



ATC21 — Composite surveillance (ADS-B/WAM)

This implementation objective is addressing a surveillance system that exploits the similarities between the two surveillance techniques (ADS-B and WAM) and combines them into a single system. The term composite is used to signify that various system components and data items are shared whilst ensuring that the required degree of channel autonomy/independence is retained. ADS-B information received by WAM system is evaluated and if matching with WAM information extracted by others methods, then it's used in the WAM output. Information is then periodically re-evaluated.

The exploitation of synergies between the two surveillance techniques into a “composite surveillance system” supports a number of benefits and performance enhancements, compared with the use of 2 separated systems, WAM and ADS-B. These include:

- cost savings, achieved through the co-mounting of system components into a single unit and the associated savings in terms of site costs, communications and efficient utilization of certain common components
- Use of ADS-B message information to support passive acquisition of an aircraft, reducing the 1030/1090 MHz footprint of a WAM surveillance system, especially a reduction in the number of 1030 MHz interrogations.
- cost effective security mitigation techniques, based on the use of additional ‘raw’ RF and timing data (not available in other components of a surveillance infrastructure), which can be used to derive additional indicators, such as Ground based ‘confidence/credibility’ measure enabling e.g. the early identification of anomalous avionic behaviour, or spoofed ‘ADS-B transmissions’.
- Means for performance monitoring and alerting of faults in the system, by supplementing the WAM channels BITE with the comparison between the ADS-B position and WAM channel data as a way to detect failure conditions.
- Improvement of the performance of the ADS-B channel, e.g. by enabling the allowance of temporary reductions in ADS-B quality indicator values, by resolving ADS-B data-to-track association issues related to non-unique 24-bit addresses, by reducing the effects on the resulting along-track horizontal position error.

NOTE 1: The aircraft systems are assumed compliant with the EU Regulation 1207/2011 (Surveillance Performance and Interoperability Implementing Rule - SPI IR) as amended..

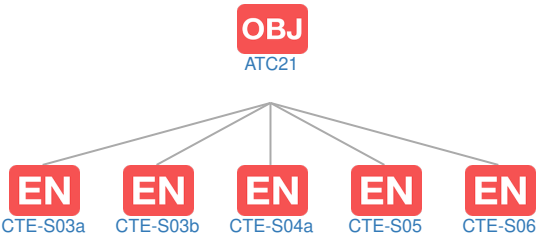
NOTE 2: This objective should be seen as a possible mean of compliance with the applicable Regulations. It is without prejudice to the choice of the ANSPs to deploy the most appropriate surveillance solution taking into account the local conditions.

NOTE FOR MILITARY AUTHORITIES: It is the responsibility of each military authority to review this Objective IN ITS ENTIRETY and address each of the SLoAs that the military authority considers RELEVANT for itself. This has to be done on top and above of the review of "MIL" SLoAs which identify actions EXCLUSIVE to military authorities.

Edition	2022
Stakeholders	Regulator / Air Navigation Service Provider
Type	SESAR
Scope	Local
Status	Initial

Context

Related Elements


















Applicability Area(s) and Timescales

Applicability Area: All ECAC+ States
(Subject to local needs)

Timescales	From	By	Applicable to
IOC used for Analytics functioning only - not for implementation planning	15-09-2020	-	Applicability Area
FOC used for Analytics functioning only - not for implementation planning	-	31-12-2030	Applicability Area

Links to ATM Master Plan Level 2

Enablers

Code	Title	IOC	Related Elements
CTE-S03a	ADS-B station for NRA surveillance	31-12-2008	    
CTE-S03b	ADS-B station for RAD and APT surveillance	31-12-2020	     
CTE-S04a	Wide Area Multilateration (WAM)	31-12-2007	    
CTE-S05	Gradual rationalisation of conventional surveillance infrastructure (ADS-B/WAM vs SSR and MSPSR vs PSR)	12-09-2018	   
CTE-S06	Composite Surveillance	-	   

Links to SESAR Solutions

Code	Title	Program	Related Elements
No record found			

Links to PCP ATM Sub-Functionalities

Code	Title	Related Elements
No record found		

 ICAO Block Modules: No associated data

References

Applicable legislation

Regulation (EU) No 2020/587 amending Regulation (EU) No 1207/2011 (SPI)

Applicable ICAO Annexes and other references

None

Deployment Programme 2022

-

Operating Environments

-

Expected Performance Benefits

Safety	-
Capacity	-
Operational efficiency	-
Cost efficiency	System provides two surveillance layers sharing HW components, with the associated cost reduction.
Environment	-
Security	Increases security of ADS-B surveillance layer by verification of received information.

Stakeholder Lines of Action

Code	Title	From	By	Related Enablers
REG01	Mandate the airborne carriage and operation of suitable equipment (ADS-B transponders)	15-09-2020	01-01-2030	
ASP01	Deploy composite surveillance ADS-B/WAM systems	15-09-2020	01-01-2030	
ASP02	Develop a local safety assessment	15-09-2020	01-01-2030	

Supporting Material

Title	Related SLoAs
EASA - CS ACNS - Certification Specifications for Airborne Communications Navigation and Surveillance - Issue 3 / 05/2021 https://www.easa.europa.eu/document-library/certification-specifications/cs-acns-issue-3	REG01
EC - COMMISSION IMPLEMENTING REGULATION (EU) 2017/373 - (OJ L 62, 8.03.2017, p. 1) - COMMISSION IMPLEMENTING REGULATION (EU) 2017/373 of 1 March 2017 laying down common requirements for providers of air traffic management/air navigation services and other air traffic management network functions and their oversight, repealing Regulation (EC) No 482/2008, Implementing Regulations (EU) No 1034/2011, (EU) No 1035/2011 and (EU) 2016/1377 and amending Regulation (EU) No 677/2011 10/2011 https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32017R0373&from=EN	ASP02
EUROCAE - ED-129B - EUROCAE Technical Specifications for ADS-B Ground system (ED-129B) https://eshop.eurocae.net/eurocae-documents-and-reports/ed-129b/	ASP01
EUROCAE - ED-142A - EUROCAE Technical Specification for Wide Area Multilateration (WAM) systems (ED142A) -	ASP01
EUROCONTROL - Air Navigation Systems Safety Assessment Methodology (SAM) - Version 2.1 / 11/2006 https://www.eurocontrol.int/tool/safety-assessment-methodology	ASP02
ICAO - Doc 9871 - Technical Provisions for Mode S Services and Extended Squitter - Advanced Edition / 04/2012 https://store.icao.int/	REG01
SJU - SESAR Solution 114: Data Pack for Composite surveillance (ADS-B/WAM) Data Pack https://www.sesarju.eu/sesar-solutions/composite-surveillance-ads-b-wam	ASP01, ASP02

Consultation & Approval

Working Arrangement in charge	-
Outline description approved in	-
Latest objective review at expert level	-
Commitment Decision Body	Provisional Council (PC)
Objective approved/endorsed in	05/2020
Latest change to objective approved/endorsed in	-