality pulse D4

I007/060/QD2

Element
bit size: 1
Values:

0: High quality pulse D2
1: Low quality pulse D2

I007/060/QD1

Element
bit size: 1
Values:

0: High quality pulse D1
1: Low quality pulse D1

I007/065 - Mode-1 Code Confidence Indicator

definition: Confidence level for each bit of a Mode-1 reply as provided by a monopulse SSR station.

Group

Spare bits: 3

I007/065/QA4

Element
bit size: 1
Values:

- **0:** High quality pulse A4
- **1:** Low quality pulse A4

I007/065/QA2

Element
bit size: 1
Values:

- **0:** High quality pulse A2
- **1:** Low quality pulse A2

I007/065/QA1

Element
bit size: 1
Values:

- **0:** High quality pulse A1
- **1:** Low quality pulse A1

I007/065/QB2

Element
bit size: 1
Values:

- **0:** High quality pulse B2
- **1:** Low quality pulse B2

I007/065/QB1

Element
bit size: 1
Values:

- **0:** High quality pulse B1
- **1:** Low quality pulse B1

I007/070 - Mode-3/A Code in Octal Representation

definition: Mode-3/A code converted into octal representation.

Group

I007/070/V

Element
bit size: 1
Values:

- **0:** Code validated
- **1:** Code not validated

I007/070/G

Element
bit size: 1
Values:

- **0:** Default
- **1:** Garbled code

I007/070/L

Element
bit size: 1
Values:

0: Mode-3/A code derived from the reply of the transponder
1: Mode-3/A code not extracted during the last scan

Spare bits: 1

I007/070/MODE3A - Mode-3/A Reply in Octal Representation

Element
bit size: 12
Octal string (3-bits per char)

Notes:

1. Bit 15 has no meaning in the case of a smoothed Mode-3/A code and is set to 0 for a calculated track. For Mode S, it is set to one when an error correction has been attempted.
2. For Mode S, bit 16 is normally set to zero, but can exceptionally be set to one to indicate a non-validated Mode-3/A code (e.g. alert condition detected, but new Mode-3/A code not successfully extracted).
3. For radar systems interrogation with various technologies (such as military radars interrogating in Mode S and Mode 5), element I007/REF/GEN07/ALTM3 provides the possibility to transmit an alternative Mode-3/A value. If this Data Item carries a Mode-3/A value that has been derived from a Mode 5 Reply/Report, then bit-3 in I007/REF/MD5/SF#1 or bit-3 in I048/REF/M5N/SF#1 shall be set to 1.

I007/080 - Mode-3/A Code Confidence Indicator

definition: Confidence level for each bit of a Mode-3/A reply as provided by a monopulse SSR station.

Group

Spare bits: 4

I007/080/QA4

Element
bit size: 1
Values:
0: High quality pulse A4
1: Low quality pulse A4

I007/080/QA2

Element
bit size: 1
Values:
0: High quality pulse A2
1: Low quality pulse A2

I007/080/QA1

Element
bit size: 1
Values:
0: High quality pulse A1
1: Low quality pulse A1

I007/080/QB4

Element
bit size: 1
Values:
0: High quality pulse B4
1: Low quality pulse B4

I007/080/QB2

Element
bit size: 1
Values:

0: High quality pulse B2
1: Low quality pulse B2

I007/080/QB1

Element
bit size: 1
Values:

0: High quality pulse B1
1: Low quality pulse B1

I007/080/QC4

Element
bit size: 1
Values:

0: High quality pulse C4
1: Low quality pulse C4

I007/080/QC2

Element
bit size: 1
Values:

0: High quality pulse C2
1: Low quality pulse C2

I007/080/QC1

Element
bit size: 1
Values:

0: High quality pulse C1
1: Low quality pulse C1

I007/080/QD4

Element
bit size: 1
Values:

0: High quality pulse D4
1: Low quality pulse D4

I007/080/QD2

Element
bit size: 1
Values:

0: High quality pulse D2
1: Low quality pulse D2

I007/080/QD1

Element
bit size: 1
Values:

0: High quality pulse D1
1: Low quality pulse D1

I007/085 - Mode 5, Extended Mode 1 and X-Pulse

Compound

I007/085/SUM - Subfield #1: Mode 5 Summary

Group

I007/085/SUM/M5

Element
bit size: 1
Values:

0: No Mode 5 interrogation
1: Mode 5 interrogation

I007/085/SUM/ID

Element
bit size: 1
Values:

0: No authenticated Mode 5 ID reply
1: Authenticated Mode 5 ID reply

I007/085/SUM/DA

Element
bit size: 1
Values:

0: No authenticated Mode 5 Data reply or Report
1: Authenticated Mode 5 Data reply or Report (i.e any valid Mode 5 reply type other than ID)

I007/085/SUM/M1

Element
bit size: 1
Values:

0: Mode 1 code not present or not from Mode 5 reply
1: Mode 1 code from Mode 5 reply

I007/085/SUM/M2

Element
bit size: 1
Values:

0: Mode 2 code not present or not from Mode 5 reply
1: Mode 2 code from Mode 5 reply

I007/085/SUM/M3

Element
bit size: 1
Values:

0: Mode 3 code not present or not from Mode 5 reply
1: Mode 3 code from Mode 5 reply

I007/085/SUM/MC

Element
bit size: 1
Values:

0: Mode C altitude not present or not from Mode 5 reply
1: Mode C altitude from Mode 5 reply

Spare bits: 1

I007/085/PMN - Subfield #2: Mode 5 PIN/National Origin/Mission Code

Group

Spare bits: 2

I007/085/PMN/PIN - PIN Code

Element
bit size: 14
Raw Content

Spare bits: 3

I007/085/PMN/NAT - National Origin

Element
bit size: 5
Raw Content

Spare bits: 2

I007/085/PMN/MIS - Mission Code

Element
bit size: 6
Raw Content

I007/085/POS - Subfield #3: Mode 5 Reported Position

Group

I007/085/POS/LAT - Latitude in WGS 84

Element
bit size: 24
Signed quantity
LSB = $180/2^{23}$ ° ≈ $2.1457672119140625e-5$ °
unit: ”°”
>= -90.0
<= 90.0

I007/085/POS/LON - Longitude in WGS 84

Element
bit size: 24
Signed quantity
LSB = $180/2^{23}$ ° ≈ $2.1457672119140625e-5$ °
unit: ”°”
>= -180.0
< 180.0

I007/085/GA - Subfield #4: Mode 5 GNSS-derived Altitude

Group

Spare bits: 1

I007/085/GA/RES - Resolution with which the GNSS-derived Altitude (GA) is Reported

Element
bit size: 1
Values:

0: GA reported in 100 ft increments
1: GA reported in 25 ft increments

I007/085/GA/GA - GNSS-derived Altitude of Target, Expressed as Height Above WGS 84 Ellipsoid

Element
bit size: 14
Signed quantity
LSB = 25 ft ≈ 25.0 ft
unit: ”ft”
>= -1000.0

I007/085/EM1 - Subfield #5: Extended Mode 1 Code in Octal Representation

Group

I007/085/EM1/V

Element
bit size: 1
Values:

0: Code not validated
1: Code validated

I007/085/EM1/G

Element
bit size: 1
Values:

0: Default
1: Garbled code

I007/085/EM1/L

Element
bit size: 1
Values:

0: Mode-1 code derived from the reply of the transponder
1: Mode-1 code not extracted during the last scan

Spare bits: 1

I007/085/EM1/EM1 - Extended Mode 1 Code in Octal Representation

Element
bit size: 12
Octal string (3-bits per char)

I007/085/TOS - Subfield #6: Time Offset for POS and GA

Element
bit size: 8
Signed quantity
LSB = $1/2^7$ s ≈ $7.8125e-3$ s
unit: "s"

I007/085/XP - Subfield #7: X Pulse Presence

Group

Spare bits: 3

I007/085/XP/X5 - X-pulse from Mode 5 Data Reply or Report

Element
bit size: 1
Values:

0: X-pulse set to zero or no authenticated Data reply or Report received
1: X-pulse set to one (present)

I007/085/XP/XC - X-pulse from Mode C Reply

Element
bit size: 1
Values:

0: X-pulse set to zero or no Mode C reply
1: X-pulse set to one (present)

I007/085/XP/X3 - X-pulse from Mode 3/A Reply

Element
bit size: 1
Values:

0: X-pulse set to zero or no Mode 3/A reply
1: X-pulse set to one (present)

I007/085/XP/X2 - X-pulse from Mode 2 Reply

Element
bit size: 1
Values:

0: X-pulse set to zero or no Mode 2 reply

1: X-pulse set to one (present)

I007/085/XP/X1 - X-pulse from Mode 1 Reply

Element
bit size: 1
Values:

0: X-pulse set to zero or no Mode 1 reply
1: X-pulse set to one (present)

I007/090 - Flight Level in Binary Representation

definition: Flight Level converted into binary representation.

Group

I007/090/V

Element
bit size: 1
Values:

0: Code validated
1: Code not validated

I007/090/G

Element
bit size: 1
Values:

0: Default
1: Garbled code

I007/090/FL - Flight Level

Element
bit size: 14
Signed quantity
LSB = $1/2^2$ FL ≈ 0.25 FL
unit: "FL"

Notes:

1. When Mode C code / Mode S altitude code is present but not decodable, the "Undecodable Mode C code / Mode S altitude code" Warning/Error should be sent in I007/030.
2. When local tracking is applied and the received Mode C code / Mode S altitude code corresponds to an abnormal value (the variation with the previous plot is estimated too important by the tracker), the "Mode C code / Mode S altitude code abnormal value compared to the track" Warning/Error should be sent in I007/030.
3. The value shall be within the range described by ICAO Annex 10
4. For Mode S, bit 15 (G) is set to one when an error correction has been attempted.
5. For radar systems interrogating with various technologies (such as military radars interrogating in Mode S and Mode 5), element I007/REF/GEN07/ALTFL provides the possibility to transmit an alternative Flight Level value. If this Data Item carries a Flight Level value that has been derived from a Mode 5 Reply/Report, then bit-2 in I007/REF/MD5/SF#1 and in bit-2 in I007/REF/M5N/SF#1 shall be set to 1.

I007/100 - Mode-C Code and Code Confidence Indicator

definition: Mode-C height in Gray notation as received from the transponder together with the confidence level for each reply bit as provided by a MSSR/Mode S station.

Group

I007/100/V

Element
bit size: 1
Values:

0: Code validated
1: Code not validated

I007/100/G

Element
bit size: 1
Values:

0: Default
1: Garbled code

Spare bits: 2

I007/100/MODEC - Mode-C Reply in Gray Notation

Element
bit size: 12
Raw Content

Spare bits: 4

I007/100/QC1

Element
bit size: 1
Values:

0: High quality pulse C1
1: Low quality pulse C1

I007/100/QA1

Element
bit size: 1
Values:

0: High quality pulse A1
1: Low quality pulse A1

I007/100/QC2

Element
bit size: 1
Values:

0: High quality pulse C2
1: Low quality pulse C2

I007/100/QA2

Element
bit size: 1
Values:

0: High quality pulse A2
1: Low quality pulse A2

I007/100/QC4

Element
bit size: 1
Values:

0: High quality pulse C4
1: Low quality pulse C4

I007/100/QA4

Element
bit size: 1
Values:

0: High quality pulse A4
1: Low quality pulse A4

I007/100/QB1

Element
bit size: 1
Values:

0: High quality pulse B1
1: Low quality pulse B1

I007/100/QD1

Element
bit size: 1
Values:

0: High quality pulse D1
1: Low quality pulse D1

I007/100/QB2

Element
bit size: 1
Values:

0: High quality pulse B2
1: Low quality pulse B2

I007/100/QD2

Element
bit size: 1
Values:

0: High quality pulse D2
1: Low quality pulse D2

I007/100/QB4

Element
bit size: 1
Values:

0: High quality pulse B4
1: Low quality pulse B4

I007/100/QD4

Element
bit size: 1
Values:

0: High quality pulse D4
1: Low quality pulse D4

Notes:

1. For Mode S, D1 is also designated as Q, and is used to denote either 25ft or 100ft reporting.
2. For Mode S, bit-31 (G) is set when an error correction has been attempted.

I007/110 - Height Measured by a 3D Radar

definition: Height of a target as measured by a 3D radar. The height shall use mean sea level as the zero reference level.

Group

Spare bits: 2

I007/110/3DH - 3D-Height

Element
bit size: 14
Signed quantity
LSB = 25 ft ≈ 25.0 ft
unit: ”ft”

I007/120 - Radial Doppler Speed

definition: Information on the Doppler Speed of the target report.

Compound

I007/120/CAL - Subfield #1: Calculated Doppler Speed

Group

I007/120/CAL/D

Element
bit size: 1
Values:

- **0:** Doppler speed is valid
- **1:** Doppler speed is doubtful

Spare bits: 5

I007/120/CAL/CAL - Calculated Doppler Speed

Element
bit size: 10
Signed quantity
LSB = 1 m/s ≈ 1.0 m/s
unit: ”m/s”

I007/120/RDS - Subfield #2: Raw Doppler Speed

Repetitive
Regular, 1 byte(s) REP field size.
Group

I007/120/RDS/DOP - Doppler Speed

Element
bit size: 16
Unsigned quantity
LSB = 1 m/s ≈ 1.0 m/s
unit: ”m/s”

I007/120/RDS/AMB - Ambiguity Range

Element
bit size: 16
Unsigned quantity
LSB = 1 m/s ≈ 1.0 m/s
unit: ”m/s”

I007/120/RDS/FRQ - Transmitter Frequency

Element
bit size: 16
Unsigned quantity
LSB = 1 MHz ≈ 1.0 MHz
unit: ”MHz”

I007/130 - Radar Plot Characteristics

definition: Additional information on the quality of the target report.

Compound

I007/130/SRL - Subfield #1: SSR Plot Runlength

Element
bit size: 8
Unsigned quantity
LSB = $360/2^{1}3$ ° ≈ $4.39453125e-2$ °
unit: ”°”

I007/130/SRR - Subfield #2: Number of Received Replies for (M)SSR

Element
bit size: 8
Unsigned integer

I007/130/SAM - Subfield #3: Amplitude of Received Replies for (M)SSR

Element
bit size: 8
Signed quantity
LSB = 1 dBm ≈ 1.0 dBm
unit: ”dBm”

I007/130/PRL - Subfield #4: PSR Plot Runlength

Element
bit size: 8
Unsigned quantity
LSB = $360/2^{1}3$ ° ≈ $4.39453125e-2$ °
unit: ”°”

I007/130/PAM - Subfield #5: PSR Amplitude

Element
bit size: 8
Signed quantity
LSB = 1 dBm ≈ 1.0 dBm
unit: ”dBm”

I007/130/RPD - Subfield #6: Difference in Range Between PSR and SSR Plot

Element
bit size: 8
Signed quantity
LSB = $1/2^{8}$ NM ≈ $3.90625e-3$ NM
unit: ”NM”

I007/130/APD - Subfield #7: Difference in Azimuth Between PSR and SSR Plot

Element
bit size: 8
Signed quantity
LSB = $360/2^{1}4$ ° ≈ $2.197265625e-2$ °
unit: ”°”

Notes:

1. The total range covered is therefore from 0 to 11.21 °.
2. Negative values are coded in two's complement form.
3. The total range covered is therefore from 0 to 11.21 °.
4. Negative values are coded in two's complement form.
5. Negative values are coded in two's complement form.
6. The covered range difference is +/- 0.5 NM.
7. Sending the maximum value means that the difference in range is equal or greater than the maximum value.
8. Negative values are coded in two's complement form.
9. The covered azimuth difference is +/-360/2 7 = +/- 2.8125 °.
10. Sending the maximum value means that the difference in range is equal or greater than the maximum value.

I007/140 - Time of Day

definition: Absolute time stamping expressed as Co-ordinated Universal Time (UTC).

Element
bit size: 24
Unsigned quantity
LSB = $1/2^7$ s ≈ $7.8125e-3$ s
unit: ”s”
< 86400.0

Notes:

1. The time of day value is reset to 0 each day at midnight.
2. Every radar station using ASTERIX should be equipped with at least one synchronised time source

I007/161 - Track Number

definition: An integer value representing a unique reference to a track record within a particular track file.

Group

Spare bits: 4

I007/161/TN - Track Number

Element
bit size: 12
Raw Content

I007/170 - Track Status

definition: Status of monoradar track (PSR and/or SSR updated).

Extended

I007/170/CNF - Confirmed Vs. Tentative Track

Element
bit size: 1
Values:

0: Confirmed Track
1: Tentative Track

I007/170/RAD - Type of Sensor(s) Maintaining Track

Element
bit size: 2
Values:

0: Combined Track
1: PSR Track
2: SSR/Mode S Track
3: Invalid

I007/170/DOU - Signals Level of Confidence in Plot to Track Association Process

Element
bit size: 1
Values:

0: Normal confidence
1: Low confidence in plot to track association

I007/170/MAH - Manoeuvre Detection in Horizontal Sense

Element
bit size: 1
Values:

0: No horizontal manoeuvre sensed
1: Horizontal manoeuvre sensed

I007/170/CDM - Climbing/Descending Mode

Element
bit size: 2
Values:

0: Maintaining
1: Climbing
2: Descending
3: Unknown

(FX) - extension bit

I007/170/TRE - Signal for End_of_Track

Element
bit size: 1
Values:

0: Track still alive
1: End of track lifetime (last report for this track)

I007/170/GHO - Ghost Vs. True Target

Element
bit size: 1
Values:

0: True target track
1: Ghost target track

I007/170/SUP - Track Maintained with Track Information from Neighbouring Node B on the Cluster, or Network

Element
bit size: 1
Values:

0: No
1: Yes

I007/170/TCC - Type of Plot Coordinate Transformation Mechanism

Element
bit size: 1
Values:

0: Tracking performed in so-called 'Radar Plane', i.e. neither slant range correction nor stereographical projection was applied
1: Slant range correction and a suitable projection technique are used to track in a 2D reference plane, tangential to the earth model at the Radar Site co-ordinates

Spare bits: 3
(FX) - extension bit

I007/200 - Calculated Track Velocity in Polar Co-ordinates

definition: Calculated track velocity expressed in polar co-ordinates.
Group

I007/200/GSP - Calculated Groundspeed

Element
bit size: 16
Unsigned quantity
LSB = $1/2^14$ NM/s ≈ $6.103515625e-5$ NM/s
unit: ”NM/s”

I007/200/HDG - Calculated Heading

Element
bit size: 16
Unsigned quantity
LSB = $360/2^16$ ° ≈ $5.4931640625e-3$ °
unit: ”°”

Notes:

- The calculated heading is related to the geographical North at the aircraft position.

I007/210 - Track Quality

definition: Track quality in the form of a vector of standard deviations.

Group

I007/210/SIGX - Standard Deviation on the Horizontal Axis of the Local Grid System

Element
bit size: 8
Unsigned quantity
LSB = $1/2^7$ NM ≈ $7.8125e-3$ NM
unit: ”NM”

I007/210/SIGY - Standard Deviation on the Vertical Axis of the Local Grid System

Element
bit size: 8
Unsigned quantity
LSB = $1/2^7$ NM ≈ $7.8125e-3$ NM
unit: ”NM”

I007/210/SIGV - Standard Deviation on the Groundspeed Within the Local Grid System

Element
bit size: 8
Unsigned quantity
LSB = $1/2^14$ NM/s ≈ $6.103515625e-5$ NM/s
unit: ”NM/s”

I007/210/SIGH - Standard Deviation on the Heading Within the Local Grid System

Element
bit size: 8
Unsigned quantity
LSB = $360/2^12$ ° ≈ $8.7890625e-2$ °
unit: ”°”

Notes:

1. The standard deviation is per definition a positive value, hence the range covered is : 0 <= Sigma(X) < 2 NM
2. The standard deviation is per definition a positive value, hence the range covered is : 0 <= Sigma(Y) < 2 NM

3. The standard deviation is per definition a positive value, hence the range covered is: 0 <= Sigma (V) < 56.25 Kt
4. The standard deviation is per definition a positive value; hence the range covered is: 0 <= sigma (H) < 22.5 degrees.

I007/220 - Aircraft Address

definition: Aircraft address (24-bits Mode S address) assigned uniquely to each aircraft.

Element
bit size: 24
Raw Content

I007/230 - Communications/ACAS Capability and Flight Status

definition: Communications capability of the transponder, capability of the on-board ACAS equipment and flight status.

Group

I007/230/COM - Communications Capability of the Transponder

Element
bit size: 3
Values:

0: No communications capability (surveillance only)
1: Comm. A and Comm. B capability
2: Comm. A, Comm. B and Uplink ELM
3: Comm. A, Comm. B, Uplink ELM and Downlink ELM
4: Level 5 Transponder capability
5: Not Assigned
6: Not Assigned
7: Not Assigned

I007/230/STAT - Flight Status

Element
bit size: 3
Values:

0: No alert, no SPI, aircraft airborne
1: No alert, no SPI, aircraft on ground
2: Alert, no SPI, aircraft airborne
3: Alert, no SPI, aircraft on ground
4: Alert, SPI, aircraft airborne or on ground
5: No alert, SPI, aircraft airborne or on ground
6: Not Assigned
7: Unknown

I007/230/SI - SI/II Transponder Capability

Element
bit size: 1
Values:

0: SI-Code Capable
1: II-Code Capable

Spare bits: 1

I007/230/MSSC - Mode-S Specific Service Capability

Element
bit size: 1
Values:

0: No

1: Yes

I007/230/ARC - Altitude Reporting Capability

Element
bit size: 1
Values:

0: 100 ft resolution
1: 25 ft resolution

I007/230/AIC - Aircraft Identification Capability

Element
bit size: 1
Values:

0: No
1: Yes

I007/230/B1A - BDS 1,0 Bit 16

Element
bit size: 1
Raw Content

I007/230/B1B - BDS 1,0 Bits 37/40

Element
bit size: 4
Raw Content

Note:

- This item shall be present in every ASTERIX record conveying data related to a Mode S target. If the datalink capability has not been extracted yet, bits 16/14 shall be set to zero.

I007/240 - Aircraft Identification

definition: Aircraft identification (in 8 characters) obtained from an aircraft equipped with a Mode S transponder.

Element
bit size: 48
ICAO string (6-bits per char)

Notes:

1. This data item contains the flight identification as available in the respective Mode S transponder registers.

I007/250 - Mode S MB Data

definition: Mode S Comm B data as extracted from the aircraft transponder.

Repetitive

Regular, 1 byte(s) REP field size.

Group

I007/250/MBDATA - Mode S Comm B Message Data

Element
bit size: 56
Raw Content

I007/250/BDS1 - Comm B Data Buffer Store 1 Address

Element
bit size: 4
Raw Content

I007/250/BDS2 - Comm B Data Buffer Store 2 Address

Element
bit size: 4
Raw Content

Notes:

1. For the transmission of BDS Register 2,0, Data Item I007/240 is used.
2. For the transmission of BDS Register 3,0, Data Item I007/260 is used.
3. In case of data extracted via Comm-B broadcast, all bits of fields BDS1 and BDS2 are set to 0; in case of data extracted via GICB requests, the fields BDS1 and BDS2 correspond to the GICB register number.

I007/260 - ACAS Resolution Advisory Report

definition: Currently active Resolution Advisory (RA), if any, generated by the ACAS associated with the transponder transmitting the report and threat identity data.

Element
bit size: 56
Raw Content

Notes:

1. Refer to ICAO Draft SARPs for ACAS for detailed explanations.

I007/400 - Directed Interrogation Request Number

definition: Directed interrogation request number

Group

I007/400/PRI - Priority of Command

Element
bit size: 1
Values:

0: Normal Priority, surveillance function has priority
1: High Priority, Directed interrogation has priority over surveillance

I007/400/RN - Request Number

Element
bit size: 15
Raw Content

Notes:

1. The Request Number is created by the client, which directs the sensor to perform an interrogation.
2. The sensor will use the same request number for all subsequent messages related to the respective directed interrogation.
3. The sensor will not accept a request numbere which is currently processed.
4. In some cases (e.g. overlapping of directed interrogation windows with partially equal mode combinations) the sensor cannot determine which request number to assign to target reports due to ambiguity. In this case one matching request number will be used and the sensor has to generate an ”ambiguous acknowledge” message when accepting the command.

5. A value of 0 for the Request Number will cause an Interrogation reject by the sensor. Therefore, the Request Number shall always be greater than or equal to 1.

I007/410 - Directed Interrogation Message Type

definition: Directed interrogation message type

Element
bit size: 8
Values:

- **0:** Acknowledge
- **1:** Reject
- **2:** Interrogation Finished
- **3:** Interrogation Completed
- **4:** Target Report
- **5:** Interrogation Request Type A
- **6:** Interrogation Request Type B
- **7:** Interrogation Request Type C
- **8:** Selective BDS-Register Request

Notes:

1. Using the Acknowledge the sensor will confirm the receipt of the directed interrogation command.
2. After the sensor has completed the interrogation, i.e. the interrogations are transmitted, the sensor will report an Interrogation Finished message.
3. When no further targets for a directed interrogation are expected, an Interrogation Completed message will be issued by the interrogator.
4. Although each Directed Interrogation should result in exactly one target report, cases may occur resulting in error conditions. These potential error conditions are signalled with item I007/030.

I007/415 - Required Interrogation Modes

definition: Directed Interrogation MIPs

Compound

Spare
Spare
Spare
Spare
Spare

I007/415/RIM - Subfield #1: Required Interrogation Modes

Group

Spare bits: 7

I007/415/RIM/LO - Lockout Override

Element
bit size: 1
Values:

- **0:** No lockout override
- **1:** Lockout override

I007/415/RIM/MSPROB - Probability of Reply If Mode S UF11 or Combined Modes Are Used

Element
bit size: 3
Values:

0: 1
1: 1/2
2: 1/4
3: 1/8
4: 1/16

I007/415/RIM/M5FORMAT - Mode 5 Format

Element
bit size: 5
Raw Content

I007/415/RIM/M4CS - Mode 4 Code Selection

Element
bit size: 2
Values:

0: Code A
1: Code B
2: Defined by sensor

I007/415/RIM/M5S - M5_SUPERMODE_S

Element
bit size: 1
Raw Content

I007/415/RIM/SM5S - M5_SUPERMODE_S

Element
bit size: 1
Raw Content

I007/415/RIM/SM54 - M5_SUPERMODE_4

Element
bit size: 1
Raw Content

I007/415/RIM/SM5C - M5_SUPERMODE_C

Element
bit size: 1
Raw Content

I007/415/RIM/SM53 - M5_SUPERMODE_3A

Element
bit size: 1
Raw Content

I007/415/RIM/SM52 - M5_SUPERMODE_2

Element
bit size: 1
Raw Content

I007/415/RIM/SM51 - M5_SUPERMODE_1

Element
bit size: 1
Raw Content

Spare bits: 1

I007/415/RIM/M5 - MODE_5

Element
bit size: 1
Raw Content

I007/415/RIM/RCMA - MODE S ROLL_CALL

Element
bit size: 1
Raw Content

I007/415/RIM/RCMC - MODE S ROLL_CALL

Element
bit size: 1
Raw Content

I007/415/RIM/CMC - COMBINED_C

Element
bit size: 1
Raw Content

I007/415/RIM/CM3A - COMBINED_3A

Element
bit size: 1
Raw Content

I007/415/RIM/MS - MODE_S

Element
bit size: 1
Raw Content

I007/415/RIM/M4S - M4_SUPERMODE_

Element
bit size: 1
Raw Content

I007/415/RIM/SMC - SUPERMODE_C

Element
bit size: 1
Raw Content

I007/415/RIM/SM3A - SUPERMODE_3A

Element
bit size: 1
Raw Content

I007/415/RIM/SM2 - SUPERMODE_2

Element
bit size: 1
Raw Content

I007/415/RIM/SM1 - SUPERMODE_1

Element
bit size: 1
Raw Content

I007/415/RIM/MCO - MODE_C_ONLY

Element
bit size: 1
Raw Content

I007/415/RIM/M3O - MODE_3A_ONLY

Element
bit size: 1
Raw Content

I007/415/RIM/MCS - MODE_C_S

Element
bit size: 1
Raw Content

I007/415/RIM/M3S - MODE_3A_S

Element
bit size: 1
Raw Content

I007/415/RIM/MD - MODE_D

Element
bit size: 1
Raw Content

I007/415/RIM/MC - MODE_C

Element
bit size: 1
Raw Content

I007/415/RIM/MB - MODE_B

Element
bit size: 1
Raw Content

I007/415/RIM/M4 - MODE_4

Element
bit size: 1
Raw Content

I007/415/RIM/M3A - MODE_3A

Element
bit size: 1
Raw Content

I007/415/RIM/M2 - MODE_2

Element
bit size: 1
Raw Content

I007/415/RIM/M1 - MODE_1

Element
bit size: 1
Raw Content

I007/415/MIPT - Subfield #2: MIP Table

Element
bit size: 8
Raw Content

I007/420 - Directed Interrogation Window

definition: Geographical window defined in polar co-ordinates
Group

I007/420/RS - Rho-Start

Element
bit size: 16
Unsigned quantity
LSB = $1/2^8$ NM $\approx 3.90625e-3$ NM
unit: "NM"
< 256.0

I007/420/RE - Rho-End

Element
bit size: 16
Unsigned quantity
LSB = $1/2^8$ NM $\approx 3.90625e-3$ NM
unit: "NM"
< 256.0

I007/420/TS - Theta-Start

Element
bit size: 16
Unsigned quantity
LSB = $360/2^16$ ° $\approx 5.4931640625e-3$ °
unit: "°"

I007/420/TE - Theta-End

Element
bit size: 16
Unsigned quantity
LSB = $360/2^16$ ° $\approx 5.4931640625e-3$ °
unit: "°"

Notes:

1. When present, this window defines the area which should be interrogated and for which the target reports are expected.
2. The sensor shall use this window to determine the azimuth range for the directed interrogation.
3. The sensor may use this window to tag the extracted targets within this window with the request number.
4. In case multiple request windows overlap, the sensor may respond with an Ambiguous Acknowledge. It shall be noted, that internally generated expectation windows for directed interrogations related to targets/tracks may also lead to Ambiguous Acknowledge Responses.
5. The target window is meant within a NE related coordinated system with the point of origin at the radar head.

I007/440 - Directed Interrogation BDS Register Request

definition: Directed Interrogation BDS Register Request

Repetitive

Regular, 1 byte(s) REP field size.

Group

I007/440/BDS1 - Comm B Data Buffer Store 1 Address

Element
bit size: 4
Raw Content

I007/440/BDS2 - Comm B Data Buffer Store 2 Address

Element
bit size: 4
Raw Content

Notes:

1. A Directed Interrogation BDS request will only be performed once. If it is not successful it will not be repeated automatically but has to be re-ordered.

I007/450 - Directed Interrogation Result

definition: Directed Interrogation Result

Compound

I007/450/TR - Subfield #1: Truncation

Group

Spare bits: 4

I007/450/TR/N - Interrogation Was Not Executed

Element
bit size: 1
Raw Content

I007/450/TR/T - Interrogation Scheduler Has Truncated the All Call Request

Element
bit size: 1
Raw Content

I007/450/TR/A - Interrogation Scheduler Has Activated the Request At Least Once

Element
bit size: 1
Raw Content

I007/450/TR/C - Interrogation Scheduler Has Activated the Request During All Its Validity

Element
bit size: 1
Raw Content

I007/450/M4 - Subfield #2: Mode 4 Interrogations

Element
bit size: 8
Raw Content

I007/450/M5 - Subfield #3: Mode 5 Interrogations

Element
bit size: 8
Raw Content

I007/450/MS - Subfield #4: Mode S All Call Interrogations

Group

Spare bits: 6

I007/450/MS/LO - Lockout

Element
bit size: 2
Values:

- **0:** No Lockout used by Interrogation Scheduler
- **1:** Lockout used by Interrogation Scheduler
- **2:** Lockout-Override applied

I007/450/MS/NB - Number of Mode S All Calls Performed for the Request

Element
bit size: 8
Raw Content

I007/450/MX - Subfield #5: Mark X Interrogations

Element
bit size: 8
Raw Content

I007/450/SMS - Subfield #6: Selective Mode S Interrogations

Element
bit size: 8
Raw Content

I007/REF - Reserved Expansion Field

Explicit (ReservedExpansion)

I007/SPF - Special Purpose Field

Explicit (SpecialPurpose)

User Application Profile

This category has multiple UAPs.

UAP selection is based on the value of: `410`

- `0`
  downlink
- `1`
  downlink
- `2`
  downlink
- `3`
  downlink
- `4`
  downlink
- `5`
  uplink
- `6`
  uplink
- `7`
  uplink
- `8`
  uplink

downlink

- 1: `I007/010` - Data Source Identifier
- 2: `I007/025` - Data Destination Identifier
- 3: `I007/410` - Directed Interrogation Message Type
- 4: `I007/140` - Time of Day
- 5: `I007/400` - Directed Interrogation Request Number
- 6: `I007/020` - Type and Properties of the Target Report and Target Capabilities
- 7: `I007/040` - Measured Position in Polar Co-ordinates
- (FX) - Field extension indicator
- 8: `I007/070` - Mode-3/A Code in Octal Representation
- 9: `I007/090` - Flight Level in Binary Representation
- 10: `I007/130` - Radar Plot Characteristics
- 11: `I007/220` - Aircraft Address
- 12: `I007/240` - Aircraft Identification
- 13: `I007/250` - Mode S MB Data
- 14: `I007/161` - Track Number
- (FX) - Field extension indicator
- 15: `I007/042` - Calculated Position in Cartesian Co-ordinates
- 16: `I007/200` - Calculated Track Velocity in Polar Co-ordinates
- 17: `I007/170` - Track Status
- 18: `I007/210` - Track Quality
- 19: `I007/030` - Warning/Error Conditions
- 20: `I007/080` - Mode-3/A Code Confidence Indicator
- 21: `I007/100` - Mode-C Code and Code Confidence Indicator
- (FX) - Field extension indicator
- 22: `I007/110` - Height Measured by a 3D Radar
- 23: `I007/120` - Radial Doppler Speed
- 24: `I007/230` - Communications/ACAS Capability and Flight Status
- 25: `I007/260` - ACAS Resolution Advisory Report
- 26: `I007/055` - Mode-1 Code in Octal Representation
- 27: `I007/050` - Mode-2 Code in Octal Representation
- 28: `I007/065` - Mode-1 Code Confidence Indicator
- (FX) - Field extension indicator
- 29: `I007/060` - Mode-2 Code Confidence Indicator
- 30: `I007/450` - Directed Interrogation Result
- 31: `I007/085` - Mode 5, Extended Mode 1 and X-Pulse
- *Spare*
- *Spare*
- 34: `I007/SPF` - Special Purpose Field
- 35: `I007/REF` - Reserved Expansion Field

- (FX) - Field extension indicator

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- 1: `I007/010` - Data Source Identifier
- 2: `I007/025` - Data Destination Identifier
- 3: `I007/410` - Directed Interrogation Message Type
- 4: `I007/140` - Time of Day
- 5: `I007/400` - Directed Interrogation Request Number
- 6: `I007/040` - Measured Position in Polar Co-ordinates
- 7: `I007/220` - Aircraft Address
- (FX) - Field extension indicator
- 8: `I007/161` - Track Number
- 9: `I007/042` - Calculated Position in Cartesian Co-ordinates
- 10: `I007/200` - Calculated Track Velocity in Polar Co-ordinates
- 11: `I007/415` - Required Interrogation Modes
- 12: `I007/420` - Directed Interrogation Window
- 13: `I007/440` - Directed Interrogation BDS Register Request
- *Spare*
- (FX) - Field extension indicator
- *Spare*
- *Spare*
- *Spare*
- *Spare*
- *Spare*
- 20: `I007/SPF` - Special Purpose Field
- 21: `I007/REF` - Reserved Expansion Field
- (FX) - Field extension indicator