Asterix category 062 - SDPS Track Messages

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Preamble

Surveillance data exchange.

Description of standard data items

I062/010 - Data Source Identifier

Definition: Identification of the system sending the data.

Structure:

> **I062/010/SAC** - *System Area Code*
>
> - 8 bits [. . . . .]
> - raw value
>
> **I062/010/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).

I062/015 - Service Identification

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

Structure:

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

I062/040 - Track Number

Definition: Identification of a track.

Structure:

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

I062/060 - Track Mode 3/A Code

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

Structure:

I062/060/V - *Validated*

- 1 bit [.]
- values:

    0: Code validated
    1: Code not validated

I062/060/G - *Garbled*

- 1 bit [.]
- values:

    0: Default
    1: Garbled code

I062/060/CH - *Change in Mode 3/A*

- 1 bit [.]
- values:

    0: No change
    1: Mode 3/A has changed

I062/060/(spare)

- 1 bit [.]

I062/060/MODE3A - *Mode-3/A Reply in Octal Representation*

- 12 bits [. . . . .]
- Octal string (3-bits per digit)

I062/070 - Time Of Track Information

Definition: Absolute time stamping of the information provided in the track message, in the form of elapsed time since last mid night, expressed as UTC.

Structure:

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

Notes:

1. This is the time of the track state vector.
2. The time is reset to zero at every midnight.

I062/080 - Track Status

Definition: Status of a track.

Structure:

Extended item.

I062/080/MON

- 1 bit [.]
- values:

    0: Multisensor track
    1: Monosensor track

I062/080/SPI

- 1 bit [.]
- values:

    0: Default value
    1: SPI present in the last report received from a sensor capable of decoding this data

I062/080/MRH - *Most Reliable Height*

- 1 bit [.]
- values:

    0: Barometric altitude (Mode C) more reliable
    1: Geometric altitude more reliable

I062/080/SRC - *Source of Calculated Track Altitude for I062/130*

- 3 bits [...]
- values:

    0: No source
    1: GNSS
    2: 3D radar
    3: Triangulation
    4: Height from coverage
    5: Speed look-up table
    6: Default height
    7: Multilateration

I062/080/CNF

- 1 bit [.]
- values:

    0: Confirmed track
    1: Tentative track

(FX)

- extension bit

    0: End of data item
    1: Extension into next extent

I062/080/SIM

- 1 bit [.]
- values:

0: Actual track
1: Simulated track

I062/080/TSE

- 1 bit [.]
- values:

   0: Default value
   1: Last message transmitted to the user for the track

I062/080/TSB

- 1 bit [.]
- values:

   0: Default value
   1: First message transmitted to the user for the track

I062/080/FPC

- 1 bit [.]
- values:

   0: Not flight-plan correlated
   1: Flight plan correlated

I062/080/AFF

- 1 bit [.]
- values:

   0: Default value
   1: ADS-B data inconsistent with other surveillance information

I062/080/STP

- 1 bit [.]
- values:

   0: Default value
   1: Slave Track Promotion

I062/080/KOS

- 1 bit [.]
- values:

   0: Complementary service used
   1: Background service used

(FX)

- extension bit

   0: End of data item
   1: Extension into next extent

I062/080/AMA

- 1 bit [.]
- values:

   0: Track not resulting from amalgamation process
   1: Track resulting from amalgamation process

I062/080/MD4

- 2 bits [..]
- values:

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

I062/080/ME

- 1 bit [.]
- values:

  0: Default value
  1: Military Emergency present in the last report received from a sensor capable of decoding this data

I062/080/MI

- 1 bit [.]
- values:

  0: Default value
  1: Military Identification present in the last report received from a sensor capable of decoding this data

I062/080/MD5

- 2 bits [..]
- values:

  0: No Mode 5 interrogation
  1: Friendly target
  2: Unknown target
  3: No reply

(FX)

- extension bit

  0: End of data item
  1: Extension into next extent

I062/080/CST

- 1 bit [.]
- values:

  0: Default value
  1: Age of the last received track update is higher than system dependent threshold (coasting)

I062/080/PSR

- 1 bit [.]
- values:

  0: Default value
  1: Age of the last received PSR track update is higher than system dependent threshold

I062/080/SSR

- 1 bit [.]
- values:

0: Default value

1: Age of the last received SSR track update is higher than system dependent threshold

I062/080/MDS

- 1 bit [.]

- values:

    0: Default value

    1: Age of the last received Mode S track update is higher than system dependent threshold

I062/080/ADS

- 1 bit [.]

- values:

    0: Default value

    1: Age of the last received ADS-B track update is higher than system dependent threshold

I062/080/SUC

- 1 bit [.]

- values:

    0: Default value

    1: Special Used Code (Mode A codes to be defined in the system to mark a track with special interest)

I062/080/AAC

- 1 bit [.]

- values:

    0: Default value

    1: Assigned Mode A Code Conflict (same discrete Mode A Code assigned to another track)

(FX)

- extension bit

    0: End of data item
    1: Extension into next extent

I062/080/SDS

- 2 bits [. .]

- values:

    0: Combined
    1: Co-operative only
    2: Non-Cooperative only
    3: Not defined

I062/080/EMS

- 3 bits [. . .]

- values:

0: No emergency
1: General emergency
2: Lifeguard / medical
3: Minimum fuel
4: No communications
5: Unlawful interference
6: Downed Aircraft
7: Undefined

I062/080/PFT

- 1 bit [.]
- values:

    0: No indication
    1: Potential False Track Indication

I062/080/FPLT

- 1 bit [.]
- values:

    0: Default value
    1: Track created / updated with FPL data

(FX)

- extension bit

    0: End of data item
    1: Extension into next extent

I062/080/DUPT

- 1 bit [.]
- values:

    0: Default value
    1: Duplicate Mode 3/A Code

I062/080/DUPF

- 1 bit [.]
- values:

    0: Default value
    1: Duplicate Flight Plan

I062/080/DUPM

- 1 bit [.]
- values:

    0: Default value
    1: Duplicate Flight Plan due to manual correlation

I062/080/SFC

- 1 bit [.]
- values:

    0: Default value
    1: Surface target

I062/080/IDD

- 1 bit [.]

- values:

    0: No indication
    1: Duplicate Flight-ID

I062/080/IEC

- 1 bit [.]
- values:

    0: Default value
    1: Inconsistent Emergency Code

I062/080/(spare)

- 1 bit [.]

(FX)

- extension bit

    0: End of data item
    1: Extension into next extent

Notes:

1. Track type and coasting can also be derived from I062/290 System Track Update Ages
2. If the system supports the technology, default value (0) means that the technology was used to produce the report
3. If the system does not support the technology, default value is meaningless.
4. Bits (EMS): other than subfield #11 of data item I062/380, these bits allow the SDPS to set the emergency indication as derived from other sources than ADS-B (e.g. based on the Mode 3/A code).
5. Bit 3 (PFT): with this flag an SDPS can indicate that internal processing points to the track being potentially false. Details on the internal processing are system dependent. In order to improve security on targets provided by ADS-B numerous validation functions have been developed in the ADS-B ground domain. If any of these validation functions show a potentially spoofed target, the PFT bit will be used to convey this information to the CWP. If and how this information is processed and displayed on the CWP is a local matter and not subject to the category 062 specification.
6. Bit (FPLT): this bit - if set - indicates that the information contained in the target report has been updated by flight plan related data because no surveillance data was available for the target, or was created based on flight plan related data in areas with no surveillance.
7. Bit (DUPT) is set to 1 if the correlation between the target report and a flight plan is not possible because the Mode 3/A code stated in the flight plan exists more than once in the surveillance data.
8. Bit (DUPF) - if set to 1 - indicates that for a specific surveillance target more than one flight plan exists which makes correlation impossible.
9. Bit (DUPM) is set to 1 if a target was correlated manually but also a regular flight plan exists.
10. All tracks for which bits 8, 7 or 6 are set to 1 are marked on the CWP.
11. Bit 5 (SFC) is set to 1 when the SDPS considers the target to be on the Surface (the actual meaning is implementation dependent – please refer to chapter 4.8 above).
12. Bit 4 (IDD) is set to 1 when the Flight ID is present more than once in the surveillance area.
13. Bit 3 (IEC) is set to 1 when the comparison between various sources has revealed an inconsistency in the information contained about emergency codes.
14. If I062/080 (MRH) indicates "Barometric altitude (Mode C) more reliable", and a calculated altitude is transmitted, it shall be transmitted using data item I062/135 "Calculated Track Barometric Altitude".

15. If I062/080 (MRH) indicates "Geometric altitude more reliable", and a calculated altitude is transmitted, it shall be transmitted using data item I062/130 "Calculated Track Geometric Altitude". In this case the source for I062/130 is indicated by I062/080 (SRC).
16. Data Items I062/130, I062/135, and I062/136 may be transmitted in parallel whenever the respective information is available. This is independent from the value transmitted on I062/080 (MRH).

I062/100 - Calculated Track Position (Cartesian)

Definition: Calculated position in Cartesian co-ordinates with a resolution of 0.5m, in two's complement form.

Structure:

    I062/100/X - *X Coordinate*

- 24 bits [. . . .]
- signed quantity
- unit: "m"
- LSB = $1/2$ m ≈ 0.50 m

    I062/100/Y - *Y Coordinate*

- 24 bits [. . . .]
- signed quantity
- unit: "m"
- LSB = $1/2$ m ≈ 0.50 m

I062/105 - Calculated Position In WGS-84 Co-ordinates

Definition: Calculated Position in WGS-84 Co-ordinates with a resolution of $180/2^{25}$ degrees.

Structure:

    I062/105/LAT - *Latitude*

- 32 bits [. . . .]
- signed quantity
- unit: "°"
- LSB = $180/2^25$ ° $\approx 5.36e-6$ °
- value $>= -90$ °
- value $<= 90$ °

    I062/105/LON - *Longitude*

- 32 bits [. . . .]
- signed quantity
- unit: "°"
- LSB = $180/2^25$ ° $\approx 5.36e-6$ °
- value $>= -180$ °
- value < 180 °

Notes:

- The LSB provides a resolution at least better than 0.6m.

I062/110 - Mode 5 Data Reports and Extended Mode 1 Code

Definition: Mode 5 Data reports and Extended Mode 1 Code.

Structure:

Compound item (FX)

I062/110/SUM - *Mode 5 Summary*

I062/110/SUM/M5
- 1 bit [.]
- values:
    - 0: No Mode 5 interrogation
    - 1: Mode 5 interrogation

I062/110/SUM/ID
- 1 bit [.]
- values:
    - 0: No authenticated Mode 5 ID reply
    - 1: Authenticated Mode 5 ID reply

I062/110/SUM/DA
- 1 bit [.]
- 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)

I062/110/SUM/M1
- 1 bit [.]
- values:
    - 0: Mode 1 code not present or not from Mode 5 reply
    - 1: Mode 1 code from Mode 5 reply

I062/110/SUM/M2
- 1 bit [.]
- values:
    - 0: Mode 2 code not present or not from Mode 5 reply
    - 1: Mode 2 code from Mode 5 reply

I062/110/SUM/M3
- 1 bit [.]
- values:
    - 0: Mode 3 code not present or not from Mode 5 reply
    - 1: Mode 3 code from Mode 5 reply

I062/110/SUM/MC
- 1 bit [.]
- values:
    - 0: Mode C altitude code not present or not from Mode 5 reply
    - 1: Mode C altitude from Mode 5 reply

I062/110/SUM/X - *X-pulse from Mode 5 Data Reply or Report*
- 1 bit [.]
- values:
    - 0: X-pulse set to zero or no authenticated Data reply or Report received
    - 1: X-pulse set to one

I062/110/PMN - *Mode 5 PIN/ National Origin/Mission Code*

I062/110/PMN/(spare)

- 2 bits [. .]

I062/110/PMN/PIN - *PIN Code*

- 14 bits [. . . . .]
- raw value

I062/110/PMN/(spare)

- 3 bits [. . .]

I062/110/PMN/NAT - *National Origin*

- 5 bits [. . . . .]
- raw value

I062/110/PMN/(spare)

- 2 bits [. .]

I062/110/PMN/MIS - *Mission Code*

- 6 bits [. . . . . .]
- raw value

I062/110/POS - *Mode 5 Reported Position*

I062/110/POS/LAT - *Latitude*

- 24 bits [. . . .]
- signed quantity
- unit: "°"
- LSB = $180/2^{23}$ ° $\approx 2.15e-5$ °
- value $>= -90$ °
- value $<= 90$ °

I062/110/POS/LON - *Longitude*

- 24 bits [. . . .]
- signed quantity
- unit: "°"
- LSB = $180/2^{23}$ ° $\approx 2.15e-5$ °
- value $>= -180$ °
- value < 180 °

I062/110/GA - *Mode 5 GNSS-derived Altitude*

I062/110/GA/(spare)

- 1 bit [.]

I062/110/GA/RES - *Resolution with which the GNSS-derived Altitude (GA) is Reported*

- 1 bit [.]
- values:

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

I062/110/GA/GA - *GNSS-derived Altitude of Target, Expressed as Height Above WGS 84 Ellipsoid*

- 14 bits [. . . . .]
- signed quantity
- unit: "ft"
- LSB = 25 ft
- value $>= -1000$ ft

I062/110/EM1 - *Extended Mode 1 Code in Octal Representation*

I062/110/EM1/(spare)

- 4 bits [. . . .]

I062/110/EM1/EM1 - *Extended Mode 1 Reply in Octal Representation*

- 12 bits [. . . . .]
- Octal string (3-bits per digit)

I062/110/TOS - *Time Offset for POS and GA*

Time Offset coded as a twos complement number with an LSB of 1/128 s. The time at which the Mode 5 Reported Position (Subfield #3) and Mode 5 GNSS-derived Altitude (Subfield #4) are valid is given by Time of Day (I048/140) plus Time Offset.

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

I062/110/XP - *X Pulse Presence*

I062/110/XP/(spare)

- 3 bits [. . .]

I062/110/XP/X5 - *X-pulse from Mode 5 Data Reply or Report*

- 1 bit [.]
- values:

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

I062/110/XP/XC - *X-pulse from Mode C Reply*

- 1 bit [.]
- values:

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

I062/110/XP/X3 - *X-pulse from Mode 3/A Reply*

- 1 bit [.]
- values:

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

I062/110/XP/X2 - *X-pulse from Mode 2 Reply*

- 1 bit [.]
- values:

    0: X-pulse set to zero or no Mode 2 reply
    1: X-pulse set to one (present)

I062/110/XP/X1 - *X-pulse from Mode 1 Reply*

- 1 bit [.]
- values:

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

Notes:

1. The flags M2, M3, MC refer to the contents of data subitems I062/120, I062/060 and I062/135 respectively. The flag M1 refers to the contents of the Subfield #5 (Extended Mode 1 Code in Octal Representation).
2. If an authenticated Mode 5 reply is received with the Emergency bit set, then the Military Emergency bit (ME) in Data Item I062/080, Track Status, shall be set.

3. If an authenticated Mode 5 reply is received with the Identification of Position bit set, then the Special Position Identification bit (SPI) in Data Item I062/080, Track Status, shall be set.
4. The resolution implied by the LSB is better than the resolution with which Mode 5 position reports are transmitted from aircraft transponders using currently defined formats.
5. GA is coded as a 14-bit two's complement binary number with an LSB of 25 ft. irrespective of the setting of RES.
6. The minimum value of GA that can be reported is -1000 ft.
7. If Subfield #1 is present, the M1 bit in Subfield #1 indicates whether the Extended Mode 1 Code is from a Mode 5 reply or a Mode 1 reply. If Subfield #1 is not present, the Extended Mode 1 Code is from a Mode 1 reply.
8. TOS shall be assumed to be zero if Subfield #6 is not present.

I062/120 - Track Mode 2 Code

Definition: Mode 2 code associated to the track

Structure:

I062/120/(spare)

- 4 bits [. . . .]

I062/120/MODE2 - *Mode-2 Code in Octal Representation*

- 12 bits [. . . . .]
- Octal string (3-bits per digit)

I062/130 - Calculated Track Geometric Altitude

Definition: Vertical distance between the target and the projection of its position on the earth's ellipsoid, as defined by WGS84, in two's complement form.

Structure:

- 16 bits [. . . . .]
- signed quantity
- unit: "ft"
- LSB = $25/2^2$ ft ≈ 6.25 ft
- value $>= -1500$ ft
- value $<= 150000$ ft

Notes:

1. LSB is required to be less than 10 ft by ICAO
2. The source of altitude is identified in bits (SRC) of item I062/080 Track Status.

I062/135 - Calculated Track Barometric Altitude

Definition: Calculated barometric altitude of the track, in two's complement form.

Structure:

I062/135/QNH

- 1 bit [.]
- values:

0: No QNH correction applied
1: QNH correction applied

I062/135/CTB - *Calculated Track Barometric Altitude*

- 15 bits [. . . . .]
- signed quantity
- unit: ”FL”
- LSB = $1/2^2$ FL $\approx$ 0.25 FL
- value $>= -15$ FL
- value $<= 1500$ FL

Notes:

1) ICAO specifies a range between -10 FL and 1267 FL for Mode C

I062/136 - Measured Flight Level

Definition: Last valid and credible flight level used to update the track, in two's complement form.

Structure:

- 16 bits [. . . . .]
- signed quantity
- unit: ”FL”
- LSB = $1/2^2$ FL $\approx$ 0.25 FL
- value $>= -15$ FL
- value $<= 1500$ FL

Notes:

1. The criteria to determine the credibility of the flight level are Tracker dependent.
2. Credible means: within reasonable range of change with respect to the previous detection.
3. ICAO specifies a range between -10 FL and 1267 FL for Mode C.
4. This item includes the barometric altitude received from ADS-B.

I062/185 - Calculated Track Velocity (Cartesian)

Definition: Calculated track velocity expressed in Cartesian co-ordinates,in two's complement form.

Structure:

I062/185/VX - *Velocity (X-component)*

- 16 bits [. . . . .]
- signed quantity
- unit: ”m/s”
- LSB = $1/2^2$ m/s $\approx$ 0.25 m/s
- value $>= -8192$ m/s
- value $<= 32767/4$ m/s

I062/185/VY - *Velocity (Y-component)*

- 16 bits [. . . . .]
- signed quantity
- unit: ”m/s”

- LSB = $1/2^2$ m/s $\approx$ 0.25 m/s
- value $>= -8192$ m/s
- value $<= 32767/4$ m/s

Notes:

- The y-axis points to the Geographical North at the location of the target.

I062/200 - Mode of Movement

Definition: Calculated Mode of Movement of a target.

Structure:

I062/200/TRANS - *Transversal Acceleration*

- 2 bits [..]
- values:

   0: Constant course
   1: Right turn
   2: Left turn
   3: Undetermined

I062/200/LONG - *Longitudinal Acceleration*

- 2 bits [..]
- values:

   0: Constant groundspeed
   1: Increasing groundspeed
   2: Decreasing groundspeed
   3: Undetermined

I062/200/VERT - *Transversal Acceleration*

- 2 bits [..]
- values:

   0: Level
   1: Climb
   2: Descent
   3: Undetermined

I062/200/ADF - *Altitude Discrepancy Flag*

- 1 bit [.]
- values:

   0: No altitude discrepancy
   1: Altitude discrepancy

I062/200/(spare)

- 1 bit [.]

Notes:

- The ADF, if set, indicates that a difference has been detected in the altitude information derived from radar as compared to other technologies (such as ADS-B).

I062/210 - Calculated Acceleration (Cartesian)

Definition: Calculated Acceleration of the target expressed in Cartesian co-ordinates, in two's complement form.

Structure:

I062/210/AX

- 8 bits [. . . . .]
- signed quantity
- unit: "m/s²"
- LSB = $1/2^2$ m/s² ≈ 0.25 m/s²

I062/210/AY

- 8 bits [. . . . .]
- signed quantity
- unit: "m/s²"
- LSB = $1/2^2$ m/s² ≈ 0.25 m/s²

Notes:

1. The y-axis points to the Geographical North at the location of the target.
2. Maximum value means maximum value or above.

I062/220 - Calculated Rate of Climb/Descent

Definition: Calculated rate of climb/descent of an aircraft in two's complement form.

Structure:

- 16 bits [. . . . .]
- signed quantity
- unit: "ft/min"
- LSB = $25/2^2$ ft/min ≈ 6.25 ft/min

Notes:

1. A positive value indicates a climb, whereas a negative value indicates a descent.

I062/245 - Target Identification

Definition: Target (aircraft or vehicle) identification in 8 characters.

Structure:

I062/245/STI

- 2 bits [. .]
- values:

    0: Callsign or registration downlinked from target
    1: Callsign not downlinked from target
    2: Registration not downlinked from target
    3: Invalid

I062/245/(spare)

- 6 bits [. . . . . .]

I062/245/CHR - *Characters 1-8 (Coded on 6 Bits Each) Defining Target Identification*

- 48 bits [... 48 bits ...]
- ICAO string (6-bits per character)

Notes:

1. For coding, see section 3.1.2.9 of [Ref.3]
2. As the Callsign of the target can already be transmitted (thanks to I062/380 Subfield #2 if downlinked from the aircraft or thanks to I062/390 Subfield #2 if the target is correlated to a flight plan), and in order to avoid confusion at end user's side, this item SHALL not be used.

I062/270 - Target Size and Orientation

Definition: Target size defined as length and width of the detected target, and orientation.

Structure:

Extended item.

I062/270/LENGTH - *Length*

- 7 bits [.......]
- unsigned quantity
- unit: "m"
- LSB = 1 m

(FX)

- extension bit
  - 0: End of data item
  - 1: Extension into next extent

I062/270/ORIENTATION - *Orientation*

- 7 bits [.......]
- unsigned quantity
- unit: "°"
- LSB = $360/2^7$ ° ≈ 2.81 °

(FX)

- extension bit
  - 0: End of data item
  - 1: Extension into next extent

I062/270/WIDTH - *Width*

- 7 bits [.......]
- unsigned quantity
- unit: "m"
- LSB = 1 m

(FX)

- extension bit
  - 0: End of data item
  - 1: Extension into next extent

Notes:

1. The orientation gives the direction which the target nose is pointing to,relative to the Geographical North.
2. When the length only is sent, the largest dimension is provided.

I062/290 - System Track Update Ages

Definition: Ages of the last plot/local track/target report update for each sensor type.

Structure:

Compound item (FX)

I062/290/TRK - *Track Age*

Actual track age since occurence

- 8 bits [. . . . .]
- unsigned quantity
- unit: "s"
- LSB = $1/2^2$ s ≈ 0.25 s
- value $<= 255/4$ s

I062/290/PSR - *PSR Age*

Age of the last primary detection used to update the track

- 8 bits [. . . . .]
- unsigned quantity
- unit: "s"
- LSB = $1/2^2$ s ≈ 0.25 s
- value $<= 255/4$ s

I062/290/SSR - *SSR Age*

Age of the last secondary detection used to update the track

- 8 bits [. . . . .]
- unsigned quantity
- unit: "s"
- LSB = $1/2^2$ s ≈ 0.25 s
- value $<= 255/4$ s

I062/290/MDS - *Mode S Age*

Age of the last Mode S detection used to update the track

- 8 bits [. . . . .]
- unsigned quantity
- unit: "s"
- LSB = $1/2^2$ s ≈ 0.25 s
- value $<= 255/4$ s

I062/290/ADS - *ADS-C Age*

Age of the last ADS-C report used to update the track

- 16 bits [. . . . .]
- unsigned quantity
- unit: "s"
- LSB = $1/2^2$ s ≈ 0.25 s
- value $<= 65535/4$ s

I062/290/ES - *ADS-B Extended Squitter Age*

Age of the last 1090 Extended Squitter ADS-B report used to update the track

- 8 bits [. . . . .]
- unsigned quantity
- unit: "s"
- LSB = $1/2^2$ s ≈ 0.25 s
- value $<= 255/4$ s

I062/290/VDL - *ADS-B VDL Mode 4 Age*

Age of the last VDL Mode 4 ADS-B report used to update the track

- 8 bits [. . . . .]
- unsigned quantity
- unit: "s"
- LSB = $1/2^2$ s ≈ 0.25 s
- value $<= 255/4$ s

I062/290/UAT - *ADS-B UAT Age*

Age of the last UAT ADS-B report used to update the track

- 8 bits [. . . . .]
- unsigned quantity
- unit: "s"
- LSB = $1/2^2$ s ≈ 0.25 s
- value $<= 255/4$ s

I062/290/LOP - *Loop Age*

Age of the last magnetic loop detection

- 8 bits [. . . . .]
- unsigned quantity
- unit: "s"
- LSB = $1/2^2$ s ≈ 0.25 s
- value $<= 255/4$ s

I062/290/MLT - *Multilateration Age*

Age of the last MLT detection

- 8 bits [. . . . .]
- unsigned quantity
- unit: "s"
- LSB = $1/2^2$ s ≈ 0.25 s
- value $<= 255/4$ s

Notes:

1. Except for Track Age, the ages are counted from Data Item I062/070, Time Of Track Information, using the following formula: Age = Time of track information - Time of last detection used to update the track
2. The time of last detection is derived from monosensor category time of day
3. If the data has never been received, then the corresponding subfield is not sent.
4. Maximum value means maximum value or above.

I062/295 - Track Data Ages

Definition: Ages of the data provided.

Structure:

Compound item (FX)

I062/295/MFL - *Measured Flight Level Age*

Age of the last valid and credible Mode C code or barometric altitude from ADS-B used to update the track (I062/136).

- 8 bits [. . . . .]
- unsigned quantity
- unit: "s"

- LSB = $1/2^2$ s ≈ 0.25 s
- value $<= 255/4$ s

I062/295/MD1 - *Mode 1 Age*

Age of the last valid and credible Mode 1 code used to update the track (I062/110).

- 8 bits [. . . . .]
- unsigned quantity
- unit: ″s″
- LSB = $1/2^2$ s ≈ 0.25 s
- value $<= 255/4$ s

I062/295/MD2 - *Mode 2 Age*

Age of the last valid and credible Mode 2 code used to update the track (I062/120).

- 8 bits [. . . . .]
- unsigned quantity
- unit: ″s″
- LSB = $1/2^2$ s ≈ 0.25 s
- value $<= 255/4$ s

I062/295/MDA - *Mode 3/A Age*

Age of the last valid and credible Mode 3/A code used to update the track (I062/060).

- 8 bits [. . . . .]
- unsigned quantity
- unit: ″s″
- LSB = $1/2^2$ s ≈ 0.25 s
- value $<= 255/4$ s

I062/295/MD4 - *Mode 4 Age*

Age of the last valid and credible Mode 4 code used to update the track.

- 8 bits [. . . . .]
- unsigned quantity
- unit: ″s″
- LSB = $1/2^2$ s ≈ 0.25 s
- value $<= 255/4$ s

I062/295/MD5 - *Mode 5 Age*

Age of the last valid and credible Mode 5 code used to update the track (I062/110).

- 8 bits [. . . . .]
- unsigned quantity
- unit: ″s″
- LSB = $1/2^2$ s ≈ 0.25 s
- value $<= 255/4$ s

I062/295/MHG - *Magnetic Heading Age*

Age of the DAP ″Magnetic Heading″ in item 062/380 (Subfield #3).

- 8 bits [. . . . .]
- unsigned quantity
- unit: ″s″
- LSB = $1/2^2$ s ≈ 0.25 s
- value $<= 255/4$ s

I062/295/IAS - *Indicated Airspeed / Mach Nb Age*

Age of the DAP ″Indicated Airspeed/Mach Number″ in item 062/380 (Subfield #4).

- 8 bits [. . . . .]

- unsigned quantity
- unit: "s"
- LSB = $1/2^2$ s ≈ 0.25 s
- value $<= 255/4$ s

I062/295/TAS - *True Airspeed Age*

Age of the DAP "True Airspeed" in item 062/380 (Subfield #5).

- 8 bits [........]
- unsigned quantity
- unit: "s"
- LSB = $1/2^2$ s ≈ 0.25 s
- value $<= 255/4$ s

I062/295/SAL - *Selected Altitude Age*

Age of the DAP "Selected Altitude" in item 062/380 (Subfield #6).

- 8 bits [........]
- unsigned quantity
- unit: "s"
- LSB = $1/2^2$ s ≈ 0.25 s
- value $<= 255/4$ s

I062/295/FSS - *Final State Selected Altitude Age*

Age of the DAP "Final State Selected Altitude Age" in item 062/380 (Subfield #7).

- 8 bits [........]
- unsigned quantity
- unit: "s"
- LSB = $1/2^2$ s ≈ 0.25 s
- value $<= 255/4$ s

I062/295/TID - *Trajectory Intent Age*

Age of the DAP "Trajectory Intent" in item 062/380 (Subfield #8).

- 8 bits [........]
- unsigned quantity
- unit: "s"
- LSB = $1/2^2$ s ≈ 0.25 s
- value $<= 255/4$ s

I062/295/COM - *Communication/ACAS Capability and Flight Status Age*

Age of the DAP "Communication/ACAS Capability and Flight Status" in item 062/380 (Subfield #10).

- 8 bits [........]
- unsigned quantity
- unit: "s"
- LSB = $1/2^2$ s ≈ 0.25 s
- value $<= 255/4$ s

I062/295/SAB - *Status Reported by ADS-B Age*

Age of the DAP "Status Reported by ADS-B" in item 062/380 (Subfield #11).

- 8 bits [........]
- unsigned quantity
- unit: "s"
- LSB = $1/2^2$ s ≈ 0.25 s
- value $<= 255/4$ s

I062/295/ACS - *ACAS Resolution Advisory Report Age*

Age of the DAP "ACAS Resolution Advisory Report" in item 062/380 (Subfield #12).

- 8 bits [. . . . .]
- unsigned quantity
- unit: "s"
- LSB = $1/2^2$ s ≈ 0.25 s
- value $<= 255/4$ s

I062/295/BVR - *Barometric Vertical Rate Age*

Age of the DAP "Barometric Vertical Rate" in item 062/380 (Subfield #13).

- 8 bits [. . . . .]
- unsigned quantity
- unit: "s"
- LSB = $1/2^2$ s ≈ 0.25 s
- value $<= 255/4$ s

I062/295/GVR - *Geometrical Vertical Rate Age*

Age of the DAP "Geometrical Vertical Rate" in item 062/380 (Subfield #14).

- 8 bits [. . . . .]
- unsigned quantity
- unit: "s"
- LSB = $1/2^2$ s ≈ 0.25 s
- value $<= 255/4$ s

I062/295/RAN - *Roll Angle Age*

Age of the DAP "Roll Angle" in item 062/380 (Subfield #15).

- 8 bits [. . . . .]
- unsigned quantity
- unit: "s"
- LSB = $1/2^2$ s ≈ 0.25 s
- value $<= 255/4$ s

I062/295/TAR - *Track Angle Rate Age*

Age of the DAP "Track Angle Rate" in item 062/380 (Subfield #16).

- 8 bits [. . . . .]
- unsigned quantity
- unit: "s"
- LSB = $1/2^2$ s ≈ 0.25 s
- value $<= 255/4$ s

I062/295/TAN - *Track Angle Age*

Age of the DAP "Track Angle" in item 062/380 (Subfield #17).

- 8 bits [. . . . .]
- unsigned quantity
- unit: "s"
- LSB = $1/2^2$ s ≈ 0.25 s
- value $<= 255/4$ s

I062/295/GSP - *Ground Speed Age*

Age of the DAP "Ground Speed" in item 062/380 (Subfield #18).

- 8 bits [. . . . .]
- unsigned quantity
- unit: "s"
- LSB = $1/2^2$ s ≈ 0.25 s

- value $<= 255/4$ s

I062/295/VUN - *Velocity Uncertainty Age*

Age of the DAP "Velocity Uncertainty" in item 062/380 (Subfield #19).

- 8 bits [. . . . .]
- unsigned quantity
- unit: "s"
- LSB = $1/2^2$ s ≈ 0.25 s
- value $<= 255/4$ s

I062/295/MET - *Meteorological Data Age*

Age of the DAP "Meteorological Data" in item 062/380 (Subfield #20).

- 8 bits [. . . . .]
- unsigned quantity
- unit: "s"
- LSB = $1/2^2$ s ≈ 0.25 s
- value $<= 255/4$ s

I062/295/EMC - *Emitter Category Age*

Age of the DAP "Emitter Category" in item 062/380 (Subfield #21).

- 8 bits [. . . . .]
- unsigned quantity
- unit: "s"
- LSB = $1/2^2$ s ≈ 0.25 s
- value $<= 255/4$ s

I062/295/POS - *Position Age*

Age of the DAP "Position" in item 062/380 (Subfield #23).

- 8 bits [. . . . .]
- unsigned quantity
- unit: "s"
- LSB = $1/2^2$ s ≈ 0.25 s
- value $<= 255/4$ s

I062/295/GAL - *Geometric Altitude Age*

Age of the DAP "Geometric Altitude" in item 062/380 (Subfield #24).

- 8 bits [. . . . .]
- unsigned quantity
- unit: "s"
- LSB = $1/2^2$ s ≈ 0.25 s
- value $<= 255/4$ s

I062/295/PUN - *Position Uncertainty Age*

Age of the DAP "Position Uncertainty" in item 062/380 (Subfield #25).

- 8 bits [. . . . .]
- unsigned quantity
- unit: "s"
- LSB = $1/2^2$ s ≈ 0.25 s
- value $<= 255/4$ s

I062/295/MB - *Mode S MB Data Age*

Age of the DAP "Mode S MB Data" in item 062/380 (Subfield #22).

- 8 bits [. . . . .]
- unsigned quantity

- unit: "s"
- LSB = $1/2^2$ s ≈ 0.25 s
- value $<= 255/4$ s

I062/295/IAR - *Indicated Airspeed Data Age*

Age of the DAP "Indicated Airspeed" in item 062/380 (Subfield #26).

- 8 bits [. . . . .]
- unsigned quantity
- unit: "s"
- LSB = $1/2^2$ s ≈ 0.25 s
- value $<= 255/4$ s

I062/295/MAC - *Mach Number Data Age*

Age of the DAP "Mach Number" in item 062/380 (Subfield #27).

- 8 bits [. . . . .]
- unsigned quantity
- unit: "s"
- LSB = $1/2^2$ s ≈ 0.25 s
- value $<= 255/4$ s

I062/295/BPS - *Barometric Pressure Setting Data Age*

Age of the DAP "Barometric Pressure Setting" in item 062/380 (Subfield #28).

- 8 bits [. . . . .]
- unsigned quantity
- unit: "s"
- LSB = $1/2^2$ s ≈ 0.25 s
- value $<= 255/4$ s

Notes:

1. Despite there are now two subfields (#29 and #30) reporting the ages of, respectively, the Indicated Airspeed track data and the Mach Number track data, the subfield #8 (and so its presence bit , bit-32) is kept free in order to prevent a full incompatibility with previous releases of ASTERIX Cat. 062 already implemented.
2. In all the subfields, the age is the time delay since the value was measured

I062/300 - Vehicle Fleet Identification

Definition: Vehicle fleet identification number.

Structure:

- 8 bits [. . . . .]

- values:

  0: Unknown
  1: ATC equipment maintenance
  2: Airport maintenance
  3: Fire
  4: Bird scarer
  5: Snow plough
  6: Runway sweeper
  7: Emergency
  8: Police
  9: Bus
  10: Tug (push/tow)

11: Grass cutter
12: Fuel
13: Baggage
14: Catering
15: Aircraft maintenance
16: Flyco (follow me)

I062/340 - Measured Information

Definition: All measured data related to the last report used to update the track. These data are not used for ADS-B.

Structure:

Compound item (FX)

I062/340/SID - *Sensor Identification*

I062/340/SID/SAC - *System Area Code*

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

I062/340/SID/SIC - *System Identification Code*

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

I062/340/POS - *Measured Position*

I062/340/POS/RHO - *Measured Distance*

- 16 bits [. . . . .]
- unsigned quantity
- unit: "NM"
- LSB = $1/2^8$ NM $\approx 3.91e - 3$ NM
- value $<= 256$ NM

I062/340/POS/THETA - *Measured Azimuth*

- 16 bits [. . . . .]
- unsigned quantity
- unit: "°"
- LSB = $360/2^16$ ° $\approx 5.49e - 3$ °

I062/340/HEIGHT - *Measured 3-D Height*

- 16 bits [. . . . .]
- signed quantity
- unit: "ft"
- LSB = 25 ft

> **remark** The reference level for this height information is the same as the reference level applied by the sensor system providing this information.

I062/340/MDC

I062/340/MDC/V - *Validated*

- 1 bit [.]
- values:
  - 0: Code validated
  - 1: Code not validated

I062/340/MDC/G - *Garbled*

- 1 bit [.]

- values:
    - 0: Default
    - 1: Garbled code

I062/340/MDC/LMC - *Last Measured Mode C Code*

Last Measured Mode C Code, in two's complement form

- 14 bits [. . . . .]
- signed quantity
- unit: "FL"
- LSB = $1/2^2$ FL $\approx$ 0.25 FL
- value $>= -12$ FL
- value $<= 1270$ FL

I062/340/MDA

I062/340/MDA/V - *Validated*

- 1 bit [.]
- values:
    - 0: Code validated
    - 1: Code not validated

I062/340/MDA/G - *Garbled*

- 1 bit [.]
- values:
    - 0: Default
    - 1: Garbled code

I062/340/MDA/L

- 1 bit [.]
- values:
    - 0: Mode 3/A code as derived from the reply of the transponder
    - 1: Mode 3/A code as provided by a sensor local tracker

I062/340/MDA/(spare)

- 1 bit [.]

I062/340/MDA/MODE3A - *Mode-3/A Reply in Octal Representation*

- 12 bits [. . . . .]
- Octal string (3-bits per digit)

I062/340/TYP

I062/340/TYP/TYP - *Report Type*

- 3 bits [. . .]
- 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

I062/340/TYP/SIM

- 1 bit [.]
- values:
    - 0: Actual target report
    - 1: Simulated target report

I062/340/TYP/RAB

- 1 bit [.]
- values:
    - 0: Report from target transponder
    - 1: Report from field monitor (item transponder)

I062/340/TYP/TST

- 1 bit [.]
- values:
    - 0: Real target report
    - 1: Test target report

I062/340/TYP/(spare)

- 2 bits [..]

Notes:

1. In case of a plot, the measured bias-corrected polar co-ordinates;
2. In case of a sensor local track, the measured bias-corrected polar co-ordinates of the plot associated to the track;
3. In case of a local track without detection, the extrapolated bias-corrected polar co-ordinates.
4. Smoothed MODE 3/A data (L = 1) will be used in case of absence of MODE 3/A code information in the plot or in case of difference between plot and sensor local track MODE 3/A code information.

I062/380 - Aircraft Derived Data

Definition: Data derived directly by the aircraft.

Structure:

Compound item (FX)

I062/380/ADR - *Target Address*

- 24 bits [........................]
- raw value

I062/380/ID - *Target Identification*

Characters 1-8 (coded on 6 bits each) defining a target identification when flight plan is available or the registration marking when no flight plan is available. Coding rules are provided in [3] Section 3.1.2.9.1.2 and Table 3-9"

- 48 bits [... 48 bits ...]
- ICAO string (6-bits per character)

I062/380/MHG - *Magnetic Heading*

- 16 bits [................]
- unsigned quantity
- unit: "°"
- LSB = $360/2^16$ ° $\approx 5.49e-3$ °

I062/380/IAS - *Indicated Airspeed/Mach No*

I062/380/IAS/IM

- 1 bit [.]
- values:
    - 0: Air Speed = IAS, LSB (Bit-1) = 2^-14 NM/s
    - 1: Air Speed = Mach, LSB (Bit-1) = 0.001

I062/380/IAS/IAS

- 15 bits [. . . . .]
- Depends on the value of `380/IAS/IM`.
- **In case of `380/IAS/IM == 0`:**
    - unsigned quantity
    - unit: "NM/s"
    - LSB = $1/2^14$ NM/s $\approx 6.10e - 5$ NM/s
- **In case of `380/IAS/IM == 1`:**
    - unsigned quantity
    - unit: "Mach"
    - LSB = $1/1000$ Mach $\approx 1.00e - 3$ Mach
- **Default:**
    - raw value

I062/380/TAS - *True Airspeed*

- 16 bits [. . . . .]
- unsigned quantity
- unit: "kt"
- LSB = 1 kt
- value $>= 0$ kt
- value $<= 2046$ kt

I062/380/SAL - *Selected Altitude*

I062/380/SAL/SAS

- 1 bit [.]
- values:

    0: No source information provided
    1: Source information provided

I062/380/SAL/SRC

- 2 bits [. .]
- values:

    0: Unknown
    1: Aircraft altitude
    2: FCU/MCP selected altitude
    3: FMS selected altitude

I062/380/SAL/ALT - *Altitude in Two's Complement Form*

- 13 bits [. . . . .]
- signed quantity
- unit: "ft"
- LSB = 25 ft
- value $>= -1300$ ft
- value $<= 100000$ ft

I062/380/FSS - *Final State Selected Altitude*

I062/380/FSS/MV - *Manage Vertical Mode*
Manage Vertical Mode

- 1 bit [.]
- values:

    0: Not active
    1: Active

I062/380/FSS/AH - *Altitude Hold*
Altitude Hold

- 1 bit [.]

- values:
    - 0: Not active
    - 1: Active

I062/380/FSS/AM - *Approach Mode*

Approach Mode

- 1 bit [.]
- values:
    - 0: Not active
    - 1: Active

I062/380/FSS/ALT - *Altitude in Two's Complement Form*

- 13 bits [. . . . .]
- signed quantity
- unit: "ft"
- LSB = 25 ft
- value $>= -1300$ ft
- value $<= 100000$ ft

I062/380/TIS - *Trajectory Intent Status*

Extended item.

I062/380/TIS/NAV - *TID Available*

- 1 bit [.]
- values:
    - 0: Trajectory intent data is available for this aircraft
    - 1: Trajectory intent data is not available for this aircraft

I062/380/TIS/NVB - *TID Valid*

- 1 bit [.]
- values:
    - 0: Trajectory intent data is valid
    - 1: Trajectory intent data is not valid

I062/380/TIS/(spare)

- 5 bits [. . . . .]

(FX)

- extension bit
    - 0: End of data item
    - 1: Extension into next extent

I062/380/TID - *Trajectory Intent Data*

Repetitive item, repetition factor 8 bits.

I062/380/TID/TCA - *TCP Number Availability*

- 1 bit [.]
- values:
    - 0: TCP number available
    - 1: TCP number not available

I062/380/TID/NC - *TCP Compliance*

- 1 bit [.]
- values:
    - 0: TCP compliance
    - 1: TCP non-compliance

I062/380/TID/TCPN - *Trajectory Change Point Number*

Trajectory change point number

- 6 bits [. . . . . .]
- raw value

I062/380/TID/ALT - *Altitude in Two's Complement Form*

- 16 bits [. . . . .]
- signed quantity
- unit: "ft"
- LSB = 10 ft
- value $>= -1500$ ft
- value $<= 150000$ ft

I062/380/TID/LAT - *Latitude in WGS.84 in Two's Complement*

- 24 bits [. . . . .]
- signed quantity
- unit: "°"
- LSB = $180/2^{23}$ ° $\approx 2.15e - 5$ °
- value $>= -90$ °
- value $<= 90$ °

I062/380/TID/LON - *Longitude in WGS.84 in Two's Complement*

- 24 bits [. . . . .]
- signed quantity
- unit: "°"
- LSB = $180/2^{23}$ ° $\approx 2.15e - 5$ °
- value $>= -180$ °
- value < 180 °

I062/380/TID/PT - *Point Type*

- 4 bits [. . . .]
- values:
    - 0: Unknown
    - 1: Fly by waypoint (LT)
    - 2: Fly over waypoint (LT)
    - 3: Hold pattern (LT)
    - 4: Procedure hold (LT)
    - 5: Procedure turn (LT)
    - 6: RF leg (LT)
    - 7: Top of climb (VT)
    - 8: Top of descent (VT)
    - 9: Start of level (VT)
    - 10: Cross-over altitude (VT)
    - 11: Transition altitude (VT)

I062/380/TID/TD - *Turn Direction*

- 2 bits [. .]
- values:
    - 0: N/A
    - 1: Turn right
    - 2: Turn left
    - 3: No turn

I062/380/TID/TRA - *Turn Radius Availability*

Turn Radius Availability

- 1 bit [.]
- values:
    - 0: TTR not available
    - 1: TTR available

I062/380/TID/TOA - *TOV Available*

- 1 bit [.]
- values:

0: TOV available
1: TOV not available

I062/380/TID/TOV - *Time Over Point*

- 24 bits [. . . . .]
- unsigned quantity
- unit: ”s”
- LSB = 1 s

I062/380/TID/TTR - *TCP Turn Radius*

- 16 bits [. . . . .]
- unsigned quantity
- unit: ”NM”
- LSB = $1/100$ NM $\approx 1.00e - 2$ NM
- value $>= 0$ NM
- value $<= 13107/20$ NM

I062/380/COM - *Communications/ACAS Capability and Flight Status*

I062/380/COM/COM - *Communications Capability of the Transponder*

- 3 bits [. . .]
- 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

I062/380/COM/STAT - *Flight Status*

- 3 bits [. . .]
- 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 defined
    - 7: Unknown or not yet extracted

I062/380/COM/(spare)

- 2 bits [. .]

I062/380/COM/SSC - *Specific Service Capability*

- 1 bit [.]
- values:
    - 0: No
    - 1: Yes

I062/380/COM/ARC - *Altitude Reporting Capability*

- 1 bit [.]
- values:
    - 0: 100 ft resolution
    - 1: 25 ft resolution

I062/380/COM/AIC - *Aircraft Identification Capability*

- 1 bit [.]
- values:

> 0: No
> 1: Yes

I062/380/COM/B1A - *BDS 1,0 Bit 16*

- 1 bit [.]
- raw value

I062/380/COM/B1B - *BDS BDS 1,0 Bits 37/40*

- 4 bits [. . . .]
- raw value

I062/380/SAB - *Status Reported by ADS-B*

I062/380/SAB/AC - *ACAS Status*

- 2 bits [. .]
- values:
  > 0: Unknown
  > 1: ACAS not operational
  > 2: ACAS operational
  > 3: Invalid

I062/380/SAB/MN - *Multiple Navigational Aids Status*

- 2 bits [. .]
- values:
  > 0: Unknown
  > 1: Multiple navigational aids not operating
  > 2: Multiple navigational aids operating
  > 3: Invalid

I062/380/SAB/DC - *Differential Correction Status*

- 2 bits [. .]
- values:
  > 0: Unknown
  > 1: Differential correction
  > 2: No differential correction
  > 3: Invalid

I062/380/SAB/GBS - *Ground Bit Set*

- 1 bit [.]
- values:
  > 0: Transponder ground bit not set or unknown
  > 1: Transponder Ground Bit set

I062/380/SAB/(spare)

- 6 bits [. . . . . .]

I062/380/SAB/STAT - *Flight Status*

- 3 bits [. . .]
- values:
  > 0: No emergency
  > 1: General emergency
  > 2: Lifeguard / medical
  > 3: Minimum fuel
  > 4: No communications
  > 5: Unlawful interference
  > 6: Downed Aircraft
  > 7: Unknown

I062/380/ACS - *ACAS Resolution Advisory Report*

Currently active Resolution Advisory (RA), if any, generated by the ACAS associated with the transponder transmitting the report and threat identity data. (MB Data) 56-bit message conveying Mode S Comm B message data of BDS Register 3,0

- 56 bits `[... 56 bits ...]`
- BDS register 30

I062/380/BVR - *Barometric Vertical Rate*

Barometric Vertical Rate in two's complement form

- 16 bits `[...............]`
- signed quantity
- unit: "ft/min"
- LSB = $25/2^2$ ft/min ≈ 6.25 ft/min

I062/380/GVR - *Geometric Vertical Rate*

Geometric Vertical Rate in two's complement form

- 16 bits `[...............]`
- signed quantity
- unit: "ft/min"
- LSB = $25/2^2$ ft/min ≈ 6.25 ft/min

I062/380/RAN - *Roll Angle*

Roll Angle in two's complement form

- 16 bits `[...............]`
- signed quantity
- unit: "°"
- LSB = $1/100$ ° ≈ $1.00e - 2$ °
- value >= −180 °
- value <= 180 °

I062/380/TAR - *Track Angle Rate*

I062/380/TAR/TI - *Turn Indicator*

- 2 bits `[..]`
- values:
  - 0: Not available
  - 1: Left
  - 2: Right
  - 3: Straight

I062/380/TAR/(spare)

- 6 bits `[......]`

I062/380/TAR/ROT - *Rate of Turn in Two's Complement Form*

- 7 bits `[.......]`
- signed quantity
- unit: "°/s"
- LSB = $1/2^2$ °/s ≈ 0.25 °/s
- value >= −15 °/s
- value <= 15 °/s

I062/380/TAR/(spare)

- 1 bit `[.]`

I062/380/TAN - *Track Angle*

- 16 bits `[...............]`
- unsigned quantity
- unit: "°"
- LSB = $360/2^16$ ° ≈ $5.49e - 3$ °

I062/380/GS - *Ground Speed*

Ground Speed in Two's Complement Form Referenced to WGS84

- 16 bits [. . . . .]
- signed quantity
- unit: "NM/s"
- LSB = $1/2^14$ NM/s $\approx 6.10e - 5$ NM/s
- value $>= -2$ NM/s
- value < 2 NM/s

I062/380/VUN - *Velocity Uncertainty*

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

I062/380/MET - *Meteorological Data*

I062/380/MET/WS - *Wind Speed Valid Flag*

- 1 bit [.]
- values:

    0: Not valid Wind Speed
    1: Valid Wind Speed

I062/380/MET/WD - *Wind Direction Valid Flag*

- 1 bit [.]
- values:

    0: Not valid Wind Direction
    1: Valid Wind Direction

I062/380/MET/TMP - *Temperature Valid Flag*

- 1 bit [.]
- values:

    0: Not valid Temperature
    1: Valid Temperature

I062/380/MET/TRB - *Turbulence Valid Flag*

- 1 bit [.]
- values:

    0: Not valid Turbulence
    1: Valid Turbulence

I062/380/MET/(spare)

- 4 bits [. . . .]

I062/380/MET/WSD - *Wind Speed*

- 16 bits [. . . . .]
- unsigned quantity
- unit: "kt"
- LSB = 1 kt
- value $>= 0$ kt
- value $<= 300$ kt

I062/380/MET/WDD - *Wind Direction*

- 16 bits [. . . . .]
- unsigned quantity
- unit: "°"
- LSB = 1 °
- value $>= 1$ °
- value $<= 360$ °

I062/380/MET/TMPD - *Temperature in Degrees Celsius*

- 16 bits [. . . . .]
- signed quantity
- unit: "°C"

- LSB = $1/2^2$ °C ≈ 0.25 °C
- value $>= -100$ °C
- value $<= 100$ °C

I062/380/MET/TRBD - *Turbulence*

- 8 bits [. . . . .]
- unsigned integer
- value $>= 0$
- value $<= 15$

I062/380/EMC - *Emitter Category*

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

  1: Light aircraft =< 7000 kg
  2: Reserved
  3: 7000 kg < medium aircraft < 136000 kg
  4: Reserved
  5: 136000 kg <= heavy aircraft
  6: Highly manoeuvrable (5g acceleration capability) and high speed (>400 knots cruise)
  7: Reserved
  8: Reserved
  9: Reserved
  10: Rotocraft
  11: Glider / sailplane
  12: Lighter-than-air
  13: Unmanned aerial vehicle
  14: Space / transatmospheric vehicle
  15: Ultralight / handglider / paraglider
  16: Parachutist / skydiver
  17: Reserved
  18: Reserved
  19: Reserved
  20: Surface emergency vehicle
  21: Surface service vehicle
  22: Fixed ground or tethered obstruction
  23: Reserved
  24: Reserved

I062/380/POS - *Position*

I062/380/POS/LAT - *Latitude in WGS.84 in Two's Complement Form*

- 24 bits [. . . .]
- signed quantity
- unit: ”°”
- LSB = $180/2^23$ ° $\approx 2.15e - 5$ °
- value $>= -90$ °
- value $<= 90$ °

I062/380/POS/LON - *Longitude in WGS.84 in Two's Complement Form*

- 24 bits [. . . .]
- signed quantity
- unit: ”°”
- LSB = $180/2^23$ ° $\approx 2.15e - 5$ °
- value $>= -180$ °
- value < 180 °

remark This corresponds to a resolution of at least 2.4 meters.

I062/380/GAL - *Geometric Altitude*

- 16 bits [. . . . .]
- signed quantity
- unit: "ft"
- LSB = $25/2^2$ ft $\approx$ 6.25 ft
- value $>= -1500$ ft
- value $<= 150000$ ft

I062/380/PUN - *Position Uncertainty*

I062/380/PUN/(spare)

- 4 bits [. . . .]

I062/380/PUN/PUN - *Position Uncertainty*

- 4 bits [. . . .]
- raw value

I062/380/MB - *MODE S MB DATA*

Repetitive item, repetition factor 8 bits.

- 64 bits [... 64 bits ...]
- BDS register with address

I062/380/IAR - *Indicated Airspeed*

- 16 bits [. . . . .]
- unsigned quantity
- unit: "kt"
- LSB = 1 kt
- value $>= 0$ kt
- value $<= 1100$ kt

I062/380/MAC - *Mach Number*

- 16 bits [. . . . .]
- unsigned quantity
- unit: "Mach"
- LSB = $1/125$ Mach $\approx 8.00e-3$ Mach
- value $>= 0$ Mach
- value $<= 512/125$ Mach

I062/380/BPS - *Barometric Pressure Setting*

I062/380/BPS/(spare)

- 4 bits [. . . .]

I062/380/BPS/BPS

- 12 bits [. . . . .]
- unsigned quantity
- unit: "mb"
- LSB = $1/10$ mb ≈ 0.10 mb
- value $>= 0$ mb
- value $<= 819/2$ mb

Notes:

1. NC is set to one when the aircraft will not fly the path described by the TCP data.
2. TCP numbers start from zero.
3. LT = Lateral Type
4. VT = Vertical Type
5. TOV gives the estimated time before reaching the point. It is defined as the absolute time from midnight.
6. TOV is meaningful only if TOA is set to 0

7. Refer to ICAO Draft SARPs for ACAS for detailed explanations.
8. A positive value represents a right turn, whereas a negative value represents a left turn.
9. Value 15 means 15 degrees/s or above.
10. Velocity uncertainty category of the least accurate velocity component
11. Positive longitude indicates East. Positive latitude indicates North.
12. LSB is required to be thinner than 10 ft by ICAO
13. Only DAPs that can not be encoded into other subfields of this item should be sent using subfield #25
14. BPS is the barometric pressure setting of the aircraft minus 800 mb.
15. As of Edition 1.19 the note "(derived from Mode S BDS 4,0)" has been removed to allow transmission of BPS received via ADS-B.

I062/390 - Flight Plan Related Data

Definition: All flight plan related information, provided by ground-based systems.

Structure:

Compound item (FX)

I062/390/TAG - *FPPS Identification Tag*

I062/390/TAG/SAC - *System Area Code*
- 8 bits [........]
- raw value

I062/390/TAG/SIC - *System Identification Code*
- 8 bits [........]
- raw value

I062/390/CS - *Callsign*

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

I062/390/IFI - *IFPS_FLIGHT_ID*

I062/390/IFI/TYP
- 2 bits [..]
- values:
    - 0: Plan Number
    - 1: Unit 1 internal flight number
    - 2: Unit 2 internal flight number
    - 3: Unit 3 internal flight number

I062/390/IFI/(spare)
- 3 bits [...]

I062/390/IFI/NBR - *Number from 0 to 99 999 999*
- 27 bits [...........................]
- unsigned integer
- value >= 0
- value <= 99999999

I062/390/FCT - *Flight Category*

I062/390/FCT/GATOAT
- 2 bits [..]
- values:

0: Unknown
1: General Air Traffic
2: Operational Air Traffic
3: Not applicable

I062/390/FCT/FR1FR2

- 2 bits [..]
- values:

  0: Instrument Flight Rules
  1: Visual Flight Rules
  2: Not applicable
  3: Controlled Visual Flight Rules

I062/390/FCT/RVSM

- 2 bits [..]
- values:

  0: Unknown
  1: Approved
  2: Exempt
  3: Not Approved

I062/390/FCT/HPR

- 1 bit [.]
- values:

  0: Normal Priority Flight
  1: High Priority Flight

I062/390/FCT/(spare)

- 1 bit [.]

I062/390/TAC - *Type of Aircraft*

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

I062/390/WTC - *Wake Turbulence Category*

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

I062/390/DEP - *Departure Airport*

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

I062/390/DST - *Destination Airport*

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

I062/390/RDS - *Runway Designation*

I062/390/RDS/NU1 - *First Number*

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

I062/390/RDS/NU2 - *Second Number*

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

I062/390/RDS/LTR - *Letter*

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

I062/390/CFL - *Current Cleared Flight Level*

- 16 bits [. . . . .]
- unsigned quantity
- unit: "FL"
- LSB = $1/2^2$ FL $\approx$ 0.25 FL
- value $<$ 1500 FL

I062/390/CTL - *Current Control Position*

I062/390/CTL/CENTRE - *8-bit Group Identification Code*

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

I062/390/CTL/POSITION - *8-bit Control Position Identification Code*

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

I062/390/TOD - *Time of Departure / Arrival*

Repetitive item, repetition factor 8 bits.

I062/390/TOD/TYP

- 5 bits [. . . . .]
- values:
    - 0: Scheduled off-block time
    - 1: Estimated off-block time
    - 2: Estimated take-off time
    - 3: Actual off-block time
    - 4: Predicted time at runway hold
    - 5: Actual time at runway hold
    - 6: Actual line-up time
    - 7: Actual take-off time
    - 8: Estimated time of arrival
    - 9: Predicted landing time
    - 10: Actual landing time
    - 11: Actual time off runway
    - 12: Predicted time to gate
    - 13: Actual on-block time

I062/390/TOD/DAY

- 2 bits [. .]
- values:
    - 0: Today
    - 1: Yesterday
    - 2: Tomorrow
    - 3: Invalid

I062/390/TOD/(spare)

- 4 bits [. . . .]

I062/390/TOD/HOR - *Hours*

- 5 bits [. . . . .]
- unsigned integer
- value $>= 0$
- value $<= 23$

I062/390/TOD/(spare)

- 2 bits [. .]

I062/390/TOD/MIN - *Minutes*

- 6 bits [. . . . . .]

- unsigned integer
- value $>= 0$
- value $<= 59$

I062/390/TOD/AVS - *Seconds Available Flag*

- 1 bit [.]
- values:
    - 0: Seconds available
    - 1: Seconds not available

I062/390/TOD/(spare)

- 1 bit [.]

I062/390/TOD/SEC - *Seconds*

- 6 bits [......]
- unsigned integer
- value $>= 0$
- value $<= 59$

I062/390/AST - *Aircraft Stand*

- 48 bits [... 48 bits ...]
- Ascii string (8-bits per character)

I062/390/STS - *Stand Status*

I062/390/STS/EMP

- 2 bits [..]
- values:
    - 0: Empty
    - 1: Occupied
    - 2: Unknown
    - 3: Invalid

I062/390/STS/AVL

- 2 bits [..]
- values:
    - 0: Available
    - 1: Not available
    - 2: Unknown
    - 3: Invalid

I062/390/STS/(spare)

- 4 bits [....]

I062/390/STD - *Standard Instrument Departure*

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

I062/390/STA - *Standard Instrument Arrival*

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

I062/390/PEM - *Pre-Emergency Mode 3/A*

I062/390/PEM/(spare)

- 3 bits [...]

I062/390/PEM/VA

- 1 bit [.]

- values:
    - 0: No valid Mode 3/A available
    - 1: Valid Mode 3/A available

I062/390/PEM/MODE3A - *Mode-3/A Reply in Octal Representation*

- 12 bits [. . . . .]
- Octal string (3-bits per digit)

I062/390/PEC - *Pre-Emergency Callsign*

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

Notes:

1. The up-to-date list of SACs is published on the Eurocontrol Web Site (http://www.eurocontrol.int).
2. Each one of the seven Octets contains an ASCII Character. TheCallsign is always left adjusted. It contains up to seven upper-case alphanumeric characters, the remaining character positions (if any)are padded with space characters.
3. Each one of the four Octets composing the type of an aircraft contains an ASCII Character (upper-case alphanumeric characters with trailing spaces).
4. The types of aircraft are defined in [Ref.4]
5. Each one of the four Octets composing the name of an airport contains an ASCII Character (upper case alphabetic).
6. The Airport Names are indicated in the ICAO Location Indicators book.
7. Each one of the four Octets composing the name of an airport contains an ASCII Character (upper case alphabetic).
8. The Airport Names are indicated in the ICAO Location Indicators book.
9. NU1, NU2 and LTR each contain an ASCII character
10. For details refer to.[5] Section 5
11. The centre and the control position identification codes have to be defined between communication partners.
12. Estimated times are derived from flight plan systems. Predicted times are derived by the fusion system, based on surveillance data. For definitions, see [Ref.4]
13. Each one of the six Octets contains an ASCII Character. The Aircraft Stand identification is always left adjusted. It contains up to six upper-case alphanumeric characters, the remaining character positions (if any) are padded with space characters.
14. Each one of the seven Octets contains an ASCII Character. The SID is always left adjusted. It contains up to seven alphanumeric characters, the remaining character positions (if any) are padded with space characters.
15. Each one of the seven Octets contains an ASCII Character. The STAR is always left adjusted. It contains up to seven alphanumeric characters, the remaining character positions (if any) are padded with space characters.
16. This subfield is used only when the aircraft is transmitting an emergency Mode 3/A code
17. If VA = 0, the content of bits 12/1 is meaningless
18. Each one of the seven Octets contains an ASCII Character. The Callsign is always left adjusted. It contains up to seven upper-case alphanumeric characters, the remaining character positions (if any) are padded with space characters
19. This subfield is used only when an emergency Mode 3/A is associated with the track (I062/390 Subfield #17)

I062/500 - Estimated Accuracies

Definition: Overview of all important accuracies.

Structure:

Compound item (FX)

I062/500/APC - *Estimated Accuracy Of Track Position (Cartesian)*

   I062/500/APC/X - *APC (X-Component)*

- 16 bits [. . . . .]
- unsigned quantity
- unit: ”m”
- LSB = 1/2 m ≈ 0.50 m

   I062/500/APC/Y - *APC (Y-Component)*

- 16 bits [. . . . .]
- unsigned quantity
- unit: ”m”
- LSB = 1/2 m ≈ 0.50 m

I062/500/COV - *XY Covariance Component*

- 16 bits [. . . . .]
- signed quantity
- unit: ”m”
- LSB = 1/2 m ≈ 0.50 m

I062/500/APW - *Estimated Accuracy Of Track Position (WGS-84)*

   I062/500/APW/LAT - *APW (Latitude Component)*

- 16 bits [. . . . .]
- unsigned quantity
- unit: ”°”
- LSB = $180/2^2 5$ ° ≈ $5.36e - 6$ °

   I062/500/APW/LON - *APW (Longitude Component)*

- 16 bits [. . . . .]
- unsigned quantity
- unit: ”°”
- LSB = $180/2^2 5$ ° ≈ $5.36e - 6$ °

I062/500/AGA - *Estimated Accuracy Of Calculated Track Geometric Altitude*

- 8 bits [. . . . .]
- unsigned quantity
- unit: ”ft”
- LSB = $25/2^2$ ft ≈ 6.25 ft

I062/500/ABA - *Estimated Accuracy Of Calculated Track Barometric Altitude*

- 8 bits [. . . . .]
- unsigned quantity
- unit: ”FL”
- LSB = $1/2^2$ FL ≈ 0.25 FL

I062/500/ATV - *Estimated Accuracy Of Track Velocity (Cartesian)*

   I062/500/ATV/X - *ATV (X-Component)*

- 8 bits [. . . . .]
- unsigned quantity
- unit: ”m/s”
- LSB = $1/2^2$ m/s ≈ 0.25 m/s

   I062/500/ATV/Y - *ATV (Y-Component)*

- 8 bits [. . . . .]
- unsigned quantity
- unit: ”m/s”
- LSB = $1/2^2$ m/s ≈ 0.25 m/s

I062/500/AA - *Estimated Accuracy Of Acceleration (Cartesian)*

   I062/500/AA/X - *AA (X-Component)*

- 8 bits [. . . . .]
- unsigned quantity
- unit: ″m/s²″
- LSB = $1/2^2$ m/s² ≈ 0.25 m/s²

   I062/500/AA/Y - *AA (Y-Component)*

- 8 bits [. . . . .]
- unsigned quantity
- unit: ″m/s²″
- LSB = $1/2^2$ m/s² ≈ 0.25 m/s²

I062/500/ARC - *Estimated Accuracy Of Rate Of Climb/Descent*

- 8 bits [. . . . .]
- unsigned quantity
- unit: ″ft/min″
- LSB = $25/2^2$ ft/min ≈ 6.25 ft/min

Notes:

1. Maximum value means maximum value or above.
2. XY covariance component = sign {Cov(X,Y)} * sqrt {abs [Cov (X,Y)]}
3. The maximum value for the (unsigned) XY covariance component is 16.383 km
4. Maximum value means maximum value or above.
5. Maximum value means maximum value or above.
6. Maximum value means maximum value or above.
7. Maximum value means maximum value or above.
8. Maximum value means maximum value or above.
9. Maximum value means maximum value or above.

I062/510 - Composed Track Number

Definition: Identification of a system track.

Structure:

Extended item.

   I062/510/MIDENT - *Master System Unit Identification*

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

   I062/510/MTRACK - *Master System Track Number*

- 15 bits [. . . . .]
- raw value

(FX)

- extension bit

     0: End of data item
     1: Extension into next extent

   I062/510/SIDENT - *Slave System Unit Identification*

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

I062/510/STRACK - *Slave System Track Number*

- 15 bits [. . . . .]
- raw value

(FX)

- extension bit
    - 0: End of data item
    - 1: Extension into next extent

Notes:

- The composed track number is used by co-operating units to uniquely identify a track. It consists of the unit identifier and system track number for each unit involved in the co-operation. The first unit identification identifies the unit that is responsible for the track amalgamation.

I062/RE - Reserved Expansion Field

Definition: Expansion

Structure:

Explicit item (RE)

I062/SP - Special Purpose Field

Definition: Special Purpose Field

Structure:

Explicit item (SP)

User Application Profile for Category 062

- (1) I062/010 - Data Source Identifier

- (2) (spare)

- (3) I062/015 - Service Identification

- (4) I062/070 - Time Of Track Information

- (5) I062/105 - Calculated Position In WGS-84 Co-ordinates

- (6) I062/100 - Calculated Track Position (Cartesian)

- (7) I062/185 - Calculated Track Velocity (Cartesian)

- (FX) - Field extension indicator

- (8) I062/210 - Calculated Acceleration (Cartesian)

- (9) I062/060 - Track Mode 3/A Code

- (10) I062/245 - Target Identification

- (11) I062/380 - Aircraft Derived Data

- (12) I062/040 - Track Number

- (13) I062/080 - Track Status

- (14) I062/290 - System Track Update Ages
- (FX) - Field extension indicator
- (15) I062/200 - Mode of Movement
- (16) I062/295 - Track Data Ages
- (17) I062/136 - Measured Flight Level
- (18) I062/130 - Calculated Track Geometric Altitude
- (19) I062/135 - Calculated Track Barometric Altitude
- (20) I062/220 - Calculated Rate of Climb/Descent
- (21) I062/390 - Flight Plan Related Data
- (FX) - Field extension indicator
- (22) I062/270 - Target Size and Orientation
- (23) I062/300 - Vehicle Fleet Identification
- (24) I062/110 - Mode 5 Data Reports and Extended Mode 1 Code
- (25) I062/120 - Track Mode 2 Code
- (26) I062/510 - Composed Track Number
- (27) I062/500 - Estimated Accuracies
- (28) I062/340 - Measured Information
- (FX) - Field extension indicator
- (29) (spare)
- (30) (spare)
- (31) (spare)
- (32) (spare)
- (33) (spare)
- (34) I062/RE - Reserved Expansion Field
- (35) I062/SP - Special Purpose Field
- (FX) - Field extension indicator