Asterix category 062 - SDPS Track Messages

category: 062

edition: 1.21

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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.

Group

I062/010/SAC - System Area Code

Element
bit size: 8
Raw Content

I062/010/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).

I062/015 - Service Identification

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

Element
bit size: 8
Raw Content

I062/040 - Track Number

definition: Identification of a track.

Element
bit size: 16
Raw Content

I062/060 - Track Mode 3/A Code

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

Group

I062/060/V - Validated

Element
bit size: 1
Values:

0: Code validated
1: Code not validated

I062/060/G - Garbled

Element
bit size: 1
Values:

0: Default
1: Garbled code

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

Element
bit size: 1
Values:

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

Spare bits: 1

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

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

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.

Element
bit size: 24
Unsigned quantity
LSB = $1/2^7$ s $\approx 7.8125e-3$ s
unit: ”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.

Extended

I062/080/MON

Element
bit size: 1
Values:

0: Multisensor track
1: Monosensor track

I062/080/SPI

Element
bit size: 1
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

Element
bit size: 1
Values:

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

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

Element
bit size: 3
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

Element
bit size: 1
Values:

0: Confirmed track
1: Tentative track

(FX) - extension bit

I062/080/SIM

Element
bit size: 1
Values:

0: Actual track
1: Simulated track

I062/080/TSE

Element
bit size: 1
Values:

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

I062/080/TSB

Element
bit size: 1
Values:

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

I062/080/FPC

Element
bit size: 1
Values:

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

I062/080/AFF

Element
bit size: 1
Values:

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

I062/080/STP

Element
bit size: 1
Values:

- **0:** Default value
- **1:** Slave Track Promotion

I062/080/KOS

Element
bit size: 1
Values:

- **0:** Complementary service used
- **1:** Background service used

(FX) - extension bit

I062/080/AMA

Element
bit size: 1
Values:

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

I062/080/MD4

Element
bit size: 2
Values:

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

I062/080/ME

Element
bit size: 1
Values:

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

I062/080/MI

Element
bit size: 1
Values:

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

I062/080/MD5

Element
bit size: 2
Values:

- **0:** No Mode 5 interrogation
- **1:** Friendly target

2: Unknown target
3: No reply

(FX) - extension bit

I062/080/CST

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

I062/080/PSR

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

I062/080/SSR

Element
bit size: 1
Values:
0: Default value
1: Age of the last received SSR track update is higher than system dependent threshold

I062/080/MDS

Element
bit size: 1
Values:
0: Default value
1: Age of the last received Mode S track update is higher than system dependent threshold

I062/080/ADS

Element
bit size: 1
Values:
0: Default value
1: Age of the last received ADS-B track update is higher than system dependent threshold

I062/080/SUC

Element
bit size: 1
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

Element
bit size: 1
Values:
0: Default value
1: Assigned Mode A Code Conflict (same discrete Mode A Code assigned to another track)

(FX) - extension bit

I062/080/SDS

Element
bit size: 2
Values:

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

I062/080/EMS

Element
bit size: 3
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

Element
bit size: 1
Values:

- **0:** No indication
- **1:** Potential False Track Indication

I062/080/FPLT

Element
bit size: 1
Values:

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

(FX) - extension bit

I062/080/DUPT

Element
bit size: 1
Values:

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

I062/080/DUPF

Element
bit size: 1
Values:

- **0:** Default value
- **1:** Duplicate Flight Plan

I062/080/DUPM

Element
bit size: 1
Values:

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

I062/080/SFC

Element
bit size: 1
Values:

0: Default value
1: Surface target

I062/080/IDD

Element
bit size: 1
Values:

0: No indication
1: Duplicate Flight-ID

I062/080/IEC

Element
bit size: 1
Values:

0: Default value
1: Inconsistent Emergency Code

I062/080/MLAT

Element
bit size: 1
Values:

0: Default value
1: Age of the last received MLAT track updateis higher than system dependent threshold

(FX) - extension bit

I062/080/M5I

Element
bit size: 1
Values:

0: Default value
1: Age of the last received Mode-5 interrogation track update is higher than system dependent threshold

Spare bits: 6

(FX) - extension bit

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. An extended coasting indication can be provided in I062/REF/STS/CSX.
5. If SUC=1, the SUC correlation text can be provided in I062/REF/MOI/SCT.
6. The SUC correlation text itself can be mapped from I032/REF/SCT to I062/REF/MOI/SCT in the target report.
7. Bits 6/4 (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).
8. Bits 6/4 (EMS): if EMS is populated from ADS-B information the following shall apply: In ADS-B Version 3 (as defined in I021/210/VN) some values of EMS have been redefined. In order to provide the information also in Data Item I062/080/EMS, mapping is required to ensure that information is not lost in systems not yet capable to decode this Edition of Category 062. If I021/210/VN = 3, the values contained in I062/REF/PS3 shall be mapped to I062/380/EMS in line with the following table: :

ADS-B Version 3 (I062/REF/PS3)	ADS-B Version < 3 (I062/080/EMS)
0 (No Emergency/not reported)	0 (No emergency/not reported)
1 (General emergency)	1 (General emergency)
2 (UAS/RPAS Lost Link)	4 (No communication)
3 (Minimum fuel)	3 (Minimum fuel)
4 (No communication)	4 (No communication)
5 (Unlawful interference)	5 (Unlawful interference)
6 (Aircraft in distress - automatic activation)	1 (General emergency)
7 (Aircraft in distress - manual activation)	1 (General emergency)

9. 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.
10. Bit 2 (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.
11. Bit 8 (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.
12. **Bit 7 (DUPF) - if set to 1 - indicates that for a specific surveillance target more** than one flight plan exists which makes correlation impossible.
13. **Bit 6 (DUPM) is set to 1 if a target was correlated manually but also a regular** flight plan exists.
14. All tracks for which bits 8, 7 or 6 are set to 1 are marked on the CWP.
15. 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).
16. Bit 4 (IDD) is set to 1 when the Flight ID is present more than once in the surveillance area.
17. Bit 3 (IEC) is set to 1 when the comparison between various sources has revealed an inconsistency in the information contained about emergency codes.
18. 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”.
19. 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).
20. 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).
21. Age of Mode 5 interrogation is provided in I062/REF/MOI/AM5I.

I062/100 - Calculated Track Position (Cartesian)

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

Group

I062/100/X - X Coordinate

Element
bit size: 24
Signed quantity
LSB = $1/2$ m ≈ 0.5 m
unit: ”m”

I062/100/Y - Y Coordinate

Element
bit size: 24
Signed quantity
LSB = $1/2$ m ≈ 0.5 m
unit: ”m”

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

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

Group

I062/105/LAT - Latitude

Element
bit size: 32
Signed quantity
LSB = $180/2^25$ ° ≈ $5.36441802978515625e-6$ °
unit: ”°”
>= -90.0
<= 90.0

I062/105/LON - Longitude

Element
bit size: 32
Signed quantity
LSB = $180/2^25$ ° ≈ $5.36441802978515625e-6$ °
unit: ”°”
>= -180.0
< 180.0

Note:

- 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.

Compound

I062/110/SUM - Mode 5 Summary

Group

I062/110/SUM/M5

Element
bit size: 1
Values:

0: No Mode 5 interrogation
1: Mode 5 interrogation

I062/110/SUM/ID

Element
bit size: 1
Values:

0: No authenticated Mode 5 ID reply

1: Authenticated Mode 5 ID reply

I062/110/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)

I062/110/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

I062/110/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

I062/110/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

I062/110/SUM/MC

Element
bit size: 1
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

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

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

Group

Spare bits: 2

I062/110/PMN/PIN - PIN Code

Element
bit size: 14
Raw Content

Spare bits: 3

I062/110/PMN/NAT - National Origin

Element
bit size: 5
Raw Content

Spare bits: 2

I062/110/PMN/MIS - Mission Code

Element
bit size: 6
Raw Content

I062/110/POS - Mode 5 Reported Position

Group

I062/110/POS/LAT - Latitude

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

I062/110/POS/LON - Longitude

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

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

Group

Spare bits: 1

I062/110/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

I062/110/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

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

Group

Spare bits: 4

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

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

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

description: 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.

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

I062/110/XP - X Pulse Presence

Group

Spare bits: 3

I062/110/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)

I062/110/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)

I062/110/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)

I062/110/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)

I062/110/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)

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

Group

Spare bits: 4

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

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

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.

Element
bit size: 16
Signed quantity
LSB = $25/2^2$ ft ≈ 6.25 ft
unit: ”ft”
>= -1500.0
<= 150000.0

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.

Group

I062/135/QNH

Element
bit size: 1
Values:

0: No QNH correction applied
1: QNH correction applied

I062/135/CTB - Calculated Track Barometric Altitude

Element
bit size: 15
Signed quantity
LSB = $1/2^2$ FL ≈ 0.25 FL
unit: ”FL”
>= -15.0
<= 1500.0

Notes:

- ICAO specifies a range between -10 FL and 1267 FL for Mode C.
- This item enables the provision of either QNH or non-QNH corrected Calculated Track Barometric Altitude, but not both. If needed, the other variant can be provided in I062/REF/MOI/CTBA.

I062/136 - Measured Flight Level

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

Element
bit size: 16
Signed quantity
LSB = $1/2^2$ FL ≈ 0.25 FL
unit: ”FL”
>= -15.0
<= 1500.0

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.
5. The altitude from QNH corrected measured Flight Level is provided in I062/REF/MOI/ALTQCMFL.

I062/185 - Calculated Track Velocity (Cartesian)

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

Group

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

Element
bit size: 16
Signed quantity
LSB = $1/2^2$ m/s ≈ 0.25 m/s
unit: ”m/s”
>= -8192.0
<= 8191.75

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

Element
bit size: 16
Signed quantity
LSB = $1/2^2$ m/s ≈ 0.25 m/s
unit: ”m/s”
>= -8192.0
<= 8191.75

Notes:

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

- For gate-to-gate tracking the velocity resolution of I062/185, Calculated Track Velocity (Cartesian), of 0.25 m/s is not sufficient for all applications addressing the ground segment especially for slow moving targets. Therefore a High Resolution Calculated Track Velocity can be provided in I062/REF/MOI/FPVHR.

I062/200 - Mode of Movement

definition: Calculated Mode of Movement of a target.

Group

I062/200/TRANS - Transversal Acceleration

Element
bit size: 2
Values:

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

I062/200/LONG - Longitudinal Acceleration

Element
bit size: 2
Values:

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

I062/200/VERT - Vertical Rate

Element
bit size: 2
Values:

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

I062/200/ADF - Altitude Discrepancy Flag

Element
bit size: 1
Values:

- **0:** No altitude discrepancy
- **1:** Altitude discrepancy

Spare bits: 1

Note:

- 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.

Group

I062/210/AX

Element
bit size: 8
Signed quantity
LSB = $1/2^2$ m/s² ≈ 0.25 m/s²
unit: ”m/s²”

I062/210/AY

Element
bit size: 8
Signed quantity
LSB = $1/2^2$ m/s² ≈ 0.25 m/s²
unit: ”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.

Element
bit size: 16
Signed quantity
LSB = $25/2^2$ ft/min ≈ 6.25 ft/min
unit: ”ft/min”

Note:

- 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.

Group

I062/245/STI

Element
bit size: 2
Values:

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

Spare bits: 6

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

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

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.

Extended

I062/270/LENGTH - Length

Element
bit size: 7
Unsigned quantity
LSB = 1 m ≈ 1.0 m
unit: ”m”

(FX) - extension bit

I062/270/ORIENTATION - Orientation

Element
bit size: 7
Unsigned quantity
LSB = $360/2^7$ ° ≈ 2.8125 °
unit: ”°”

(FX) - extension bit

I062/270/WIDTH - Width

Element
bit size: 7
Unsigned quantity
LSB = 1 m ≈ 1.0 m
unit: ”m”

(FX) - extension bit

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.

Compound

I062/290/TRK - Track Age

description: Actual track age since occurence

Element
bit size: 8
Unsigned quantity
LSB = $1/2^2$ s ≈ 0.25 s
unit: ”s”
<= 63.75

I062/290/PSR - PSR Age

description: Age of the last primary detection used to update the track

Element
bit size: 8
Unsigned quantity
LSB = $1/2^2$ s ≈ 0.25 s
unit: ”s”
<= 63.75

I062/290/SSR - SSR Age

description: Age of the last secondary detection used to update the track

Element
bit size: 8
Unsigned quantity
LSB = $1/2^2$ s ≈ 0.25 s
unit: ”s”
<= 63.75

I062/290/MDS - Mode S Age

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

Element
bit size: 8
Unsigned quantity
LSB = $1/2^2$ s ≈ 0.25 s
unit: ”s”
<= 63.75

I062/290/ADS - ADS-C Age

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

Element
bit size: 16
Unsigned quantity
LSB = $1/2^2$ s ≈ 0.25 s
unit: ”s”
<= 16383.75

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

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

Element
bit size: 8
Unsigned quantity
LSB = $1/2^2$ s ≈ 0.25 s
unit: ”s”
<= 63.75

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

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

Element
bit size: 8
Unsigned quantity
LSB = $1/2^2$ s ≈ 0.25 s
unit: ”s”
<= 63.75

I062/290/UAT - ADS-B UAT Age

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

Element
bit size: 8
Unsigned quantity
LSB = $1/2^2$ s ≈ 0.25 s
unit: ”s”
<= 63.75

I062/290/LOP - Loop Age

description: Age of the last magnetic loop detection

Element
bit size: 8
Unsigned quantity
LSB = $1/2^2$ s ≈ 0.25 s
unit: ”s”
<= 63.75

I062/290/MLT - Multilateration Age

description: Age of the last MLT detection

Element
bit size: 8
Unsigned quantity
LSB = $1/2^2$ s ≈ 0.25 s
unit: ”s”
<= 63.75

Notes:

1. Mode-5 radar interrogation age is provided in I062/REF/MOI/AM5I.
2. Mode-5 Level 2 Squitter age is provided in I062/REF/MOI/AM5L2S.
3. 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
4. The time of last detection is derived from monosensor category time of day
5. If the data has never been received, then the corresponding subfield is not sent.
6. Maximum value means maximum value or above.

I062/295 - Track Data Ages

definition: Ages of the data provided.

Compound

I062/295/MFL - Measured Flight Level Age

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

Element
bit size: 8
Unsigned quantity
LSB = $1/2^2$ s ≈ 0.25 s
unit: ”s”
<= 63.75

I062/295/MD1 - Mode 1 Age

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

Element
bit size: 8
Unsigned quantity
LSB = $1/2^2$ s ≈ 0.25 s
unit: ”s”
<= 63.75

I062/295/MD2 - Mode 2 Age

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

Element
bit size: 8
Unsigned quantity
LSB = $1/2^2$ s ≈ 0.25 s
unit: ”s”
<= 63.75

I062/295/MDA - Mode 3/A Age

description: Age of the last valid and credible Mode 3/A code used to update the track (I062/060 or I062/REF/MTI/EXM3A).

Element
bit size: 8
Unsigned quantity
LSB = $1/2^2$ s ≈ 0.25 s
unit: ”s”
<= 63.75

I062/295/MD4 - Mode 4 Age

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

Element
bit size: 8
Unsigned quantity
LSB = $1/2^2$ s ≈ 0.25 s
unit: ”s”
<= 63.75

I062/295/MD5 - Mode 5 Age

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

Element
bit size: 8
Unsigned quantity
LSB = $1/2^2$ s ≈ 0.25 s
unit: ”s”
<= 63.75

I062/295/MHG - Magnetic Heading Age

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

Element
bit size: 8
Unsigned quantity
LSB = $1/2^2$ s ≈ 0.25 s
unit: ”s”
<= 63.75

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

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

Element
bit size: 8
Unsigned quantity
LSB = $1/2^2$ s ≈ 0.25 s
unit: ”s”
<= 63.75

I062/295/TAS - True Airspeed Age

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

Element
bit size: 8
Unsigned quantity
LSB = $1/2^2$ s ≈ 0.25 s
unit: ”s”
<= 63.75

I062/295/SAL - Selected Altitude Age

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

Element
bit size: 8
Unsigned quantity
LSB = $1/2^2$ s ≈ 0.25 s
unit: ”s”
<= 63.75

I062/295/FSS - Final State Selected Altitude Age

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

Element
bit size: 8
Unsigned quantity
LSB = $1/2^2$ s ≈ 0.25 s
unit: ”s”
<= 63.75

I062/295/TID - Trajectory Intent Age

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

Element
bit size: 8
Unsigned quantity
LSB = $1/2^2$ s ≈ 0.25 s
unit: ”s”
<= 63.75

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

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

Element
bit size: 8
Unsigned quantity
LSB = $1/2^2$ s ≈ 0.25 s
unit: ”s”
<= 63.75

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

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

Element
bit size: 8
Unsigned quantity
LSB = $1/2^2$ s ≈ 0.25 s
unit: ”s”
<= 63.75

I062/295/ACS - ACAS Resolution Advisory Report Age

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

Element
bit size: 8
Unsigned quantity
LSB = $1/2^2$ s ≈ 0.25 s
unit: ”s”
<= 63.75

I062/295/BVR - Barometric Vertical Rate Age

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

Element
bit size: 8
Unsigned quantity
LSB = $1/2^2$ s ≈ 0.25 s
unit: ”s”
<= 63.75

I062/295/GVR - Geometrical Vertical Rate Age

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

Element
bit size: 8
Unsigned quantity
LSB = $1/2^2$ s ≈ 0.25 s
unit: ”s”
<= 63.75

I062/295/RAN - Roll Angle Age

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

Element
bit size: 8
Unsigned quantity
LSB = $1/2^2$ s ≈ 0.25 s
unit: ”s”
<= 63.75

I062/295/TAR - Track Angle Rate Age

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

Element
bit size: 8
Unsigned quantity
LSB = $1/2^2$ s ≈ 0.25 s
unit: ”s”
<= 63.75

I062/295/TAN - Track Angle Age

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

Element
bit size: 8
Unsigned quantity
LSB = $1/2^2$ s ≈ 0.25 s
unit: ”s”
<= 63.75

I062/295/GSP - Ground Speed Age

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

Element
bit size: 8
Unsigned quantity
LSB = $1/2^2$ s ≈ 0.25 s
unit: ”s”
<= 63.75

I062/295/VUN - Velocity Uncertainty Age

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

Element
bit size: 8
Unsigned quantity
LSB = $1/2^2$ s ≈ 0.25 s
unit: ”s”
<= 63.75

I062/295/MET - Meteorological Data Age

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

Element
bit size: 8
Unsigned quantity
LSB = $1/2^2$ s ≈ 0.25 s
unit: ”s”
<= 63.75

I062/295/EMC - Emitter Category Age

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

Element
bit size: 8
Unsigned quantity
LSB = $1/2^2$ s ≈ 0.25 s
unit: ”s”
<= 63.75

I062/295/POS - Position Age

description: Age of the DAP ”Position” in item 062/380 (Subfield #22).

Element
bit size: 8
Unsigned quantity
LSB = $1/2^2$ s ≈ 0.25 s
unit: ”s”
<= 63.75

I062/295/GAL - Geometric Altitude Age

description: Age of the DAP ”Geometric Altitude” in item 062/380 (Subfield #23).

Element
bit size: 8
Unsigned quantity
LSB = $1/2^2$ s ≈ 0.25 s
unit: ”s”
<= 63.75

I062/295/PUN - Position Uncertainty Age

description: Age of the DAP ”Position Uncertainty” in item 062/380 (Subfield #24).

Element
bit size: 8
Unsigned quantity
LSB = $1/2^2$ s ≈ 0.25 s
unit: ”s”
<= 63.75

I062/295/MB - BDS Register Data Age

description: Age of the DAP ”BDS Register Data” in item 062/380 (Subfield #25).

Element
bit size: 8
Unsigned quantity
LSB = $1/2^2$ s ≈ 0.25 s
unit: ”s”
<= 63.75

I062/295/IAR - Indicated Airspeed Data Age

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

Element
bit size: 8
Unsigned quantity
LSB = $1/2^2$ s ≈ 0.25 s
unit: ”s”
<= 63.75

I062/295/MAC - Mach Number Data Age

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

Element
bit size: 8
Unsigned quantity
LSB = $1/2^2$ s ≈ 0.25 s
unit: ”s”
<= 63.75

I062/295/BPS - Barometric Pressure Setting Data Age

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

Element
bit size: 8
Unsigned quantity
LSB = $1/2^2$ s ≈ 0.25 s
unit: ”s”
<= 63.75

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. A generalized version of this sub-item, which enables the provision of the ages of multiple BDS registers, is available in I062/REF/MOI/SI#10.
3. 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.

Element
bit size: 8
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.

Compound

I062/340/SID - Sensor Identification

Group

I062/340/SID/SAC - System Area Code

Element
bit size: 8
Raw Content

I062/340/SID/SIC - System Identification Code

Element
bit size: 8
Raw Content

I062/340/POS - Measured Position

Group

I062/340/POS/RHO - Measured Distance

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

I062/340/POS/THETA - Measured Azimuth

Element
bit size: 16
Unsigned quantity
LSB = $360/2^{1}6$ ° $\approx 5.4931640625e-3$ °
unit: ”°”

I062/340/HEIGHT - Measured 3-D Height

Element
bit size: 16

Signed quantity
LSB = 25 ft ≈ 25.0 ft
unit: ”ft”

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

Group

I062/340/MDC/V - Validated

Element
bit size: 1
Values:

0: Code validated
1: Code not validated

I062/340/MDC/G - Garbled

Element
bit size: 1
Values:

0: Default
1: Garbled code

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

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

Element
bit size: 14
Signed quantity
LSB = $1/2^2$ FL ≈ 0.25 FL
unit: ”FL”
>= -12.0
<= 1270.0

I062/340/MDA

Group

I062/340/MDA/V - Validated

Element
bit size: 1
Values:

0: Code validated
1: Code not validated

I062/340/MDA/G - Garbled

Element
bit size: 1
Values:

0: Default
1: Garbled code

I062/340/MDA/L

Element
bit size: 1
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

Spare bits: 1

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

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

I062/340/TYP

Group

I062/340/TYP/TYP - Report Type

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

I062/340/TYP/SIM

Element
bit size: 1
Values:

- **0:** Actual target report
- **1:** Simulated target report

I062/340/TYP/RAB

Element
bit size: 1
Values:

- **0:** Report from target transponder
- **1:** Report from field monitor (item transponder)

I062/340/TYP/TST

Element
bit size: 1
Values:

- **0:** Real target report
- **1:** Test target report

Spare bits: 2

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.

Compound

I062/380/ADR - Target Address

Element
bit size: 24
Raw Content

I062/380/ID - Target Identification

description: 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”

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

I062/380/MHG - Magnetic Heading

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

I062/380/IAS - Indicated Airspeed/Mach No

Group

I062/380/IAS/IM

Element
bit size: 1
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

Element
bit size: 15
Depending on: (`380/IAS/IM`)

(0): Unsigned quantity
LSB = $1/2^14$ NM/s ≈ $6.103515625e-5$ NM/s
unit: ”NM/s”

(1): Unsigned quantity
LSB = $1/1000$ Mach ≈ $1.0e-3$ Mach
unit: ”Mach”

Default:

Raw Content

I062/380/TAS - True Airspeed

Element
bit size: 16
Unsigned quantity
LSB = 1 kt ≈ 1.0 kt
unit: ”kt”
>= 0.0
<= 2046.0

I062/380/SAL - Selected Altitude

Group

I062/380/SAL/SAS

Element
bit size: 1
Values:

0: No source information provided
1: Source information provided

I062/380/SAL/SRC

Element
bit size: 2
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

Element
bit size: 13
Signed quantity
LSB = 25 ft ≈ 25.0 ft
unit: ”ft”
>= −1300.0
<= 100000.0

I062/380/FSS - Final State Selected Altitude

Group

I062/380/FSS/MV - Manage Vertical Mode

description: Manage Vertical Mode

Element
bit size: 1
Values:

0: Not active
1: Active

I062/380/FSS/AH - Altitude Hold

description: Altitude Hold

Element
bit size: 1
Values:

0: Not active
1: Active

I062/380/FSS/AM - Approach Mode

description: Approach Mode

Element
bit size: 1
Values:

0: Not active
1: Active

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

Element
bit size: 13
Signed quantity
LSB = 25 ft ≈ 25.0 ft
unit: ”ft”
>= −1300.0
<= 100000.0

I062/380/TIS - Trajectory Intent Status

Extended

I062/380/TIS/NAV - TID Available

Element
bit size: 1
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

Element
bit size: 1
Values:

0: Trajectory intent data is valid
1: Trajectory intent data is not valid

Spare bits: 5
(FX) - extension bit

I062/380/TID - Trajectory Intent Data

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

I062/380/TID/TCA - TCP Number Availability

Element
bit size: 1
Values:

0: TCP number available
1: TCP number not available

I062/380/TID/NC - TCP Compliance

Element
bit size: 1
Values:

0: TCP compliance
1: TCP non-compliance

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

description: Trajectory change point number

Element
bit size: 6
Raw Content

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

Element
bit size: 16
Signed quantity
LSB = 10 ft ≈ 10.0 ft
unit: ”ft”
>= -1500.0
<= 150000.0

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

Element
bit size: 24
Signed quantity
LSB = $180/2^{2}3$ ° ≈ $2.1457672119140625e-5$ °
unit: ”°”
>= -90.0
<= 90.0

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

Element
bit size: 24
Signed quantity
LSB = $180/2^{2}3$ ° ≈ $2.1457672119140625e-5$ °
unit: ”°”
>= -180.0
< 180.0

I062/380/TID/PT - Point Type

Element
bit size: 4
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

Element
bit size: 2
Values:

0: N/A
1: Turn right
2: Turn left
3: No turn

I062/380/TID/TRA - Turn Radius Availability

description: Turn Radius Availability

Element
bit size: 1
Values:

0: TTR not available
1: TTR available

I062/380/TID/TOA - TOV Available

Element
bit size: 1
Values:

0: TOV available
1: TOV not available

I062/380/TID/TOV - Time Over Point

Element
bit size: 24
Unsigned quantity
LSB = 1 s ≈ 1.0 s
unit: ”s”

I062/380/TID/TTR - TCP Turn Radius

Element
bit size: 16
Unsigned quantity
LSB = $1/100$ NM ≈ $1.0e-2$ NM
unit: ”NM”
>= 0.0
<= 655.35

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

Group

I062/380/COM/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

I062/380/COM/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 defined
7: Unknown or not yet extracted

Spare bits: 2

I062/380/COM/SSC - Specific Service Capability

Element
bit size: 1
Values:

0: No
1: Yes

I062/380/COM/ARC - Altitude Reporting Capability

Element
bit size: 1
Values:

0: 100 ft resolution
1: 25 ft resolution

I062/380/COM/AIC - Aircraft Identification Capability

Element
bit size: 1
Values:

0: No
1: Yes

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

Element
bit size: 1
Raw Content

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

Element
bit size: 4
Raw Content

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

Group

I062/380/SAB/AC - ACAS Status

Element
bit size: 2
Values:

0: Unknown

1: ACAS not operational
2: ACAS operational
3: Invalid

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

Element
bit size: 2
Values:

0: Unknown
1: Multiple navigational aids not operating
2: Multiple navigational aids operating
3: Invalid

I062/380/SAB/DC - Differential Correction Status

Element
bit size: 2
Values:

0: Unknown
1: Differential correction
2: No differential correction
3: Invalid

I062/380/SAB/GBS - Ground Bit Set

Element
bit size: 1
Values:

0: Transponder ground bit not set or unknown
1: Transponder Ground Bit set

Spare bits: 6

I062/380/SAB/STAT - Flight Status

Element
bit size: 3
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

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

Element
bit size: 56
BDS register at address 48

I062/380/BVR - Barometric Vertical Rate

description: Barometric Vertical Rate in two's complement form

Element
bit size: 16
Signed quantity
LSB = $25/2^2$ ft/min ≈ 6.25 ft/min
unit: ”ft/min”

I062/380/GVR - Geometric Vertical Rate

description: Geometric Vertical Rate in two's complement form

Element
bit size: 16
Signed quantity
LSB = $25/2^2$ ft/min ≈ 6.25 ft/min
unit: ”ft/min”

I062/380/RAN - Roll Angle

description: Roll Angle in two's complement form

Element
bit size: 16
Signed quantity
LSB = $1/100$ ° ≈ $1.0e-2$ °
unit: ”°”
>= -180.0
<= 180.0

I062/380/TAR - Track Angle Rate

Group

I062/380/TAR/TI - Turn Indicator

Element
bit size: 2
Values:

- **0:** Not available
- **1:** Left
- **2:** Right
- **3:** Straight

Spare bits: 6

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

Element
bit size: 7
Signed quantity
LSB = $1/2^2$ °/s ≈ 0.25 °/s
unit: ”°/s”
>= -15.0
<= 15.0

Spare bits: 1

I062/380/TAN - Track Angle

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

I062/380/GS - Ground Speed

description: Ground Speed in Two's Complement Form Referenced to WGS84

Element
bit size: 16
Signed quantity
LSB = $1/2^14$ NM/s ≈ $6.103515625e-5$ NM/s
unit: ”NM/s”
>= -2.0
< 2.0

I062/380/VUN - Velocity Uncertainty

Element
bit size: 8
Raw Content

I062/380/MET - Meteorological Data

Group

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

Element
bit size: 1
Values:

0: Not valid Wind Speed
1: Valid Wind Speed

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

Element
bit size: 1
Values:

0: Not valid Wind Direction
1: Valid Wind Direction

I062/380/MET/TMP - Temperature Valid Flag

Element
bit size: 1
Values:

0: Not valid Temperature
1: Valid Temperature

I062/380/MET/TRB - Turbulence Valid Flag

Element
bit size: 1
Values:

0: Not valid Turbulence
1: Valid Turbulence

Spare bits: 4

I062/380/MET/WSD - Wind Speed

Element
bit size: 16
Unsigned quantity
LSB = 1 kt ≈ 1.0 kt
unit: ”kt”
>= 0.0
<= 300.0

I062/380/MET/WDD - Wind Direction

Element
bit size: 16
Unsigned quantity
LSB = 1 ° ≈ 1.0 °
unit: ”°”
>= 1.0
<= 360.0

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

Element
bit size: 16
Signed quantity
LSB = $1/2^2$ °C ≈ 0.25 °C
unit: ”°C”
>= −100.0
<= 100.0

I062/380/MET/TRBD - Turbulence

Element
bit size: 8
Unsigned integer
>= 0.0
<= 15.0

I062/380/EMC - Emitter Category

Element
bit size: 8
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

Group

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

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

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

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

This corresponds to a resolution of at least 2.4 meters.

I062/380/GAL - Geometric Altitude

Element
bit size: 16
Signed quantity
LSB = $25/2^{2}$ ft ≈ 6.25 ft
unit: ”ft”
>= -1500.0
<= 150000.0

I062/380/PUN - Position Uncertainty

Group

Spare bits: 4

I062/380/PUN/PUN - Position Uncertainty

Element
bit size: 4
Raw Content

I062/380/BDSDATA - BDS Register DATA

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

Element
bit size: 64
BDS register with address

I062/380/IAR - Indicated Airspeed

Element
bit size: 16
Unsigned quantity
LSB = 1 kt ≈ 1.0 kt
unit: ”kt”
>= 0.0
<= 1100.0

I062/380/MAC - Mach Number

Element
bit size: 16
Unsigned quantity
LSB = $1/125$ Mach ≈ $8.0e-3$ Mach
unit: ”Mach”
>= 0.0
<= 4.096

I062/380/BPS - Barometric Pressure Setting

Group

Spare bits: 4

I062/380/BPS/BPS

Element
bit size: 12
Unsigned quantity
LSB = $1/10$ mb ≈ 0.1 mb
unit: ”mb”
>= 0.0
<= 409.5

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. To bits 3/1 (STAT): For ADS-B Version 3 systems as defined in ED-102B/DO-260C (Ref. [11]) the values have been re-defined.
8. I062/REF/PS3 is to be used exclusively for Version 3 ADS-B systems as defined in I062/380/SF#11/VN. For ADS-B systems with a version number below 3, the PS shall be encoded in Data Item I062/380 SF#11/STAT.

9. In case of an ADS-B Version 3 system as defined in ED-102B/DO-260C (Ref. [11]) in order to maintain backwards compatibility also I062/380/SF#11/STAT shall be populated. However, since values have been re-defined in ADS-B Version 3, mapping is required to ensure that information is not lost. This mapping shall be done according to the following table: :

ADS-B Version 3 (I062/REF/PS3)	ADS-Version < 3 (I062/380/SF#11/STAT)
0 (No Emergency/not reported)	0 (No Emergency/not reported)
1 (General emergency)	1 (General emergency)
2 (UAS/RPAS Lost Link)	4 (No communication)
3 (Minimum fuel)	3 (Minimum fuel)
4 (No communication)	4 (No communication)
5 (Unlawful interference)	5 (Unlawful interference)
6 (Aircraft in distress - automatic activation)	1 (General emergency)
7 (Aircraft in distress - manual activation)	1 (General emergency)

10. Refer to ICAO Draft SARPs for ACAS for detailed explanations.
11. A positive value represents a right turn, whereas a negative value represents a left turn.
12. Value 15 means 15 degrees/s or above.
13. Velocity uncertainty category of the least accurate velocity component
14. Positive longitude indicates East. Positive latitude indicates North.
15. LSB is required to be thinner than 10 ft by ICAO
16. Only DAPs that can not be encoded into other subfields of this item should be sent using subfield #25
17. BPS is the barometric pressure setting of the aircraft minus 800 mb.
18. 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.

Compound

I062/390/TAG - FPPS Identification Tag

Group

I062/390/TAG/SAC - System Area Code

Element
bit size: 8
Raw Content

I062/390/TAG/SIC - System Identification Code

Element
bit size: 8
Raw Content

I062/390/CS - Callsign

Element
bit size: 56
Ascii string (8-bits per char)

I062/390/IFI - IFPS_FLIGHT_ID

Group

I062/390/IFI/TYP

Element
bit size: 2
Values:

0: Plan Number
1: Unit 1 internal flight number
2: Unit 2 internal flight number
3: Unit 3 internal flight number

Spare bits: 3

I062/390/IFI/NBR - Number from 0 to 99 999 999

Element
bit size: 27
Unsigned integer
>= 0.0
<= $9.9999999e7$

I062/390/FCT - Flight Category

Group

I062/390/FCT/GATOAT

Element
bit size: 2
Values:

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

I062/390/FCT/FR1FR2

Element
bit size: 2
Values:

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

I062/390/FCT/RVSM

Element
bit size: 2
Values:

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

I062/390/FCT/HPR

Element
bit size: 1
Values:

0: Normal Priority Flight
1: High Priority Flight

Spare bits: 1

I062/390/TAC - Type of Aircraft

Element
bit size: 32
Ascii string (8-bits per char)

I062/390/WTC - Wake Turbulence Category

Element
bit size: 8
Ascii string (8-bits per char)

I062/390/DEP - Departure Airport

Element
bit size: 32
Ascii string (8-bits per char)

I062/390/DST - Destination Airport

Element
bit size: 32
Ascii string (8-bits per char)

I062/390/RDS - Runway Designation

Group

I062/390/RDS/NU1 - First Number

Element
bit size: 8
Ascii string (8-bits per char)

I062/390/RDS/NU2 - Second Number

Element
bit size: 8
Ascii string (8-bits per char)

I062/390/RDS/LTR - Letter

Element
bit size: 8
Ascii string (8-bits per char)

I062/390/CFL - Current Cleared Flight Level

Element
bit size: 16
Unsigned quantity
LSB = $1/2^2$ FL ≈ 0.25 FL
unit: "FL"
< 1500.0

I062/390/CTL - Current Control Position

Group

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

Element
bit size: 8
Raw Content

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

Element
bit size: 8
Raw Content

I062/390/TOD - Time of Departure / Arrival

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

I062/390/TOD/TYP

Element
bit size: 5
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

Element
bit size: 2
Values:

0: Today
1: Yesterday
2: Tomorrow
3: Invalid

Spare bits: 4

I062/390/TOD/HOR - Hours

Element
bit size: 5
Unsigned integer
>= 0.0
<= 23.0

Spare bits: 2

I062/390/TOD/MIN - Minutes

Element
bit size: 6
Unsigned integer
>= 0.0
<= 59.0

I062/390/TOD/AVS - Seconds Available Flag

Element
bit size: 1
Values:

0: Seconds available
1: Seconds not available

Spare bits: 1

I062/390/TOD/SEC - Seconds

Element
bit size: 6
Unsigned integer
>= 0.0
<= 59.0

I062/390/AST - Aircraft Stand

Element
bit size: 48
Ascii string (8-bits per char)

I062/390/STS - Stand Status

Group

I062/390/STS/EMP

Element
bit size: 2
Values:

0: Empty
1: Occupied
2: Unknown
3: Invalid

I062/390/STS/AVL

Element
bit size: 2
Values:

0: Available
1: Not available
2: Unknown
3: Invalid

Spare bits: 4

I062/390/STD - Standard Instrument Departure

Element
bit size: 56
Ascii string (8-bits per char)

I062/390/STA - Standard Instrument Arrival

Element
bit size: 56
Ascii string (8-bits per char)

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

Group

Spare bits: 3

I062/390/PEM/VA

Element
bit size: 1
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

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

I062/390/PEC - Pre-Emergency Callsign

Element
bit size: 56
Ascii string (8-bits per char)

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.

Compound

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

Group

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

Element
bit size: 16
Unsigned quantity
LSB = $1/2$ m ≈ 0.5 m
unit: ”m”

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

Element
bit size: 16
Unsigned quantity
LSB = $1/2$ m ≈ 0.5 m
unit: ”m”

I062/500/COV - XY Covariance Component

Element
bit size: 16
Signed quantity
LSB = $1/2$ m ≈ 0.5 m
unit: ”m”

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

Group

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

Element
bit size: 16
Unsigned quantity
LSB = $180/2^25$ ° $\approx 5.36441802978515625e-6$ °
unit: ”°”

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

Element
bit size: 16
Unsigned quantity
LSB = $180/2^25$ ° $\approx 5.36441802978515625e-6$ °
unit: ”°”

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

Element
bit size: 8
Unsigned quantity
LSB = $25/2^2$ ft ≈ 6.25 ft
unit: ”ft”

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

Element
bit size: 8
Unsigned quantity
LSB = $1/2^2$ FL ≈ 0.25 FL
unit: ”FL”

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

Group

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

Element
bit size: 8
Unsigned quantity
LSB = $1/2^2$ m/s ≈ 0.25 m/s
unit: ”m/s”

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

Element
bit size: 8
Unsigned quantity
LSB = $1/2^2$ m/s ≈ 0.25 m/s
unit: ”m/s”

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

Group

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

Element
bit size: 8
Unsigned quantity
LSB = $1/2^2$ m/s² ≈ 0.25 m/s²
unit: ”m/s²”

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

Element
bit size: 8
Unsigned quantity
LSB = $1/2^2$ m/s² ≈ 0.25 m/s²
unit: ”m/s²”

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

Element
bit size: 8
Unsigned quantity
LSB = $25/2^2$ ft/min ≈ 6.25 ft/min
unit: ”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.

Repetitive

With FX extension bit.

Group

I062/510/IDENT - System Unit Identification

Element
bit size: 8
Raw Content

I062/510/TRACK - System Track Number

Element
bit size: 15
Raw Content

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.
- The fist element represents Master track, the remaining elements represent Slave tracks.

I062/RE - Reserved Expansion Field

definition: Expansion

Explicit (ReservedExpansion)

I062/SP - Special Purpose Field

definition: Special Purpose Field

Explicit (SpecialPurpose)

User Application Profile

- 1: `I062/010` - Data Source Identifier
- *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
- *Spare*
- *Spare*
- *Spare*
- *Spare*
- *Spare*
- 34: `I062/RE` - Reserved Expansion Field
- 35: `I062/SP` - Special Purpose Field
- (FX) - Field extension indicator