Airbus Amber

Outlook On Future Surveillance Capabilities

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Jean-Baptiste BERTHIER, Surveillance System Engineer
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Agenda

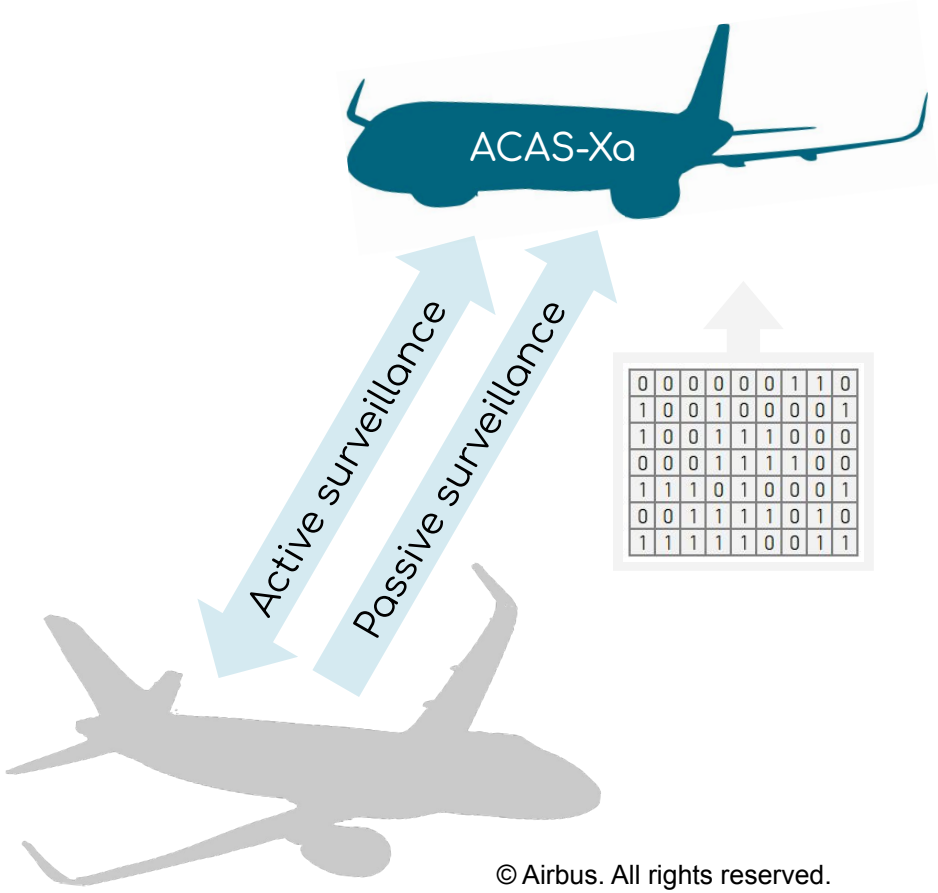
- ACAS-X Future Fleet Capability
- ADS-B OUT Future Fleet Capability
- ADS-B IN Current and Future Fleet Capabilities
- Supporting Surveillance Systems Architectures
- Conclusion

ACAS-X Future Fleet Capability

- **ACAS-Xa** is the baseline system successor to TCAS II
- **ACAS-Xo** is an extension to ACAS-Xa with modified threat resolution logic for particular operations, like closely spaced parallel approaches

- ACAS-Xa will be progressively introduced in new development to comply with new certification basis (DO-385)

- ACAS-Xo may be of interest for the future operations such as wake retrieval

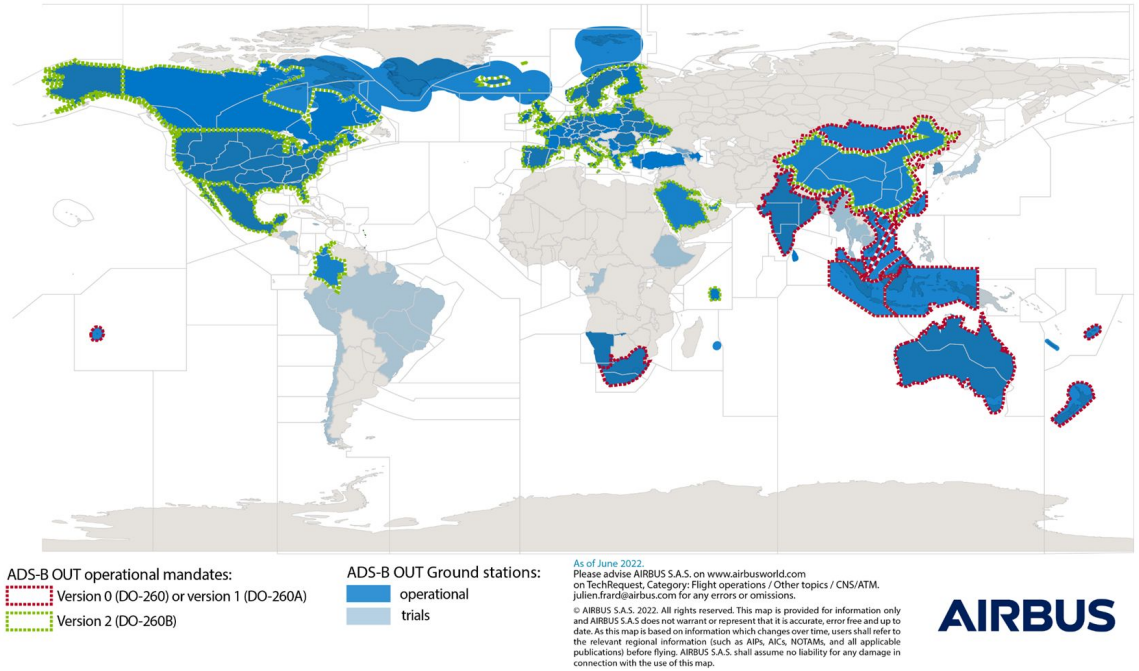


ADS-B OUT Future Fleet Capability

- Previous **ADS-B OUT Version 2** (corresponding to **DO-260B**) mandated in many regions worldwide allowing for an alternative for Secondary Surveillance Radars use

- DO-260B in forward fit and retrofit all across the fleet

- ADS-B OUT Version 3 progressively introduced in new development (comply to DO-181F and DO-260C)



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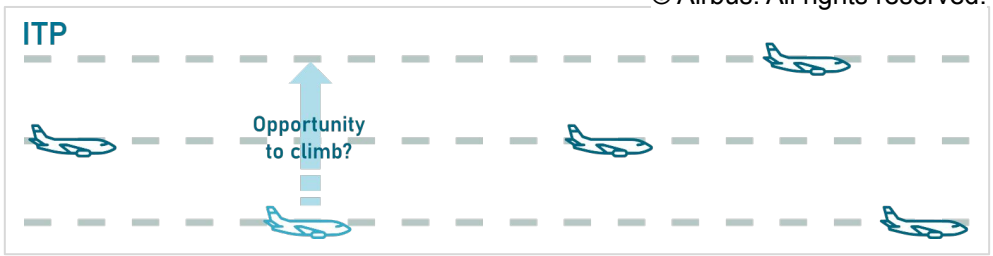
ADS-B IN Current Capability - ATSAW & ITP

- Airbus developed solution - **ATSAW (Airborne Traffic Situation Awareness)** with **ATSA-AIRB, ATSA-VSA** and **ATSA-ITP** in line with DO-317 ASAS MOPS
- Available as an option (linefit and retrofit) with ATSAW provisions installed in linefit
- Very good feedback from the airline crews

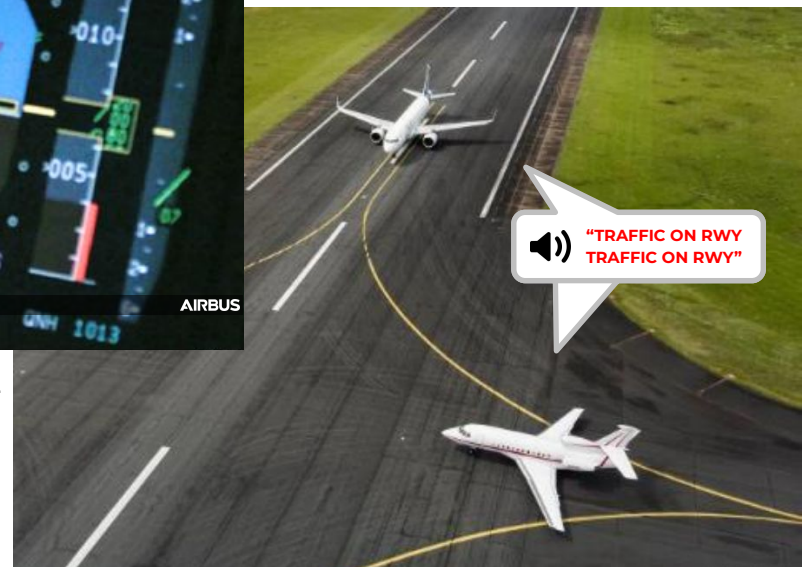
ATSA: Air Traffic Situational Awareness
AIRB: Basic Airborne Situational Awareness
VSA: Visual Separation on Approach
ITP: In-Trail Procedures

A320 cockpit with ATSAW:



ADS-B IN Future Fleet Capabilities - SURF-A (Airbus solution)

- AIRBUS defined a concept with alerts only and without traffic display, called **SURF-A (Surface Alerting)** (Airbus solution)
  - Simplified SURF-IA (partial RTCA DO-323 coverage)
    - No airport moving map nor traffic display
    - Focused on runway environment (no taxiways coverage)
  - Airbus goal: **allowing for additional safety net for large number of aircraft with easy to retrofit solution**
    - Traffic display, traffic selector and dedicated control pages are not required (ATSAW ATSA-AIRB is not a prerequisite)
  - Under development



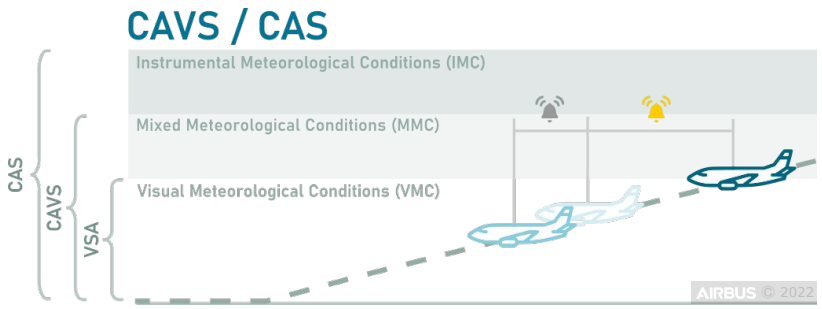
ADS-B IN future capabilities - CAVS/CAS & i-IM

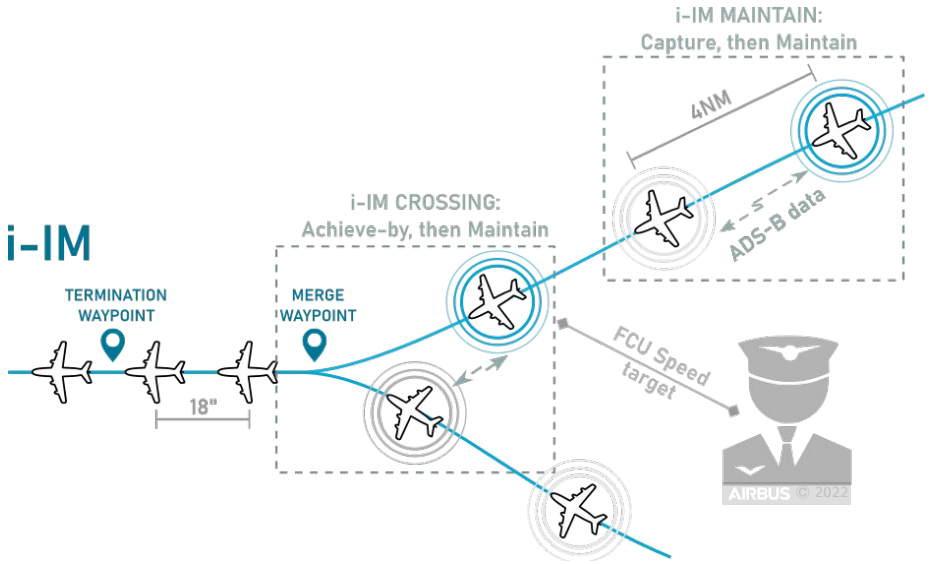
- **CAVS/CAS** and **i-IM** seamless cockpit integrated solution:
  - i-IM supports a subset of Interval Management maneuvers
  - ATSAW activated as a prerequisite

- Need of appropriate ground infrastructure and air traffic controllers' buy-in to support and see benefits from CAS and i-IM

- Looking forward to outcomes of FAA ADS-B IN activities in the context of FAA-AAL-ACSS AIRS project

- Under feasibility study



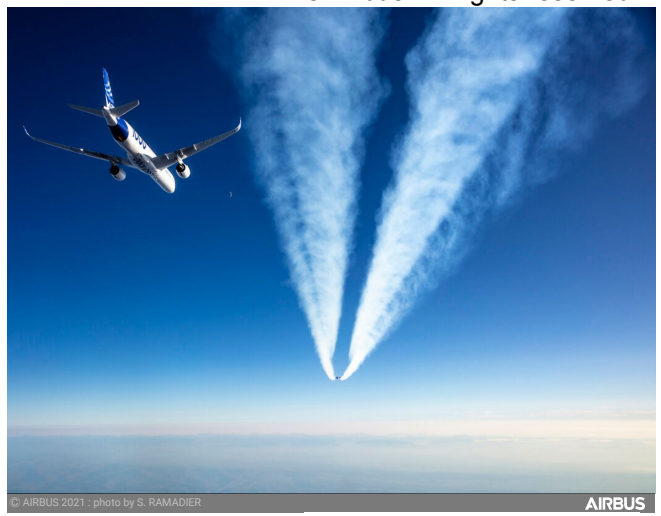


Supporting Surveillance Systems Architectures

- Integration within a single cabinet is beneficial:
  - Cost saving
  - Weight saving
  - Improved physical footprint
  - Drag saving

Conclusion

- **Airbus actively contribute and support the definition of future surveillance systems and functions**
  - To continuously improve safety and awareness
  - To support airspace efficiency and operations:
    - Improve traffic capacity
    - Tackling the increasing number of traffic like UAVs and managing the resulting spectrum occupancy
  - To support aircraft sustainability:
    - Solution to support wake retrieval operations
    - Better integrations (number of antennas, weight …)
    - Optimized trajectories



Abbreviations

AAL	American Airlines
ACAS X/Xa/Xo	Airborne Collision Avoidance System X/Xa/Xo
ACSS	Aviation Communication and Surveillance Systems (company)
ADS-B IN/OUT	Automatic Dependent Surveillance Broadcast IN / OUT
ADS-R	Automatic Dependent Surveillance Rebroadcast
AIRB	Basic Airborne Situational Awareness
AIRS	ADS-B In Retrofit Spacing
ASAS	Aircraft Surveillance Applications System
ASPA-S&M	Airborne Spacing - Sequencing and Merging
ATSA	Air Traffic Situational Awareness
ATSAW	Airborne Traffic Situation Awareness (Airbus name)
CAS	CDTI Assisted Separation
CAVS	CDTI Assisted Visual Separation
CDTI	Cockpit Display of Traffic Information
(e)TSO	(European) Technical Standard Order
FIM	Flight-Deck Internal Management
ICAO GANP	ICAO Global Air Navigation Plan
i-IM	initial Interval Management
IMC	Instrumental Meteorological Conditions
ITP	In-Trail Procedures
MMC	Mixed Meteorological Conditions
MOPS	Minimum Operational Performance Standard
RTCA DO-xxx	Radio Technical Commission for Aeronautics document
SURF	Basic Surface Situational Awareness
SURF-A	Surface Alerting
SURF-IA	Enhanced Traffic Situational Awareness with Indications and Alerts
TCAS	Traffic Alert and Collision Avoidance System
TIS-B	Traffic Information Services - Broadcast
UAT	Universal Access Transceiver
UAV	Unmanned Aerial Vehicle
VMC	Visual Meteorological Conditions
VSA	Visual Separation on Approach
XPDR	Transponder

Thank you

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