



cat011 category specification

Release 2008-05-01, 1.2

Transmission of A-SMGCS Data

2008-05-01

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PREAMBLE

Surveillance data exchange.

DESCRIPTION OF STANDARD DATA ITEMS

2.1 I011/000 - Message Type

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

Structure:

- 8 bits [.]
- values:
 - 1: Target reports, flight plan data and basic alerts
 - 2: Manual attachment of flight plan to track
 - 3: Manual detachment of flight plan to track
 - 4: Insertion of flight plan data
 - 5: Suppression of flight plan data
 - 6: Modification of flight plan data
 - 7: Holdbar status

2.2 I011/010 - Data Source Identifier

Definition: Identification of the radar station from which the data are received.

Structure:

SAC - *System Area Code fixed to zero*

- 8 bits [.]
- raw value

SIC - *System Identification code*

- 8 bits [.]
- raw value

Note: The SAC is fixed to zero to indicate a data flow local to the airport.

2.3 I011/015 - Service Identification

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

Structure:

- 8 bits [.]
- raw value

Note: The service identification is allocated by the A-SMGCS

2.4 I011/041 - Position in WGS-84 Coordinates

Definition: Position of a target in WGS-84 Coordinates.

Structure:

Lat - *Latitude in WGS-84 in two's complement*

- 32 bits [.]
- signed quantity
- scaling factor: 180
- fractional bits: 31
- unit: "deg"
- $\text{LSB} = 180/2^{31} \text{ deg} = 180/2147483648 \text{ deg} \approx 8.381903171539307e-08 \text{ deg}$
- value $\geq -90 \text{ deg}$
- value $\leq 90 \text{ deg}$

Lon - *Longitude in WGS-84 in two's complement*

- 32 bits [.]
- signed quantity
- scaling factor: 180
- fractional bits: 31
- unit: "deg"
- $\text{LSB} = 180/2^{31} \text{ deg} = 180/2147483648 \text{ deg} \approx 8.381903171539307e-08 \text{ deg}$
- value $\geq -180 \text{ deg}$
- value $< 180 \text{ deg}$

2.5 I011/042 - Calculated Position in Cartesian Co-ordinates

Definition: Calculated position of a target in Cartesian co-ordinates (two's complement form).

Structure:

X - *X-Component*

- 16 bits [.]
- signed quantity

- scaling factor: 1
- fractional bits: 0
- unit: “m”
- $\text{LSB} = 1 \text{ m}$
- $\text{value} \geq -32768 \text{ m}$
- $\text{value} \leq 32768 \text{ m}$

Y - X-Component

- 16 bits [.....]
- signed quantity
- scaling factor: 1
- fractional bits: 0
- unit: “m”
- $\text{LSB} = 1 \text{ m}$
- $\text{value} \geq -32768 \text{ m}$
- $\text{value} \leq 32768 \text{ m}$

2.6 I011/060 - Mode-3/A Code in Octal Representation

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

Structure:

(spare)

- 4 bits [....]

Mod3A - Mode-3/A reply in octal representation

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

2.7 I011/090 - Measured Flight Level

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

Structure:

- 16 bits [.....]
- signed quantity
- scaling factor: 1
- fractional bits: 2
- unit: “FL”
- $\text{LSB} = 1/2^2 \text{ FL} = 1/4 \text{ FL} \approx 0.25 \text{ FL}$
- $\text{value} \geq -12 \text{ FL}$
- $\text{value} \leq 1500 \text{ FL}$

Note: The criteria to determine the credibility of the flight level are Tracker dependent.
Credible means: within reasonable range of change with respect to the previous detection.

2.8 I011/092 - Calculated Track Geometric Altitude

Definition: Calculated Track Geometric Altitude Calculated geometric vertical distance above mean sea level, not related to barometric pressure.

Structure:

- 16 bits [.....]
- signed quantity
- scaling factor: 25
- fractional bits: 2
- unit: "ft"
- $LSB = 25/2^2 \text{ ft} = 25/4 \text{ ft} \approx 6.25 \text{ ft}$
- value $\geq -1500 \text{ ft}$
- value $\leq 150000 \text{ ft}$

Note: The source of altitude is identified in bits (SRC) of item I011/170 Track Status.

2.9 I011/093 - Calculated Track Barometric Altitude

Definition: Calculated Barometric Altitude of the track.

Structure:

QNH - *QNH correction applied*

- 1 bit [.]
- values:
 - 0: No QNH correction applied
 - 1: QNH correction applied

CTBA - *Calculated Track Barometric Altitude*

- 15 bits [.....]
- signed quantity
- scaling factor: 1
- fractional bits: 2
- unit: "ft"
- $LSB = 1/2^2 \text{ ft} = 1/4 \text{ ft} \approx 0.25 \text{ ft}$
- value $\geq -15 \text{ ft}$
- value $\leq 1500 \text{ ft}$

2.10 I011/140 - Time of Track Information

Definition: Absolute time stamping expressed as UTC.

Structure:

- 24 bits [.....]
- unsigned quantity
- scaling factor: 1
- fractional bits: 7
- unit: "s"
- $\text{LSB} = 1/2^7 \text{ s} = 1/128 \text{ s} \approx 0.0078125 \text{ s}$

Note: The time of day value is reset to zero each day at midnight.

2.11 I011/161 - Track Number

Definition: Identification of a fusion track (single track number).

Structure:

(spare)

- 1 bit [.]

FTN - *Fusion Track Number*

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

2.12 I011/170 - Track Status

Definition: Status of track.

Structure:

Extended item with first part 8 bits long and optional 8 bits extends.

MON

- 1 bit [.]
- values:
 - 0: Multisensor Track
 - 1: Monosensor Track

GBS

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

MRH

- 1 bit [.]

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

SRC

- 3 bits [...]
- values:
 - 0: no source
 - 1: GPS
 - 2: 3d radar
 - 3: triangulation
 - 4: height from coverage
 - 5: speed look-up table
 - 6: default height
 - 7: multilateration

CNF

- 1 bit [.]
- values:
 - 0: Confirmed track
 - 1: Tentative track

(FX)

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

SIM

- 1 bit [.]
- values:
 - 0: Actual Track
 - 1: Simulated track

TSE

- 1 bit [.]
- values:
 - 0: default value
 - 1: track service end (i.e. last message transmitted to the user for the track).

TSB

- 1 bit [.]
- values:
 - 0: default value
 - 1: track service begin (i.e. first message transmitted to the user for the track)

FRIFOE

- 2 bits [...]
- values:

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

ME

- 1 bit [.]
- values:
 - 0: default value
 - 1: Military Emergency present in the last report received from a sensor capable of decoding this data

MI

- 1 bit [.]
- values:
 - 0: End of Data Item
 - 1: Military Identification present in the last report received from a sensor capable of decoding this data

(FX)

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

AMA

- 1 bit [.]
- values:
 - 0: track not resulting from amalgamation process
 - 1: track resulting from amalgamation process

SPI

- 1 bit [.]
- values:
 - 0: default value
 - 1: SPI present in the last report received from a sensor capable of decoding this data

CST

- 1 bit [.]
- values:
 - 0: default value
 - 1: Age of the last received track update is higher than system dependent threshold (coasting)

FPC

- 1 bit [.]
- values:
 - 0: Not flight-plan correlated
 - 1: Flight plan correlated

AFF

- 1 bit [.]
- values:
 - 0: default value
 - 1: ADS-B data inconsistent with other surveillance information

(spare)

- 2 bits [..]

(FX)

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

2.13 I011/202 - Calculated Track Velocity in Cartesian Coordinates

Definition: Calculated track velocity expressed in Cartesian co-ordinates.

Structure:

V_x - V_x

- 16 bits [.....]
- signed quantity
- scaling factor: 1
- fractional bits: 2
- unit: "m/s"
- $\text{LSB} = 1/2^2 \text{ m/s} = 1/4 \text{ m/s} \approx 0.25 \text{ m/s}$
- value $\geq -8192 \text{ m/s}$
- value $\leq 8192 \text{ m/s}$

V_y - V_y

- 16 bits [.....]
- signed quantity
- scaling factor: 1
- fractional bits: 2
- unit: "m/s"
- $\text{LSB} = 1/2^2 \text{ m/s} = 1/4 \text{ m/s} \approx 0.25 \text{ m/s}$
- value $\geq -8192 \text{ m/s}$
- value $\leq 8192 \text{ m/s}$

2.14 I011/210 - Calculated Acceleration

Definition: Calculated Acceleration of the target, in two's complement form.

Structure:

Ax - Ax

- 8 bits [.]
- signed quantity
- scaling factor: 1
- fractional bits: 2
- unit: "m/s²"
- $\text{LSB} = 1/2^2 \text{ m/s}^2 = 1/4 \text{ m/s}^2 \approx 0.25 \text{ m/s}^2$
- value $\geq -31 \text{ m/s}^2$
- value $\leq 31 \text{ m/s}^2$

Ay - Ay

- 8 bits [.]
- signed quantity
- scaling factor: 1
- fractional bits: 2
- unit: "m/s²"
- $\text{LSB} = 1/2^2 \text{ m/s}^2 = 1/4 \text{ m/s}^2 \approx 0.25 \text{ m/s}^2$
- value $\geq -31 \text{ m/s}^2$
- value $\leq 31 \text{ m/s}^2$

2.15 I011/215 - Calculated Rate Of Climb/Descent

Definition: Calculated rate of Climb/Descent of an aircraft, in two's complement form.

Structure:

- 16 bits [.]
- signed quantity
- scaling factor: 25
- fractional bits: 2
- unit: "ft/min"
- $\text{LSB} = 25/2^2 \text{ ft/min} = 25/4 \text{ ft/min} \approx 6.25 \text{ ft/min}$
- value $\geq -204800 \text{ ft/min}$
- value $\leq 204800 \text{ ft/min}$

2.16 I011/245 - Target Identification

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

Structure:

STI

- 2 bits [. .]
- values:
 - 0: Callsign or registration downlinked from transponde
 - 1: Callsign not downlinked from transponder
 - 2: Registration not downlinked from transponder

(spare)

- 6 bits [.]

TId - Target Identification

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

Note: Characters 1-8 (coded on 6 bits each) defining target identification

2.17 I011/270 - Target Size and Orientation

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

Structure:

Extended item with first part 8 bits long and optional 8 bits extends.

Length - Length

- 7 bits [.]
- unsigned quantity
- scaling factor: 1
- fractional bits: 0
- unit: "m"
- LSB = 1 m

(FX)

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

Ori - Orientation

- 7 bits [.]
- unsigned quantity
- scaling factor: 360
- fractional bits: 7
- unit: "deg"
- $\text{LSB} = 360/2^7 \text{ deg} = 360/128 \text{ deg} \approx 2.8125 \text{ deg}$

(FX)

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

Width - *Width*

- 7 bits [.]
- unsigned quantity
- scaling factor: 1
- fractional bits: 0
- unit: "m"
- LSB = 1 m

(FX)

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

Note: The orientation gives the direction which the aircraft nose is pointing, relative to the Geographical North.

2.18 I011/290 - System Track Update Ages

Definition: Ages of the last plot/local track, or the last valid mode-A/mode-C, used to update the system track.

Structure:

Compound item (FX)

PSR - *Age of the last primary detection used to update the track*

- 8 bits [.]
- unsigned quantity
- scaling factor: 1
- fractional bits: 2
- unit: "s"
- $\text{LSB} = 1/2^2 \text{ s} = 1/4 \text{ s} \approx 0.25 \text{ s}$

SSR - *Age of the last secondary detection used to update the track*

- 8 bits [.]
- unsigned quantity
- scaling factor: 1
- fractional bits: 2
- unit: "s"
- $\text{LSB} = 1/2^2 \text{ s} = 1/4 \text{ s} \approx 0.25 \text{ s}$

MDA - *Age of the last Mode A detection used to update the track*

- 8 bits [.]

- unsigned quantity
- scaling factor: 1
- fractional bits: 2
- unit: “s”
- $\text{LSB} = 1/2^2 \text{ s} = 1/4 \text{ s} \approx 0.25 \text{ s}$

MFL - *Age of the last Mode C detection used to update the track*

- 8 bits [.]
- unsigned quantity
- scaling factor: 1
- fractional bits: 2
- unit: “s”
- $\text{LSB} = 1/2^2 \text{ s} = 1/4 \text{ s} \approx 0.25 \text{ s}$

MDS - *Age of the last Mode S detection used to update the track*

- 8 bits [.]
- unsigned quantity
- scaling factor: 1
- fractional bits: 2
- unit: “s”
- $\text{LSB} = 1/2^2 \text{ s} = 1/4 \text{ s} \approx 0.25 \text{ s}$

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

- 16 bits [.]
- unsigned quantity
- scaling factor: 1
- fractional bits: 2
- unit: “s”
- $\text{LSB} = 1/2^2 \text{ s} = 1/4 \text{ s} \approx 0.25 \text{ s}$

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

- 8 bits [.]
- unsigned quantity
- scaling factor: 1
- fractional bits: 2
- unit: “s”
- $\text{LSB} = 1/2^2 \text{ s} = 1/4 \text{ s} \approx 0.25 \text{ s}$

MD1 - *Age of the last valid Mode 1 used to update the track*

- 8 bits [.]
- unsigned quantity
- scaling factor: 1
- fractional bits: 2
- unit: “s”

- $\text{LSB} = 1/2^2 \text{ s} = 1/4 \text{ s} \approx 0.25 \text{ s}$

MD2 - *Age of the last Mode 2 used to update the track*

- 8 bits [.]
- unsigned quantity
- scaling factor: 1
- fractional bits: 2
- unit: "s"
- $\text{LSB} = 1/2^2 \text{ s} = 1/4 \text{ s} \approx 0.25 \text{ s}$

LOP - *Age of the last magnetic loop detection*

- 8 bits [.]
- unsigned quantity
- scaling factor: 1
- fractional bits: 2
- unit: "s"
- $\text{LSB} = 1/2^2 \text{ s} = 1/4 \text{ s} \approx 0.25 \text{ s}$

TRK - *Actual track age since first occurrence*

- 8 bits [.]
- unsigned quantity
- scaling factor: 1
- fractional bits: 2
- unit: "s"
- $\text{LSB} = 1/2^2 \text{ s} = 1/4 \text{ s} \approx 0.25 \text{ s}$

MUL - *Age of the last multilateration detection*

- 8 bits [.]
- unsigned quantity
- scaling factor: 1
- fractional bits: 2
- unit: "s"
- $\text{LSB} = 1/2^2 \text{ s} = 1/4 \text{ s} \approx 0.25 \text{ s}$

Note: The ages are counted from Data Item I011/140, Time Of Track Information, using the following formula: Age = Time of track information - Time of last (valid) update
If the computed age is greater than the maximum value or if the data has never been received, then the corresponding subfield is not sent.

2.19 I011/300 - Vehicle Fleet Identification

Definition: Vehicle fleet identification number.

Structure:

- 8 bits [.]
- values:
 - 0: Flyco (follow me)
 - 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: Unknown

2.20 I011/310 - Pre-programmed Message

Definition: Number related to a pre-programmed message that can be transmitted by a vehicle.

Structure:

TRB - In trouble

- 1 bit [.]
- values:
 - 0: Default
 - 1: In Trouble

MSG - Message

- 7 bits [.]
- values:
 - 1: Towing aircraft
 - 2: "Follow me" operation
 - 3: Runway check
 - 4: Emergency operation (fire, medical...)
 - 5: Work in progress (maintenance, birds scarer, sweepers...)

2.21 I011/380 - Mode-S / ADS-B Related Data

Definition: Data specific to Mode-S ADS-B.

Structure:

Compound item (FX)

MB - *BDS*

Repetitive item, repetition factor 8 bits.

- 8 bits [.]
- BDS register

ADR - *24 bits Aircraft address*

- 24 bits [.]
- raw value

(empty subitem)

COMACAS - *Communications/ACAS Capability and Flight Status*

COM - *Communications capability of the transponder*

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

STAT - *Flight Status*

- 4 bits [. . . .]
- values:
 - 0: No alert, no SPI, aircraft airborne
 - 1: No alert, no SPI, aircraft on ground
 - 2: Alert, no SPI, aircraft airborne
 - 3: Alert, no SPI, aircraft on ground
 - 4: Alert, SPI, aircraft airborne or on ground
 - 5: No alert, SPI, aircraft airborne or on ground
 - 6: General Emergency
 - 7: Lifeguard / medical
 - 8: Minimum fuel
 - 9: No communications
 - 10: Unlawful

(spare)

- 1 bit [.]

SSC - *Specific service capability*

- 1 bit [.]

- values:
 - 0: No
 - 1: Yes

ARC - *Altitude reporting capability*

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

AIC - *Aircraft identification capability*

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

B1A - *BDS 1,0 bit 16*

- 1 bit [.]
- raw value

B1B - *BDS 1,0 bit 37/40*

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

AC - *ACAS operational*

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

MN - *Multiple navigational aids operating*

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

DC - *Differential correction*

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

(spare)

- 5 bits [.....]

(empty subitem)

(empty subitem)

(empty subitem)

ACT - *Aircraft Derived Aircraft Type*

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

ECAT - *Emitter category*

- 8 bits [.....]
- values:
 - 1: light aircraft <= 7000 kg
 - 2: reserved
 - 3: 7000 kg < medium aircraft < 136000 kg
 - 4: reserved
 - 5: 136000 kg <= heavy aircraft
 - 6: highly manoeuvrable (5g acceleration capability) and high speed (>400 knots cruise)
 - 7: reserved
 - 8: reserved
 - 9: reserved
 - 10: rotocraft
 - 11: glider / sailplane
 - 12: lighter-than-air
 - 13: unmanned aerial vehicle
 - 14: space / transatmospheric vehicle
 - 15: ultralight / handglider / paraglider
 - 16: parachutist / skydiver
 - 17: reserved
 - 18: reserved
 - 19: reserved
 - 20: surface emergency vehicle
 - 21: surface service vehicle
 - 22: fixed ground or tethered obstruction
 - 23: reserved
 - 24: reserved

(empty subitem)

AVTECH - *Available Technologies***VDL** - *VDL Mode 4*

- 1 bit [.]
- values:
 - 0: VDL Mode 4 available
 - 1: VDL Mode 4 not available

MDS - *Mode S*

- 1 bit [.]
- values:
 - 0: Mode S available
 - 1: Mode S not available

UAT - *UAT*

- 1 bit [.]
- values:

- 0: UAT available
- 1: UAT not available
- (spare)
 - 5 bits [.]
- (empty subitem)

2.22 I011/390 - Flight Plan Related Data

Definition: All flight plan related information.

Structure:

Compound item (FX)

FPPSId - *FPPS Identification Tag*

SAC - *System Area Code*

- 8 bits [.]
- raw value

SIC - *System Identity Code*

- 8 bits [.]
- raw value

CSN - *Callsign*

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

IFPS_FLIGHT_ID - *IFPS_FLIGHT_ID*

TYP - *IFPS Flight ID Type*

- 2 bits [. .]
- values:
 - 0: Plan number
 - 1: Unit 1 internal flight number
 - 2: Unit 2 internal flight number
 - 3: Unit 3 internal flight number

(spare)

- 3 bits [. . .]

NBR - *IFPS Flight ID Number*

- 27 bits [.]
- raw value

FLIGHTCAT - *Flight Category*

GAT_OAT - *Flight type*

- 2 bits [. .]
- values:
 - 0: Unknown
 - 1: General Air Traffic

2: Operational Air Traffic

3: Not applicable

FR1_FR2 - *Flight rules*

- 2 bits [. .]
- values:
 - 0: Instrument Flight Rules
 - 1: Visual Flight rules
 - 2: Not applicable
 - 3: Controlled Visual Flight Rules

RVSM - *RVSM*

- 2 bits [. .]
- values:
 - 0: Unknown Instrument Flight Rules
 - 1: Approved
 - 2: Exempt
 - 3: Not Approved

HPR - *Flight priority*

- 1 bit [.]
- values:
 - 0: Normal Priority Flight
 - 1: High Priority Flight

(spare)

- 1 bit [.]

TOA - *Type of Aircraft*

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

WTC - *Wake Turbulence Category*

- 8 bits [.]
- values:
 - 76: Light
 - 77: Medium
 - 72: Heavy
 - 74: Super

ADEP - *Departure Airport*

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

ADES - *Destination Airport*

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

RWY - *DRunway Designation*

- 24 bits [.]

- Ascii string (8-bits per character)

CFL - *Current Cleared Flight Level*

- 16 bits [.....]
- unsigned quantity
- scaling factor: 1
- fractional bits: 2
- unit: "FL"
- $LSB = 1/2^2 FL = 1/4 FL \approx 0.25 FL$

CCP - *Current Control Position*

Centre - *8-bit group Identification code*

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

Position - *8-bit Control Position identification code*

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

TOD - *Time of Departure*

Repetitive item, repetition factor 8 bits.

TYP - *Time Type*

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

DAY - *Day*

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

(spare)

- 4 bits [....]

HOR - *Hours, from 0 to 23*

- 5 bits [.]
- unsigned integer
- value ≥ 0
- value ≤ 23

(spare)

- 2 bits [. .]

MIN - *Minutes, from 0 to 59*

- 6 bits [.]
- unsigned integer
- value ≥ 0
- value ≤ 59

AVS - *Seconds available*

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

(spare)

- 1 bit [.]

SEC - *Seconds, from 0 to 59*

- 6 bits [.]
- unsigned integer
- value ≥ 0
- value ≤ 59

AST - *Aircraft Stand*

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

STS - *Stand Status***EMP** - *Stand empty*

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

AVL - *Stand available*

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

(spare)

- 4 bits [. . . .]

2.23 I011/430 - Phase of flight

Definition: Current phase of the flight.

Structure:

- 8 bits [.]
- values:
 - 0: unknown
 - 1: on stand
 - 2: taxiing for departure
 - 3: taxiing for arrival
 - 4: runway for departure
 - 5: runway for arrival
 - 6: hold for departure
 - 7: hold for arrival
 - 8: push back
 - 9: on finals

2.24 I011/500 - Estimated Accuracies

Definition: Overview of all important accuracies (standard deviations).

Structure:

Compound item (FX)

APC - *Estimated Accuracy Of Track Position (Cartesian)*

APC_X - *Estimated accuracy of the calculated position of X Component*

- 8 bits [.]
- unsigned quantity
- scaling factor: 1
- fractional bits: 2
- unit: "m"
- $\text{LSB} = 1/2^2 \text{ m} = 1/4 \text{ m} \approx 0.25 \text{ m}$

APC_Y - *Estimated accuracy of the calculated position of Y Component*

- 8 bits [.]
- unsigned quantity
- scaling factor: 1
- fractional bits: 2
- unit: "m"
- $\text{LSB} = 1/2^2 \text{ m} = 1/4 \text{ m} \approx 0.25 \text{ m}$

APW - *Estimated Accuracy Of Track Position (WGS84)*

APW_Lat - *APW Latitude Component Accuracy*

- 16 bits [.....]
- signed quantity
- scaling factor: 180
- fractional bits: 31
- unit: "deg"
- $\text{LSB} = 180/2^{31} \text{ deg} = 180/2147483648 \text{ deg} \approx 8.381903171539307e-08 \text{ deg}$

APW_Lon - *APW Longitude Component Accuracy*

- 16 bits [.....]
- signed quantity
- scaling factor: 180
- fractional bits: 31
- unit: "deg"
- $\text{LSB} = 180/2^{31} \text{ deg} = 180/2147483648 \text{ deg} \approx 8.381903171539307e-08 \text{ deg}$

ATH - *Estimated Accuracy Of Track Height*

- 16 bits [.....]
- signed quantity
- scaling factor: 0.5
- fractional bits: 0
- unit: "m"
- $\text{LSB} = 0.5 \text{ m}$

AVC - *Estimated Accuracy Of Track Velocity (Cartesian)***AVC_X** - *Estimated accuracy of the calculated velocity of X Component*

- 8 bits [.....]
- unsigned quantity
- scaling factor: 0.1
- fractional bits: 0
- unit: "m/s"
- $\text{LSB} = 0.1 \text{ m/s}$

AVC_Y - *Estimated accuracy of the calculated velocity of Y Component*

- 8 bits [.....]
- unsigned quantity
- scaling factor: 0.1
- fractional bits: 0
- unit: "m/s"
- $\text{LSB} = 0.1 \text{ m/s}$

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

- 16 bits [.....]
- signed quantity

- scaling factor: 0.1
- fractional bits: 0
- unit: "m/s"
- LSB = 0.1 m/s

AAC - *Estimated Accuracy Of Acceleration (Cartesian)*

AAC_X - *Estimated Accuracy Of Acceleration of X Component*

- 8 bits [.]
- unsigned quantity
- scaling factor: 0.01
- fractional bits: 0
- unit: "m/s²"
- LSB = 0.01 m/s²

AAC_Y - *Estimated Accuracy Of Acceleration of Y Component*

- 8 bits [.]
- unsigned quantity
- scaling factor: 0.01
- fractional bits: 0
- unit: "m/s²"
- LSB = 0.01 m/s²

2.25 I011/600 - Alert messages

Definition: Alert involving the targets indicated in I011/605.

Structure:

ACK - *Alert acknowledged*

- 1 bit [.]
- values:
 - 0: Alert acknowledged
 - 1: Alert not acknowledged

SVR - *Alert severity*

- 2 bits [. .]
- values:
 - 0: End fo alert
 - 1: Pre-alarm
 - 2: Severe alert

(spare)

- 5 bits [.]

AT - *Alert Type*

- 8 bits [.]

- raw value

AN - *Alert Number*

- 8 bits [.]
- raw value

2.26 I011/605 - Tracks in Alert

Definition: List of track numbers of the targets concerned by the alert described in I011/600.

Structure:

Repetitive item, repetition factor 8 bits.

(spare)

- 4 bits [. . . .]

FTN - *Fusion Track Number*

- 12 bits [.]
- raw value

2.27 I011/610 - Holdbar status

Definition: LStatus of up to sixteen banks of twelve indicators.

Structure:

Repetitive item, repetition factor 8 bits.

BKN - *Bank Number*

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

I1 - *Indicator 1*

- 1 bit [.]
- values:
 - 0: Indicator on
 - 1: Indicator off

I2 - *Indicator 2*

- 1 bit [.]
- values:
 - 0: Indicator on
 - 1: Indicator off

I3 - *Indicator 3*

- 1 bit [.]
- values:
 - 0: Indicator on
 - 1: Indicator off

I4 - Indicator 4

- 1 bit [.]
- values:
 - 0: Indicator on
 - 1: Indicator off

I5 - Indicator 5

- 1 bit [.]
- values:
 - 0: Indicator on
 - 1: Indicator off

I6 - Indicator 6

- 1 bit [.]
- values:
 - 0: Indicator on
 - 1: Indicator off

I7 - Indicator 7

- 1 bit [.]
- values:
 - 0: Indicator on
 - 1: Indicator off

I8 - Indicator 8

- 1 bit [.]
- values:
 - 0: Indicator on
 - 1: Indicator off

I9 - Indicator 9

- 1 bit [.]
- values:
 - 0: Indicator on
 - 1: Indicator off

I10 - Indicator 10

- 1 bit [.]
- values:
 - 0: Indicator on
 - 1: Indicator off

I11 - Indicator 11

- 1 bit [.]
- values:
 - 0: Indicator on
 - 1: Indicator off

I12 - Indicator 12

- 1 bit [.]
- values:
 - 0: Indicator on
 - 1: Indicator off

2.28 I011/SP - Special Purpose Field

Definition: Special Purpose Field

Structure:

Explicit item

2.29 I011/RE - Reserved Expansion Field

Definition: Expansion

Structure:

Explicit item

USER APPLICATION PROFILE FOR CATEGORY 011

- (1) I011/010 - Data Source Identifier
- (2) I011/000 - Message Type
- (3) I011/015 - Service Identification
- (4) I011/140 - Time of Track Information
- (5) I011/041 - Position in WGS-84 Coordinates
- (6) I011/042 - Calculated Position in Cartesian Co-ordinates
- (7) I011/202 - Calculated Track Velocity in Cartesian Coordinates
- (FX) - Field extension indicator
- (8) I011/210 - Calculated Acceleration
- (9) I011/060 - Mode-3/A Code in Octal Representation
- (10) I011/245 - Target Identification
- (11) I011/380 - Mode-S / ADS-B Related Data
- (12) I011/161 - Track Number
- (13) I011/170 - Track Status
- (14) I011/290 - System Track Update Ages
- (FX) - Field extension indicator
- (15) I011/430 - Phase of flight
- (16) I011/090 - Measured Flight Level
- (17) I011/093 - Calculated Track Barometric Altitude
- (18) I011/092 - Calculated Track Geometric Altitude
- (19) I011/215 - Calculated Rate Of Climb/Descent
- (20) I011/270 - Target Size and Orientation
- (21) I011/390 - Flight Plan Related Data
- (FX) - Field extension indicator
- (22) I011/300 - Vehicle Fleet Identification
- (23) I011/310 - Pre-programmed Message
- (24) I011/500 - Estimated Accuracies
- (25) I011/600 - Alert messages
- (26) I011/605 - Tracks in Alert
- (27) I011/610 - Holdbar status

- (28) I011/SP - Special Purpose Field
- (FX) - Field extension indicator
- (29) I011/RE - Reserved Expansion Field

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