

International Civil Aviation Organization


ASBU/SIP/Lima/2012-WP/24C

Aviation System Block Upgrades Module N° B0-84

Initial Capability for Ground-based Cooperative Surveillance

Workshop on preparations for ANConf/12 – ASBU methodology
(Lima, 16-20 April 2012)

Module N° B0-84



Initial Capability for Ground-based Cooperative Surveillance

Summary	This module provides initial capability for lower cost ground surveillance supported by new technologies such as ADS-B OUT and wide area multilateration systems	
Main Performance Impact	KPA- 02 Capacity, KPA-03 Efficiency, KPA-09 Predictability KPA-10 Safety	
Operating Environment/Phases of Flight	All airborne flight phases in continental or subsets of oceanic airspace and on aerodrome surfaces	
Applicability Considerations	This capability is characterized by being dependent and cooperative. The overall performance is affected by ADS-B out performance and equipage.	
Global Concept Component(s)	CM – Conflict Management	
Global Plan Initiatives (I)	-9 Situational awareness -16 Decision support and alerting systems	
Main Dependencies		
Global Readiness Checklist		Status (ready now or estimated date)
	Standards Readiness	Ready now
	Avionics Availability	Ready now
	Ground Systems Availability	Ready now
	Procedures Available	Ready now
	Operations Approvals	Ready now

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Module N° B0-84 - Baseline



- Air to ground aircraft position and surveillance is accomplished
 - Primary Radar; and
 - Secondary Radar

Module N° B0-84 – Change Brought by the Module



- ADS-B:
 - advanced surveillance technology allowing avionics to broadcast an aircraft's identification, position, altitude, velocity, etc
- Multilateration :
 - new technique providing independent cooperative surveillance.
 - initially deployed on main airports to make the surveillance of aircraft on the surface. The technique is now used to provide surveillance over wide area (WAM).

Module N° B0-84 – Intended Performance Operational Improvement



Safety	Reduction of the number of major incidents. Support to Search and Rescue
Capacity	Typical separation minima are 3 NM or 5 NM enabling a significant increase in traffic density compared to procedural minima.
CBA	<p>either comparison between procedural minima and 5NM separation minima would allow an increase of traffic density in a given airspace</p> <p>-or comparison between installing/renewing SSR Mode S stations using Mode S transponders and installing ADS-B OUT (and /or Multilateration systems).</p>

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Module N° B0-84 – Necessary Procedures (Air & Ground)



- The relevant PANS-ATM (Doc 4444) provisions are available.

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Module N° B0-84 – Necessary System Capability



- **Avionics**
 - For ADS-B surveillance services, aircraft must be equipped with ADS-B OUT.
 - For multilateration, aircraft need to be equipped with Mode S radar transponders
- **Ground Systems**
 - Units providing surveillance services must be equipped with a ground-based surveillance data processing system and flight data processing system
 - Units may provide ADS-B surveillance in environments where there is full or partial avionics equipage depending on the capabilities and procedures of the ATC system.
 - ATC Systems must also be designed to enable the delivery of separation services between ADS-B-to-ADS-B and ADS-B-to-radar and fused targets

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Module N° B0-84 – Training and Qualification Requirements



- Controllers must receive specific training for separation provision, information service and search and rescue based on the ADS-B and WAM systems in use.
- Training in the operational standards and procedures are required for this module
- Qualifications requirements are identified in the regulatory requirements

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Module N° B0-84 –Regulatory/standardization needs and Approval Plan (Air & Ground)



- ***Nil***

Module N° B0-84 – Reference Documents



- ***Standards***
 - ICAO ANNEX 10 — Aeronautical Telecommunications, Volume IV 2 Aeronautical Radio Frequency Spectrum Utilization;
 - ICAO DOC 9871, Technical Provisions for Mode S Services and Extended Squitter;
 - RTCA MOPS DO260 and DO260A EUROCAE ED102 and ED102A.
- ***Procedures***
 - ICAO Doc 4444, Procedures for Air Navigation Services — Air Traffic Management;
- ***Guidance Material***
 - ICAO DOC 9924, Aeronautical Surveillance Manual;
 - ICAO Assessment of ADS-B and Multilateration Surveillance to Support Air Traffic Services and Guidelines for Implementation (Circular 326);
 - ICAO Asia Pacific: ADS-B implementation guidance document.

Module N° B0-84 Implementation - Benefits and Elements



Initial Capability for Ground-based Cooperative Surveillance

- **Benefits: Capacity and safety**
 - **Elements:**
 - **ADS-B**
 - **Multilateration**
- To be reflected in ANRF**

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