



International Civil Aviation Organization

SIP/2012/ASBU/Dakar-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  
(Dakar, 16-20 July 2012)

# Module N° B0-84

## Initial Capability for Ground-based Cooperative Surveillance



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



- 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



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

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



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



- ***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***

- Surveillance data processing system and flight data processing system
- ADS-B and/ or Multilateration

# 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

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



- ***Nil***



- **Standards**

- ICAO ANNEX 10 — Aeronautical Telecommunications, Volume IV ☐  
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.

## Initial Capability for Ground-based Cooperative Surveillance

### Benefits - Main Key Performance Areas (KPA)

KPAs	Access	Capacity	Efficiency	Environment	Safety
Applicable	N	Y	N	N	Y

### Elements:

- ADS-B

- Multilateration

To be reflected in ANRF

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