cat011 category specification

Release 2020-05-11, 1.3

Transmission of A-SMGCS Data

2020-05-11

CONTENTS:

1 Preamble **3**

2 Description of standard data items **5**
2.1 I011/000 - Message Type . . . 5
2.2 I011/010 - Data Source Identifier . . . 5
2.3 I011/015 - Service Identification . . . 6
2.4 I011/041 - Position in WGS-84 Co-ordinates . . . 6
2.5 I011/042 - Calculated Position in Cartesian Co-ordinates . . . 6
2.6 I011/060 - Mode-3/A Code in Octal Representation . . . 7
2.7 I011/090 - Measured Flight Level . . . 7
2.8 I011/092 - Calculated Track Geometric Altitude . . . 8
2.9 I011/093 - Calculated Track Barometric Altitude . . . 8
2.10 I011/140 - Time of Track Information . . . 9
2.11 I011/161 - Track Number . . . 9
2.12 I011/170 - Track Status . . . 9
2.13 I011/202 - Calculated Track Velocity in Cartesian Coordinates . . . 13
2.14 I011/210 - Calculated Acceleration . . . 14
2.15 I011/215 - Calculated Rate Of Climb/Descent . . . 14
2.16 I011/245 - Target Identification . . . 15
2.17 I011/270 - Target Size and Orientation . . . 15
2.18 I011/290 - System Track Update Ages . . . 16
2.19 I011/300 - Vehicle Fleet Identification . . . 19
2.20 I011/310 - Pre-programmed Message . . . 19
2.21 I011/380 - Mode-S / ADS-B Related Data . . . 20
2.22 I011/390 - Flight Plan Related Data . . . 23
2.23 I011/430 - Phase of flight . . . 27
2.24 I011/500 - Estimated Accuracies . . . 27
2.25 I011/600 - Alert messages . . . 29
2.26 I011/605 - Tracks in Alert . . . 30
2.27 I011/610 - Holdbar status . . . 30
2.28 I011/SP - Special Purpose Field . . . 32
2.29 I011/RE - Reserved Expansion Field . . . 32

3 User Application Profile for Category 011 **33**

4 Indices and tables **35**

category: 011

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CHAPTER

ONE

PREAMBLE

Surveillance data exchange.

CHAPTER

TWO

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 is 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 Co-ordinates

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"
- LSB = $180/2^{31}$ deg = $180/2147483648$ deg $\approx 8.381903171539307e-08$ deg
- value $>= -90$ deg
- value $<= 90$ deg

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

- 32 bits [. . . . .]
- signed quantity
- scaling factor: 180
- fractional bits: 31
- unit: "deg"
- LSB = $180/2^{31}$ deg = $180/2147483648$ deg $\approx 8.381903171539307e-08$ deg
- value $>= -180$ deg
- value < 180 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”
- LSB = 1 m
- value >= -32768 m
- value <= 32768 m

Y - *X-Component*

- 16 bits [. . . . .]
- signed quantity
- scaling factor: 1
- fractional bits: 0
- unit: “m”
- LSB = 1 m
- value >= -32768 m
- value <= 32768 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”
- LSB = $1/2^2$ FL = $1/4$ FL ≈ 0.25 FL
- value >= -12 FL
- value <= 1500 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 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 = $25/2^2$ ft = $25/4$ ft ≈ 6.25 ft
- value $>= -1500$ ft
- value $<= 150000$ 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: "FL"
- LSB = $1/2^2$ FL = $1/4$ FL ≈ 0.25 FL
- value $>= -15$ FL
- value $<= 1500$ FL

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"
- LSB = $1/2^7$ s = $1/128$ s ≈ 0.0078125 s

Note: The Time of Track Information 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 interrogationt
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

(spare)

- 1 bit [.]

PSR

- 1 bit [.]
- values:

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

SSR

- 1 bit [.]
- values:

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

MDS

- 1 bit [.]
- values:

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

ADS

- 1 bit [.]
- values:

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

SUC

- 1 bit [.]
- values:

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

AAC

- 1 bit [.]
- values:

  0: default value
  1: Assigned Mode A Code Conflict (same individual Mode A Code assigned to another track)

(FX)

- extension bit

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

Track type and coasting can also be derived from Data Item I011/290 System Track Update Ages

2.13 I011/202 - Calculated Track Velocity in Cartesian Coordinates

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

Structure:

Vx - *Vx*

- 16 bits [. . . . .]
- signed quantity
- scaling factor: 1
- fractional bits: 2
- unit: “m/s”
- LSB = $1/2^2$ m/s = $1/4$ m/s ≈ 0.25 m/s
- value $>= -8192$ m/s
- value $<= 8192$ m/s

Vy - *Vy*

- 16 bits [. . . . .]
- signed quantity
- scaling factor: 1
- fractional bits: 2
- unit: “m/s”
- LSB = $1/2^2$ m/s = $1/4$ m/s ≈ 0.25 m/s
- value $>= -8192$ m/s
- value $<= 8192$ 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"
- LSB = $1/2^2$ m/s2 = $1/4$ m/s2 ≈ 0.25 m/s2
- value $>= -31$ m/s2
- value $<= 31$ m/s2

Ay - *Ay*

- 8 bits [. . . . .]
- signed quantity
- scaling factor: 1
- fractional bits: 2
- unit: "m/s2"
- LSB = $1/2^2$ m/s2 = $1/4$ m/s2 ≈ 0.25 m/s2
- value $>= -31$ m/s2
- value $<= 31$ m/s2

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"
- LSB = $25/2^2$ ft/min = $25/4$ ft/min ≈ 6.25 ft/min
- value $>= -204800$ ft/min
- value $<= 204800$ 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 transponder
  - 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”
- LSB = $360/2^7$ deg = $360/128$ deg ≈ 2.8125 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 to 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 report used to update the track*

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

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

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

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

- 8 bits [. . . . . .]

- unsigned quantity
- scaling factor: 1
- fractional bits: 2
- unit: “s”
- LSB = $1/2^2$ s = $1/4$ s ≈ 0.25 s

MFL - *Age of the last valid and credible Mode C used to update the track*

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

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

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

- LSB = $1/2^2$ s = $1/4$ s ≈ 0.25 s

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

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

LOP - *Age of the last magentic loop detection*

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

TRK - *Actual track age since first occurrence*

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

MUL - *Age of the last multilateration detection*

- 8 bits [. . . . .]
- unsigned quantity
- scaling factor: 1
- fractional bits: 2
- unit: “s”
- LSB = $1/2^2$ s = $1/4$ s ≈ 0.25 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 interference

`(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
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 - *Runway 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 ≈ 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”
- LSB = $1/2^2$ m = $1/4$ m ≈ 0.25 m

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

- 8 bits [. . . . . .]
- unsigned quantity
- scaling factor: 1
- fractional bits: 2
- unit: “m”
- LSB = $1/2^2$ m = $1/4$ m ≈ 0.25 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”
- LSB = $180/2^{31}$ deg = $180/2147483648$ deg $\approx 8.381903171539307e-08$ deg

APW_Lon - *APW Longitude Component Accuracy*

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

ATH - *Estimated Accuracy Of Height*

- 16 bits [. . . . .]
- signed quantity
- scaling factor: 0.5
- fractional bits: 0
- unit: “m”
- LSB = 0.5 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”
- LSB = 0.1 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”
- LSB = 0.1 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 acknowleged*

- 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: Status 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

CHAPTER

THREE

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 Co-ordinates
- (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

CHAPTER

FOUR

INDICES AND TABLES

- genindex
- modindex
- search