

# Asterix category 062 - SDPS Track Messages

**category:** 062

**edition:** 1.16

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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

Spare bits: 2

#### 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  
 $LSB = 1/2^7 \text{ s} \approx 7.8125e - 3 \text{ s}$   
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

Spare bits: 4

*(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. 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 (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.
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 DUPT, DUPF or DUPM are set to 1 are marked on the CWP.

### **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  
 $LSB = 1/2 \text{ m} \approx 0.5 \text{ m}$   
 unit: "m"

#### **I062/100/Y - Y Coordinate**

Element  
 bit size: 24  
 Signed quantity  
 $LSB = 1/2 \text{ m} \approx 0.5 \text{ m}$   
 unit: "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.

Group

#### **I062/105/LAT - Latitude**

Element  
 bit size: 32  
 Signed quantity  
 $LSB = 180/2^{25} \approx 5.36441802978515625e - 6$  °  
 unit: "°"  
 $\geq -90.0$   
 $\leq 90.0$

#### **I062/105/LON - Longitude**

Element  
 bit size: 32  
 Signed quantity  
 $LSB = 180/2^{25} \approx 5.36441802978515625e - 6$  °  
 unit: "°"  
 $\geq -180.0$   
 $< 180.0$

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.

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  
 $LSB = 180/2^23 \approx 2.1457672119140625e - 5$  °  
unit: "°"  
 $\geq -90.0$   
 $\leq 90.0$

#### **I062/110/POS/LON - Longitude**

Element  
bit size: 24  
Signed quantity  
 $LSB = 180/2^23 \approx 2.1457672119140625e - 5$  °  
unit: "°"  
 $\geq -180.0$   
 $< 180.0$

### **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  $\approx$  25.0 ft  
unit: "ft"  
 $\geq -1000.0$

### **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 two's 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  $\approx$  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  
 $LSB = 25/2^2 \text{ ft} \approx 6.25 \text{ ft}$   
unit: "ft"  
 $\geq -1500.0$   
 $\leq 150000.0$

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"

$\geq -15.0$

$\leq 1500.0$

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.

Element

bit size: 16

Signed quantity

LSB =  $1/2^2$  FL ≈ 0.25 FL

unit: "FL"

$\geq -15.0$

$\leq 1500.0$

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.

## **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"

$\geq -8192.0$

$\leq 8191.75$

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

Element  
bit size: 16  
Signed quantity  
 $LSB = 1/2^2 \text{ m/s} \approx 0.25 \text{ m/s}$   
unit: "m/s"  
 $\geq -8192.0$   
 $\leq 8191.75$

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.

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

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.

Group

#### **I062/210/AX**

Element

bit size: 8

Signed quantity

LSB =  $1/2^2$  m/s<sup>2</sup> ≈ 0.25 m/s<sup>2</sup>

unit: "m/s<sup>2</sup>"

#### **I062/210/AY**

Element

bit size: 8

Signed quantity

LSB =  $1/2^2$  m/s<sup>2</sup> ≈ 0.25 m/s<sup>2</sup>

unit: "m/s<sup>2</sup>"

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"

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.

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 3.8.2.9 of [Ref.3]
2. As the Callsign of the target can already be transmitted (thanks to I062/380 Subfield #25 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  
 $LSB = 1 \text{ m} \approx 1.0 \text{ m}$   
unit: "m"

*(FX) - extension bit*

### **I062/270/ORIENTATION - Orientation**

Element  
bit size: 7  
Unsigned quantity  
 $LSB = 360/2^7 \text{ }^\circ \approx 2.8125 \text{ }^\circ$   
unit: "°"

*(FX) - extension bit*

### **I062/270/WIDTH - Width**

Element  
bit size: 7  
Unsigned quantity  
 $LSB = 1 \text{ m} \approx 1.0 \text{ m}$   
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 occurrence

Element  
bit size: 8  
Unsigned quantity  
 $LSB = 1/2^2 \text{ s} \approx 0.25 \text{ s}$   
unit: "s"  
 $\leq 63.75$

### **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. 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.

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).

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  
 $\text{LSB} = 1/2^2 \text{ s} \approx 0.25 \text{ s}$   
unit: "s"  
 $\leq 63.75$

#### **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).

Element  
bit size: 8  
Unsigned quantity  
 $\text{LSB} = 1/2^2 \text{ s} \approx 0.25 \text{ s}$   
unit: "s"  
 $\leq 63.75$

#### **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  
 $\text{LSB} = 1/2^2 \text{ s} \approx 0.25 \text{ s}$   
unit: "s"  
 $\leq 63.75$

#### **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  
 $\text{LSB} = 1/2^2 \text{ s} \approx 0.25 \text{ s}$   
unit: "s"  
 $\leq 63.75$

#### **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  
 $\text{LSB} = 1/2^2 \text{ s} \approx 0.25 \text{ s}$   
unit: "s"  
 $\leq 63.75$

#### **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  
 $\text{LSB} = 1/2^2 \text{ s} \approx 0.25 \text{ s}$   
unit: "s"  
 $\leq 63.75$

#### **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  
 $LSB = 1/2^2 \text{ s} \approx 0.25 \text{ s}$   
unit: "s"  
 $\leq 63.75$

#### **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  
 $LSB = 1/2^2 \text{ s} \approx 0.25 \text{ s}$   
unit: "s"  
 $\leq 63.75$

#### **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  
 $LSB = 1/2^2 \text{ s} \approx 0.25 \text{ s}$   
unit: "s"  
 $\leq 63.75$

#### **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  
 $LSB = 1/2^2 \text{ s} \approx 0.25 \text{ s}$   
unit: "s"  
 $\leq 63.75$

#### **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  
 $LSB = 1/2^2 \text{ s} \approx 0.25 \text{ s}$   
unit: "s"  
 $\leq 63.75$

#### **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  
 $LSB = 1/2^2 \text{ s} \approx 0.25 \text{ s}$   
unit: "s"  
 $\leq 63.75$

#### **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  
 $LSB = 1/2^2 \text{ s} \approx 0.25 \text{ s}$   
unit: "s"  
 $\leq 63.75$

#### **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  
 $LSB = 1/2^2 \text{ s} \approx 0.25 \text{ s}$   
unit: "s"  
 $\leq 63.75$

#### **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  
 $LSB = 1/2^2 \text{ s} \approx 0.25 \text{ s}$   
unit: "s"  
 $\leq 63.75$

#### **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  
 $LSB = 1/2^2 \text{ s} \approx 0.25 \text{ s}$   
unit: "s"  
 $\leq 63.75$

#### **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  
 $LSB = 1/2^2 \text{ s} \approx 0.25 \text{ s}$   
unit: "s"  
 $\leq 63.75$

#### **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  
 $LSB = 1/2^2 \text{ s} \approx 0.25 \text{ s}$   
unit: "s"  
 $\leq 63.75$

#### **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  
 $LSB = 1/2^2 \text{ s} \approx 0.25 \text{ s}$   
unit: "s"  
 $\leq 63.75$

#### **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  
 $LSB = 1/2^2 \text{ s} \approx 0.25 \text{ s}$   
unit: "s"  
 $\leq 63.75$

#### **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  
 $LSB = 1/2^2 \text{ s} \approx 0.25 \text{ s}$   
unit: "s"  
 $\leq 63.75$

#### **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  
 $LSB = 1/2^2 \text{ s} \approx 0.25 \text{ s}$   
unit: "s"  
 $\leq 63.75$

#### **I062/295/POS - Position Age**

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

Element  
bit size: 8  
Unsigned quantity  
 $LSB = 1/2^2 \text{ s} \approx 0.25 \text{ s}$   
unit: "s"  
 $\leq 63.75$

#### **I062/295/GAL - Geometric Altitude Age**

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

Element  
bit size: 8  
Unsigned quantity  
 $LSB = 1/2^2 \text{ s} \approx 0.25 \text{ s}$   
unit: "s"  
 $\leq 63.75$

#### **I062/295/PUN - Position Uncertainty Age**

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

Element  
bit size: 8  
Unsigned quantity  
 $\text{LSB} = 1/2^2 \text{ s} \approx 0.25 \text{ s}$   
unit: "s"  
 $\leq 63.75$

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

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

Element  
bit size: 8  
Unsigned quantity  
 $\text{LSB} = 1/2^2 \text{ s} \approx 0.25 \text{ s}$   
unit: "s"  
 $\leq 63.75$

### 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  
 $\text{LSB} = 1/2^2 \text{ s} \approx 0.25 \text{ s}$   
unit: "s"  
 $\leq 63.75$

### 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  
 $\text{LSB} = 1/2^2 \text{ s} \approx 0.25 \text{ s}$   
unit: "s"  
 $\leq 63.75$

### 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  
 $\text{LSB} = 1/2^2 \text{ s} \approx 0.25 \text{ s}$   
unit: "s"  
 $\leq 63.75$

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. 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"

$\leq 256.0$

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

Element

bit size: 16

Unsigned quantity

LSB =  $360/2^{16}$  °  $\approx 5.4931640625e - 3$  °

unit: "°"

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

Element

bit size: 16

Unsigned quantity

LSB = 25 ft  $\approx 25.0$  ft

unit: "ft"

## **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/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  $\approx 0.25$  FL

unit: "FL"

$\geq -12.0$

$\leq 1270.0$

## **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  
 $LSB = 360/2^{16} \text{ } \circ \approx 5.4931640625e - 3 \text{ } \circ$   
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  
 $LSB = 1/2^{14} \text{ NM/s} \approx 6.103515625e - 5 \text{ NM/s}$   
unit: "NM/s"

**(1):** Unsigned quantity  
 $LSB = 1/1000 \text{ Mach} \approx 1.0e - 3 \text{ Mach}$   
unit: "Mach"

Default:

Raw Content

### I062/380/TAS - True Airspeed

Element  
bit size: 16  
Unsigned quantity  
 $LSB = 1 \text{ kt} \approx 1.0 \text{ kt}$   
unit: "kt"  
 $\geq 0.0$   
 $\leq 2046.0$

### 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  $\approx$  10.0 ft  
unit: "ft"  
 $\geq -1500.0$   
 $\leq 150000.0$

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

Element  
bit size: 24  
Signed quantity  
LSB =  $180/2^{23} \text{ } ^\circ \approx 2.1457672119140625e - 5 \text{ } ^\circ$   
unit: " $^\circ$ "  
 $\geq -90.0$   
 $\leq 90.0$

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

Element  
bit size: 24  
Signed quantity  
LSB =  $180/2^{23} \text{ } ^\circ \approx 2.1457672119140625e - 5 \text{ } ^\circ$   
unit: " $^\circ$ "  
 $\geq -180.0$   
 $< 180.0$

##### 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

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. (MB Data) 56-bit message conveying Mode S Comm B message data of BDS Register 3,0

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  
 $\text{LSB} = 1/100^\circ \approx 1.0e - 2^\circ$   
unit: "°"  
 $\geq -180.0$   
 $\leq 180.0$

### 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  
 $\text{LSB} = 1/2^2^\circ/\text{s} \approx 0.25^\circ/\text{s}$   
unit: "°/s"  
 $\geq -15.0$   
 $\leq 15.0$

Spare bits: 1

### I062/380/TAN - Track Angle

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

### I062/380/GS - Ground Speed

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

Element  
bit size: 16  
Signed quantity  
 $\text{LSB} = 1/2^14 \text{ NM/s} \approx 6.103515625e - 5 \text{ NM/s}$   
unit: "NM/s"  
 $\geq -2.0$   
 $< 2.0$

### 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  $\approx$  1.0 kt  
unit: "kt"  
 $\geq 0.0$   
 $\leq 300.0$

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

Element  
bit size: 16  
Unsigned quantity  
LSB = 1 °  $\approx$  1.0 °  
unit: "°"  
 $\geq 1.0$   
 $\leq 360.0$

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

Element  
bit size: 16  
Signed quantity  
LSB = 1/2<sup>2</sup> °C  $\approx$  0.25 °C  
unit: "°C"  
 $\geq -100.0$   
 $\leq 100.0$

#### **I062/380/MET/TRBD - Turbulence**

Element  
bit size: 8  
Unsigned integer  
 $\geq 0.0$   
 $\leq 15.0$

#### **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  
 $LSB = 180/2^{23} \text{ } ^\circ \approx 2.1457672119140625e - 5 \text{ } ^\circ$   
 unit: "°"  
 $\geq -90.0$   
 $\leq 90.0$

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

Element  
 bit size: 24  
 Signed quantity  
 $LSB = 180/2^{23} \text{ } ^\circ \approx 2.1457672119140625e - 5 \text{ } ^\circ$   
 unit: "°"  
 $\geq -180.0$   
 $< 180.0$

This corresponds to a resolution of at least 2.4 meters.

### **I062/380/GAL - Geometric Altitude**

Element  
 bit size: 16  
 Signed quantity  
 $LSB = 25/2^2 \text{ ft } \approx 6.25 \text{ ft}$   
 unit: "ft"  
 $\geq -1500.0$   
 $\leq 150000.0$

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

Group

Spare bits: 4

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

Element  
bit size: 4  
Raw Content

#### **I062/380/MB - MODE S MB 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 (derived from Mode S BDS 4,0)**

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. 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.

## **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  
 $\geq 0.0$   
 $\leq 9.999999e7$

### **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  $\approx 0.25$  FL

unit: "FL"

## **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

$\geq 0.0$

$\leq 23.0$

Spare bits: 2

### **I062/390/TOD/MIN - Minutes**

Element

bit size: 6

Unsigned integer

$\geq 0.0$

$\leq 59.0$

### **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. 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.
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  
 $LSB = 1/2 \text{ m} \approx 0.5 \text{ m}$   
unit: "m"

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

Element  
bit size: 16  
Unsigned quantity  
 $LSB = 1/2 \text{ m} \approx 0.5 \text{ m}$   
unit: "m"

**I062/500/COV - XY Covariance Component**

Element  
bit size: 16  
Signed quantity  
 $LSB = 1/2 \text{ m} \approx 0.5 \text{ m}$   
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  
 $LSB = 180/2^5 {}^\circ \approx 5.36441802978515625e - 6 {}^\circ$   
unit: "°"

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

Element  
bit size: 16  
Unsigned quantity  
 $LSB = 180/2^5 {}^\circ \approx 5.36441802978515625e - 6 {}^\circ$   
unit: "°"

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

Element  
bit size: 8  
Unsigned quantity  
 $LSB = 25/2^2 \text{ ft} \approx 6.25 \text{ ft}$   
unit: "ft"

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

Element  
bit size: 8  
Unsigned quantity  
 $LSB = 1/2^2 \text{ FL} \approx 0.25 \text{ FL}$   
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  
 $LSB = 1/2^2 \text{ m/s} \approx 0.25 \text{ m/s}$   
unit: "m/s"

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

Element  
bit size: 8  
Unsigned quantity  
 $LSB = 1/2^2 \text{ m/s} \approx 0.25 \text{ m/s}$   
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  
 $LSB = 1/2^2 \text{ m/s}^2 \approx 0.25 \text{ m/s}^2$   
unit: "m/s<sup>2</sup>"

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

Element  
bit size: 8  
Unsigned quantity  
 $LSB = 1/2^2 \text{ m/s}^2 \approx 0.25 \text{ m/s}^2$   
unit: "m/s<sup>2</sup>"

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

Element  
bit size: 8  
Unsigned quantity  
 $LSB = 25/2^2 \text{ ft/min} \approx 6.25 \text{ ft/min}$   
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 first 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