

# SUR ICG meeting 5

## 23 September 2020

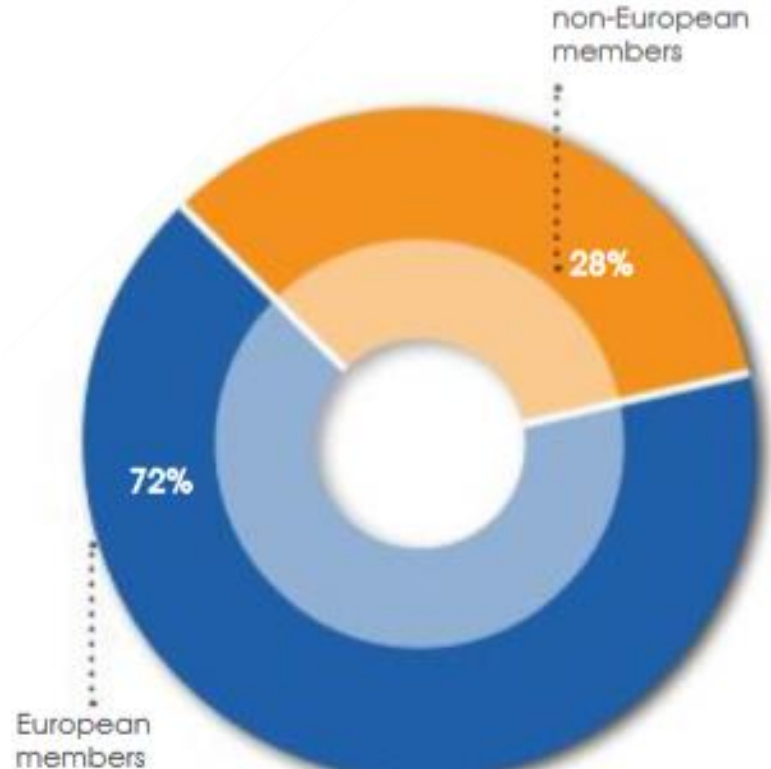


Christian Schleifer-Heingärtner  
Secretary General



# EUROCAE facts and figures

- 330+ Members (+10% p.a.)
  - 146 in 2013
- 48 active working groups
  - 26 in 2010
- 3300+ experts





# Inputs for Standardisation





# Global coordination



Intern. SDO  
SRT



Listed as SDO

WTO OMC



50 % joint WGs



10 % joint WGs



EUSCG



EASCG



# R&D – standardisation – deployment

## R&D



## Standardisation & Regulation



## Deployment





# EUROCAE process

- Transparent and open process
- Consensus driven development approach
- Standards validation
- Open consultation
- Worldwide recognition
- Worldwide application
- Open for worldwide participation
- By the industry – for the industry





# EUROCAE domains of activities

- **Avionics**
- **Communication**
- **Navigation**
- **Surveillance**
- ATM Systems
- Airports
- SWIM
- Electric
  - Lightning protection
  - High Voltage

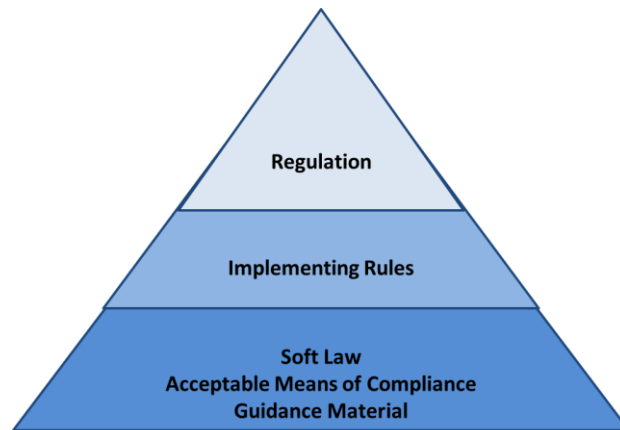


- Security
- AIS / MET
- RPAS/VTOL & GA
- Miscellaneous
  - Fuel Cells
  - Hybrid propulsion
  - Space
  - Ice detection
  - C-UAS
  - NGAP
  - COVID-19



# Regulation – Standard

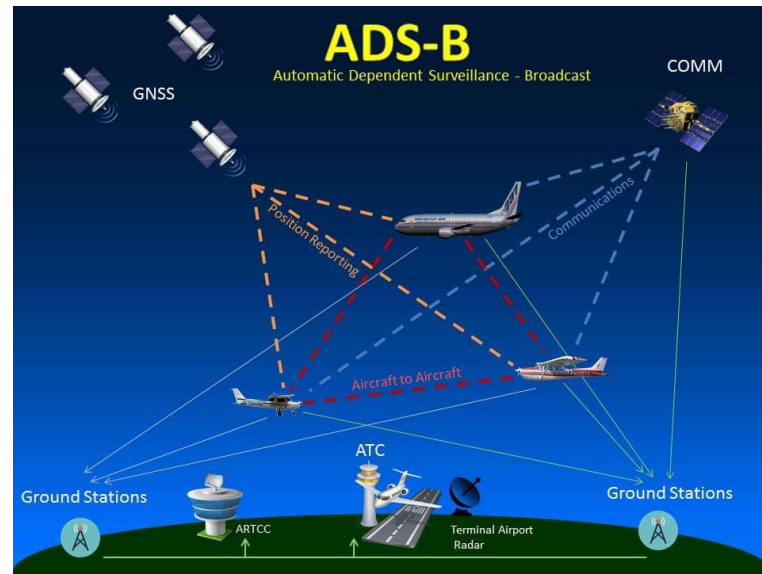
- PB & RB regulations by EASA, FAA, ICAO, ...
  - Reference to industry standards
- Standards reaction to regulation
- Forward looking
  - In anticipation of regulatory requirements
- Referenced by the regulator
  - EASA, EU Leg, FAA, ICAO
- (E)TSO – MOPS, SW, Environment





# WG-49 Mode S Transponders

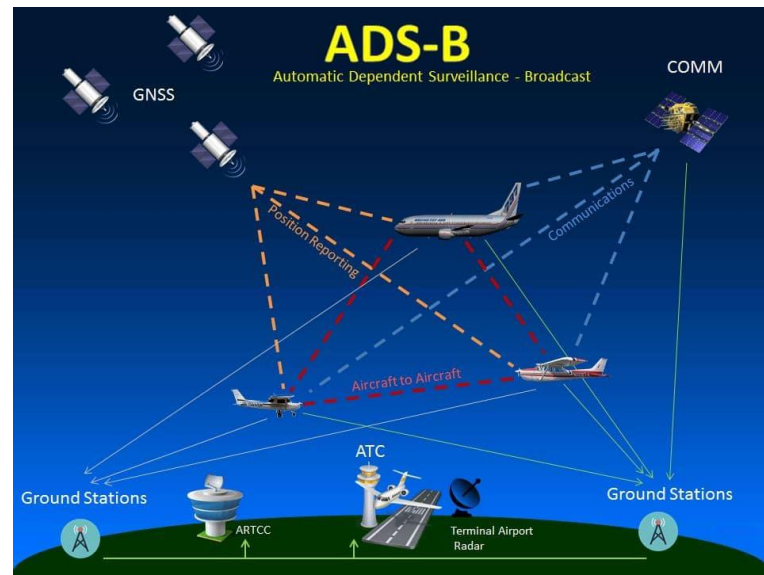
- Revision Transponder MOPS
  - ED-73F/DO-181F currently finalised
  - Significant improvements such as
    - Phase Modulation Overlay
    - Support to ACAS X Applications
    - New Transponder Register formats
    - Transmitter output limitations
    - Reply-Rate Monitoring . . .
  - Publication: December 2020
  - To come: Revision of ED-115 (MOPS for Light Aviation SSR Transponders)





# WG-51 ADS-B

- Ground and aircraft elements of ADS-B
- SG-1: MOPS for 1090 Extended Squitter
  - ED-102B/DO-260C currently finalised
  - Significant improvements such as
    - Phase Modulation Overlay
    - Weather Reports
    - Support to FIM Applications
    - Reply-Rate Monitoring . . .
  - Publication: December 2020





# WG-51 ADS-B

- ➔ SG-3: Airborne/Ground Surveillance Appl.
  - ➔ ED-236A/DO-361A FIM MOPS
    - Improvements to trajectory calculation
    - CPDLC and ATS Winds applications
    - Downlinking of FIM Information
    - Alignment with ED-102B/DO-260C . . .
    - Publication: March 2020
  - ➔ Change 1 (Test Vectors) currently developed





# WG-51 ADS-B

## → SG-4: ADS-B and Multilateration Ground System

### → ED-129C TS for an ADS-B Ground System

- Lessons learned from implementation
- Error correction
- Alignment to ED-261 (GEN-SUR SPR)
- Publication: End 2020

### → ED-142A TS for an MLAT System

- Lessons learned from implementation
- Error correction
- Alignment to ED-261 (GEN-SUR SPR)
- Requirements Composite ADS-B/MLAT System
- Publication: End 2020





# WG-102 GEN-SUR SPR

- Safety & Performance Requirements for a Generic Surveillance System (ED-261)
  - Operation Driven Approach
  - Logical end-to-end surveillance system
  - Compatible with EUROCONTROL ESASSP (Conformance testing)
  - Comment resolution ongoing
  - Publication end of 2020





# WG-103 INCS System

- Independent Non-Cooperative Surveillance System
  - TS for non-cooperative surveillance sensors
  - System agnostic
  - Consideration of technology specific requirements (e.g. due to frequency)
  - Publication end of 2021





# Other relevant EUROCAE activities

- Software qualification
  - Low risk applications WG-117
  - ED suite for Air- and Ground equipment
- Artificial intelligence
  - WG-114
- Cyber Security
  - Full set for airborne and
  - ED-205 ground equipment (ATM)





# WG-41 A-SMGCS



## → Scope

- Development of standards for A-SMGCS in alignment with EUROCONTROL operational concepts and requirements, SESAR, EASA and ICAO provisions
- Link to Pilot Common Project PCP

## → Deliverables

ED-87D	MASPS for A-SMGCS including new Airport safety Support Service Routing Service and Guidance Service	Published
ED-87E	MASPS for A-SMGCS including Airport Safety Support Service Routing Service and Guidance Service	2022
ED-xxx	Interop Document on Surveillance, Routing, Safety Support	2021
ED-xxx	Interop Document on Guidance Service data exchange	2022



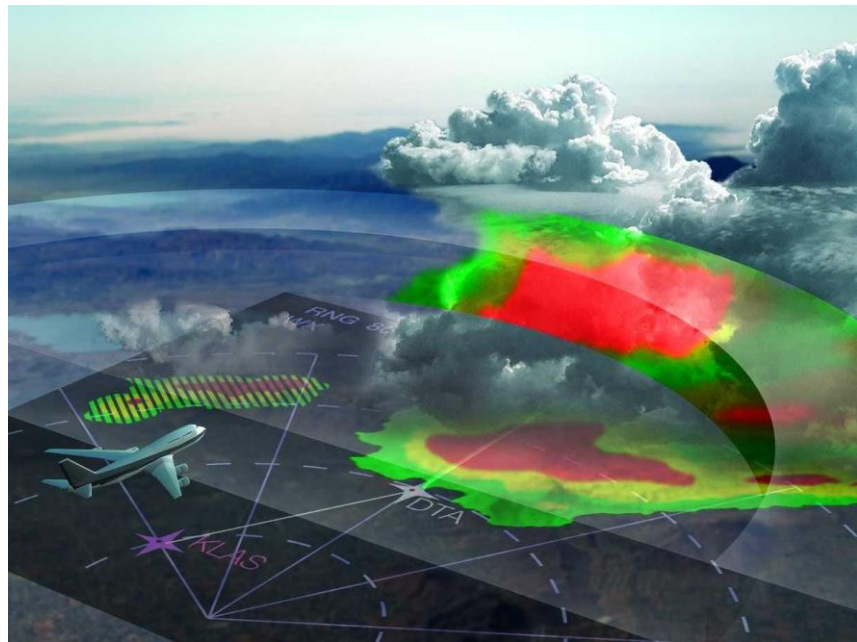
# WG-76 AIS/MET Datalink Services

→ Joint with RTCA SC-206

→ 13 Services

- Downlink / Uplink / Crosslink
- Datalink technology agnostic
- SWIM compliant
- Weather and AIM Data

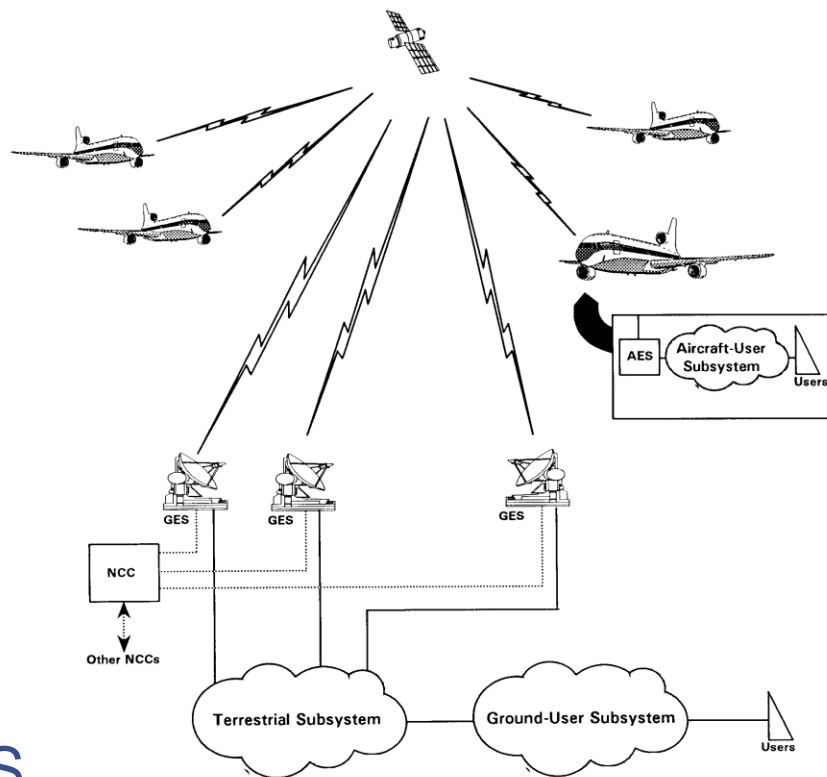
→ Publication: End 2021





# New Air-Ground Data Link Technologies – WG-82

- Airport surface: AeroMACS - surface data-link standard derived from IEEE 802.16 – 2009 WIMAX Forum standards
- Satellite: Satcom data-link - Standardisation of SATCOM Performance Class A and Class B systems
- En route/TMA L band systems: Future Terrestrial Datalink – LDACS





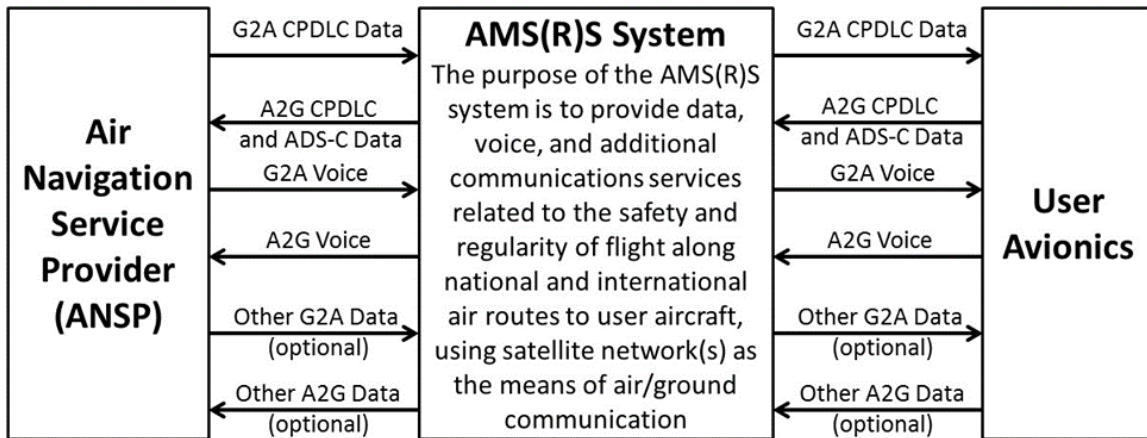
# New Air-Ground Data Link Technologies – WG-82

MASPS for AMS(R)S Data and Voice Communications Supporting Required Communications Performance (RCP) and Required Surveillance Performance (RSP)

ED-242C: Publication target Q3/2021

C revision to include considerations on:

- IRIDIUM CERTUS system
- interference analysis INMARSAT SBB and IRIDIUM CERTUS.
- analysis on potential usage of INMARSAT SBB as a command and control link for RPAS.

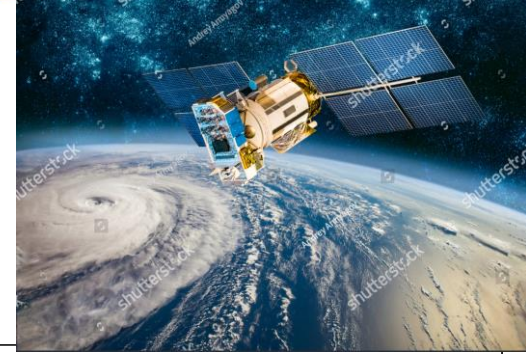




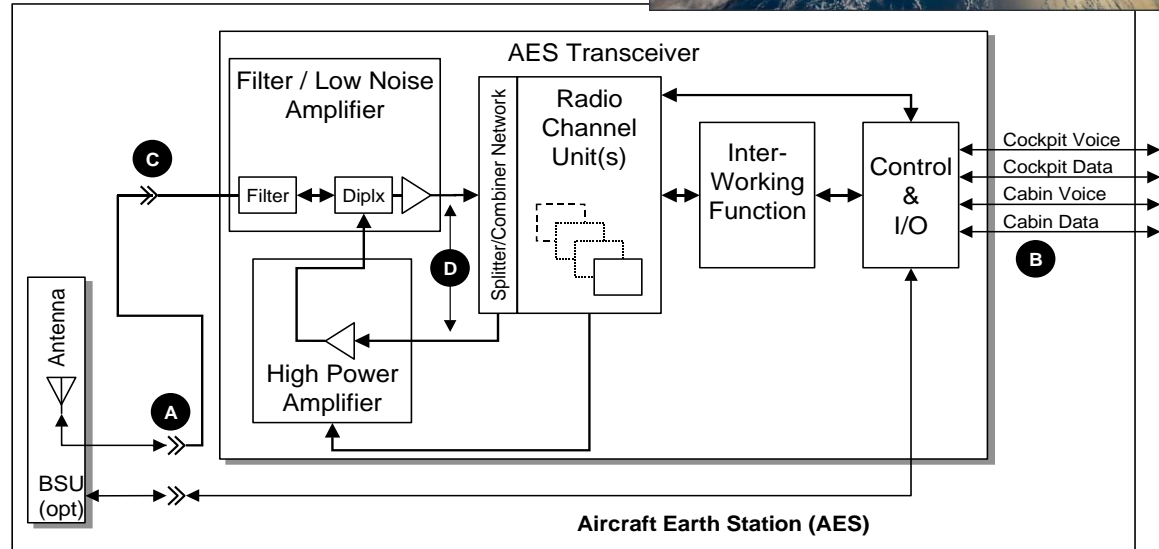
# New Air-Ground Data Link Technologies – WG-82

Minimum Operational Performance Standards for Avionics Supporting Next Generation Satellite Systems (NGSS)

ED-243C: Publication target Q3/2021



C revision to include considerations on:  
→ IRIDIUM CERTUS system





# WG-85 4D Navigation

# WG-107 DME Infrastructure for PBN

## → Complementary Work Programmes

→ WG-85: Airborne systems (joint RTCA SC-227)

→ WG-107: Ground environment

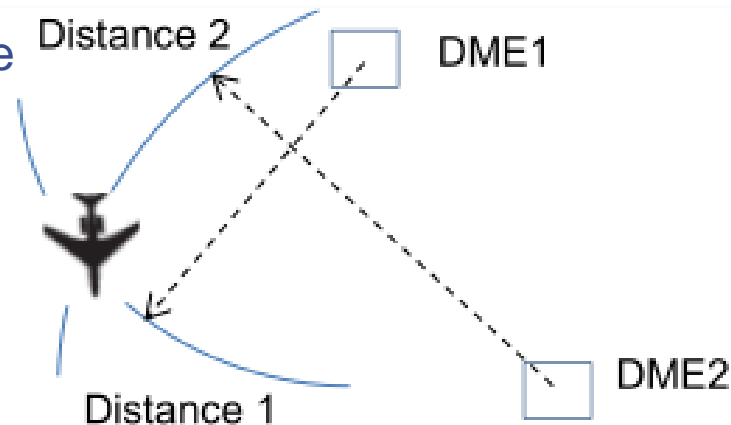
Improve robustness against GNSS outages

Permit PBN Operations without GNSS

Compatibility with airborne surveillance

→ Publication: WG-85: Q2/2022 (ED-75E)

→ Publication: WG-107: Q2/2022  
(ED-57A and new MASPS)



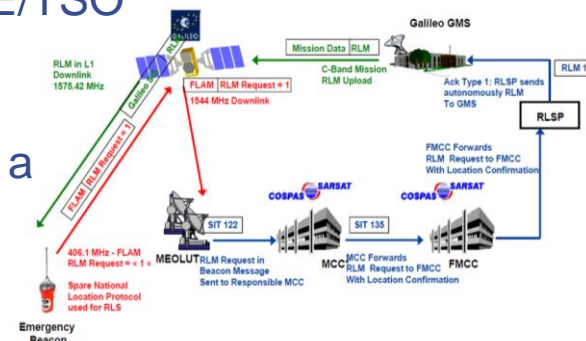


# WG-98 Flight Tracking – ELT - RLS

- Disappearance of AF447 & MH370
- ICAO Global Aviation Distress and Safety System (GADSS)
- WG-98
  - ED-237 MASPS for in-flight event detection and triggering criteria → ICAO Annex 6, Doc 10054
  - ED-62B/DO-204B MOPS for new generation ELTs → E/TSO
- Next step: Return Link Service
  - Remotely activate ELT from ground to localise in-flight a non-cooperative aircraft, improve the SAR phase
  - MASPS for ELT RLS – expected Q2/2021



## Return Link Services Concept





# WG-100 Remote/Virtual Tower

- ED-240 is the only technical standard to deal with remote tower operations
- It is proposed as guidance on the implementation of the remote tower concept
- The update ED-240B to deal with data fusion from systems/sensors as PSR, SSR, SMR, WAM/MLAT and/or ADS-B
- WG-100 to address future developments concerning the remote tower concept



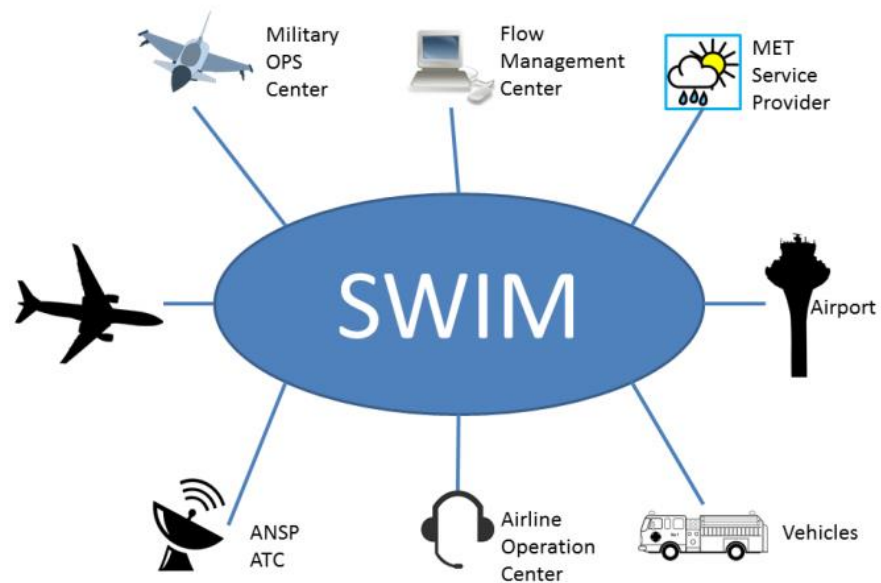


# FREQUENTIS DFS AEROSENSE



# WG-104 SWIM Services

- Specification of SWIM Services
- Material supporting future service specifications
  - ED-254 Arrival Sequence Service Performance Standard - published
  - ER-018 Guidelines for Standardisation of SWIM Services - published
  - SWIM Service Specification Template and Methodology – publication end of 2020

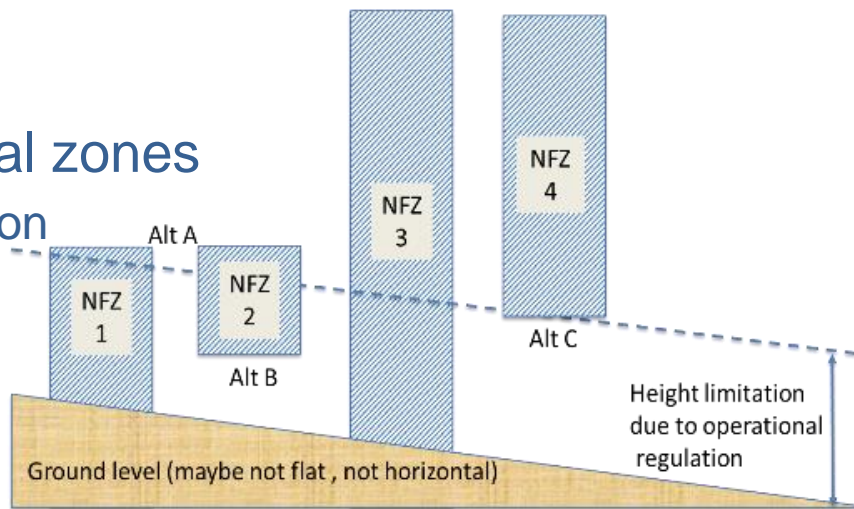




# WG – 105 UTM/U-Space

## ED-269 Geofencing

- UAS airspace limitation
- data provided by State on geographical zones
  - detect potential breach of airspace limitation
  - assists the Remote Pilot
    - alerting the pilot, “Geo-awareness”
  - automatic mode, prevents the UA to penetrate in a forbidden airspace
- Addresses geofencing, geo-awareness and automatic geofencing

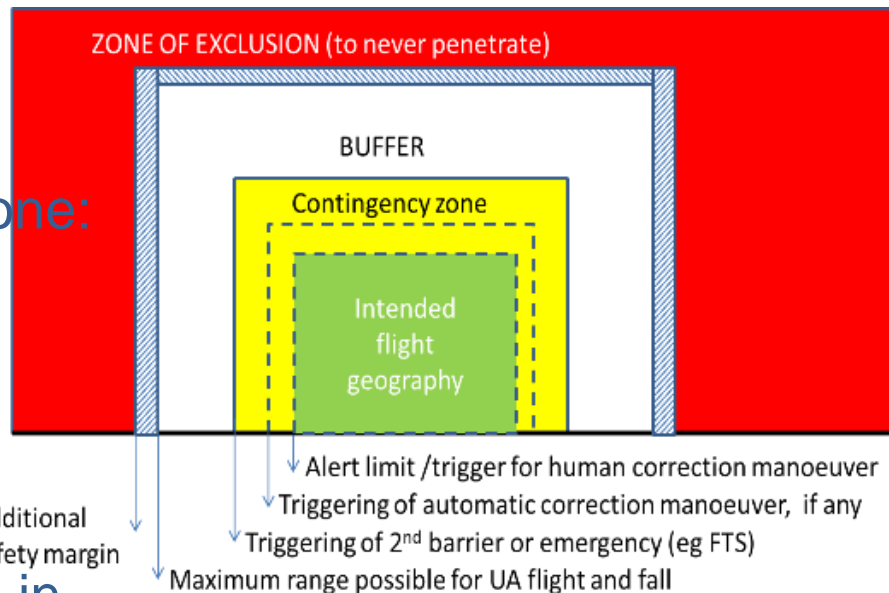




# WG – 105 UTM/U-Space

## ED-270 Geocaging

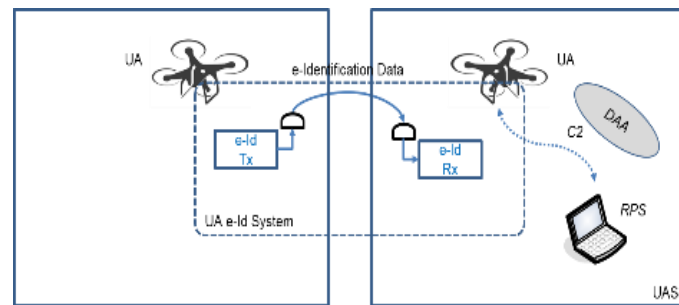
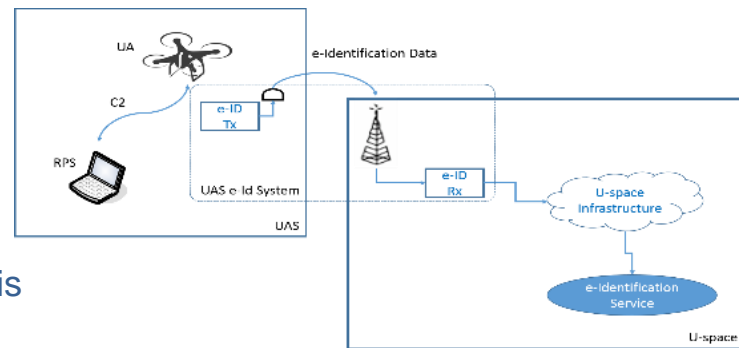
- UAS function pre-defined OPS zone:
  - provides an alert before exiting
  - automatic mode, prevent exiting
  - Potential use of FTS (Flight Termination System)
- Mean to comply to applicable regulations
- Answers to requirements set forth in SORA step #9
  - Adjacent Area/Airspace Considerations





# WG – 105 UTM/U-Space

- Draft ED-282 includes definition of safety dataset:
  - Situational Awareness, Conflict Management, Geo-fencing
  - Other essential services
    - Monitoring, Emergency Management, Recording and Analysis
- 4 categories of data considered:
  - Dynamic Status Data: e.g. Lat, Long, Alt, Velocity, Vertical rate...
  - Ident&Static Data: e.g. ident/reg., capabilities, health status, figure of merit...
  - Intention Data: e.g. Next waypoint / trajectory change points...
  - App Specific Data: e.g. Take-off location
- MOPS min. requirements: range, resolution, accuracy, refresh rate...
- Guidance on the validation: end-to-end data exchange



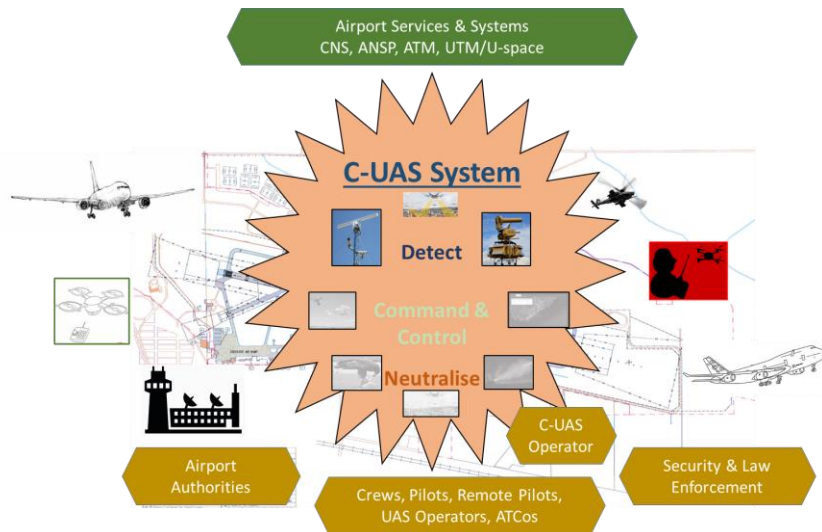


# WG-115 Counter UAS



→ Developing standards to support the safe and harmonised implementation of C-UAS Systems for protection of airports against unauthorised UAS

- Q3/2020 OSED for Counter-UAS in controlled airspace
- Q2/2021 SPR for non-cooperative UAS detection systems
- Q2/2021 INTEROP for Counter-UAS systems





# Shaping global standards through collaboration

- WW interoperability needs international inputs to develop globally applicable standards
  - Developed by all interested parties
- To support global aviation targets & address global aviation challenges
  - GANP, ASBU, GASP
  - Regulations
  - Regional modernisation programmes



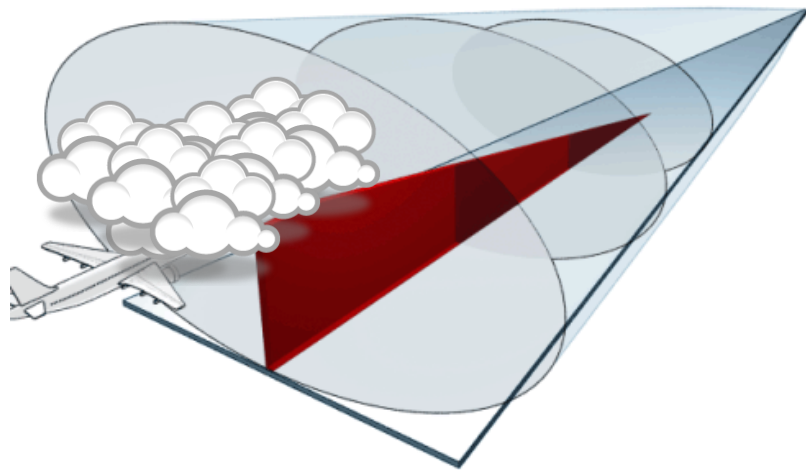


# EUROCAE Role

→ Strong, reliable, global partner for

- Industry
- R & D
- user and
- regulator

→ to reach the destination





# For further information...



[www.eurocae.net](http://www.eurocae.net)

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# EUROCAE Working Groups

→ More information & detailed work programme: <https://eurocae.net/about-us/working-groups/>

- |         |   |                      |
|---------|---|----------------------|
| → WG-14 | Environment   | RTCA SC-135, SAE AE4 |
| → WG-28 | Ground Based Augmentation Systems                             | RTCA SC-159          |
| → WG-31 | Lightning   | SAE AE2              |
| → WG-41 | Advanced Surface Movement Guidance & Control System (A-SMGCS) | ETSI TC AERO         |
| → WG-44 | Aeronautical Databases  | RTCA SC-217          |
| → WG-49 | Mode S Transponders   | RTCA SC-209          |
| → WG-51 | ADS-B   | RTCA SC-186          |
| → WG-59 | Flight Data Processing (FDP) Interoperability                 |                      |



# EUROCAE Working Groups

→ WG-62	GALILEO, DFMC, SBAS	RTCA SC-159
→ WG-63	Complex Aircraft Systems	SAE S-18
→ WG-68	Altimetry	SAE A-4
→ WG-72	Aeronautical Systems Security	RTCA SC-216, SAE S-18
→ WG-75	TCAS	RTCA SC-147
→ WG-76	AIS/MET Datalink Applications	RTCA SC-206
→ WG-78	Standards for Air Traffic Data Communication Services (currently dormant)	RTCA SC-214
→ WG-79	Enhanced Vision Systems / Synthetic Vision Systems (EVS - SVS)	RTCA SC-213



# EUROCAE Working Groups

- |         |  |                          |
|---------|--|--------------------------|
| → WG-80 | Hydrogen Fuel Cell Systems                               | SAE AE7                  |
| → WG-81 | Interoperability of ATM Validation Platforms             |                          |
| → WG-82 | New Air-Ground Datalink Technologies                     | RTCA SC-223, RTCA SC-222 |
| → WG-83 | Airport Foreign Object Debris (FOD)<br>Detection Systems |                          |
| → WG-85 | 4D Navigation  | RTCA SC-227              |
| → WG-88 | Onboard Weight and Balance Systems                       |                          |
| → WG-89 | Revision of ETSO C-16 (Pitot Tubes)<br>(dormant)         | SAE AC-9C                |
| → WG-92 | VDL Mode 2   | RTCA SC-214-VDL SG       |



# EUROCAE Working Groups

- |          |   |                        |
|----------|---|------------------------|
| → WG-95  | Inflight Ice Detection Systems (dormant)        | SAE AC-9C, RTCA SC-230 |
| → WG-96  | Wireless On Board Avionics Network              | RTCA SC-236            |
| → WG-97  | Interoperability of Virtual Avionics Components |                        |
| → WG-98  | Aircraft Emergency Locator Transmitters         | RTCA SC-229            |
| → WG-101 | Runway Overrun Alerting and Avoiding System     | (dormant)              |
| → WG-102 | GEN-SUR SPR Development                         |                        |
| → WG-103 | Independent Non-Cooperative Surveillance        |                        |
| → WG-104 | SWIM Services                                   |                        |
| → WG-105 | UAS   |                        |



# EUROCAE Working Groups

- WG-106 Electronic Flight Bag (EFB)
- WG-107 RNP Reversion based on DME/DME
- WG-108 ATN/IPS RTCA SC-223
- WG-109 Runway Weather Information Systems
- WG-100 Remote and Virtual Towers (RVT)
- WG-110 HTAWS RTCA SC-237
- WG-111 A-CDM
- WG-112 VTOL
- WG-113 Hybrid Electric Propulsion SAE E-40



# EUROCAE Working Groups

- |          |   |             |
|----------|---|-------------|
| → WG-114 | Artificial Intelligence   | SAE G-34    |
| → WG-115 | Counter-UAS   | RTCA SC-238 |
| → WG-116 | High Voltage  |             |
| → WG-117 | Topics on Software Advancement  | RTCA SC-240 |
| → WG-118 | Crash-Protected and Lightweight Flight Recorders                                |             |
| → WG-119 | Radar Altimeter   | RTCA SC-239 |
| → WG-120 | Technical Means for identifying potential<br>COVID-19 carriers among passengers |             |
| → WG-121 | Aircraft Cleaning and Disinfection  | RTCA SC-241 |
| → WG-122 | Virtual Centre  |             |