

## FIJI AERONAUTICAL INFORMATION CIRCULAR



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**AIC 03/23**  
Effective  
13 JUL 23  
ATC/OPS

# **AUTOMATIC DEPENDENT SURVEILLANCE BROADCAST (ADS-B) OUT EXCLUSIVE AIRSPACE WITHIN THE FIJI DOMESTIC SECTOR**

## **1. INTRODUCTION**

This Aeronautical Information Circular serves to notify aircraft operators on Fiji's mandate for Automatic Dependent Surveillance Broadcast (ADS-B) Out Exclusive Airspace within the Fiji Domestic Sector from **13 July 2023**.

The provision of Surveillance Control Services within the Fiji Domestic Sector commenced on 6<sup>th</sup> October 2022.

## **2. PURPOSE**

The purpose of this AIC is to inform aircraft operators and the aviation industry on Fiji's mandate for Automatic Dependent Surveillance Broadcast (ADS-B) Out Exclusive Airspace within the Fiji Domestic Sector

The guidance on the Mode S 1090 MHz Extended Squitter (ES) is detailed in Fiji Airworthiness Notice - FAN 01/13 which was revised on 10 August 2016.

## **3. APPLICABILITY**

This AIC applies to all aircraft operating within the Fiji Domestic Sector unless exempted under **paragraph 10** below.

A NOTAM will be issued in due course.

## **4. REFERENCES**

The following documents (latest edition) were referenced in compiling this AIC:

- (a) ICAO Annex 10 - *Aeronautical Telecommunications Vol. IV*;
- (b) ICAO DOC 9871 *Technical Provisions for Mode S Services and Extended Squitter*;
- (c) RTCA DO-260 *Minimum Operational Performance Standards*;
- (d) RTCA DO-260A *Minimum Operational Performance Standards*;
- (e) RTCA DO-260B *Minimum Operational Performance Standards*;
- (f) EASA AMC 20-24 *Certification Considerations for the Enhanced ATS in Non-Radar Areas using ADS-B Surveillance (ADS-B-NRA) Application via 1090 MHz Extended Squitter*;

- (g) EUROCAE ED-26—MPS for Airborne Altitude Measurements and Coding Systems;
- (h) EUROCAE ED-126—Safety, Performance and Interoperability Requirements Documents for ADS-B-NRA Application;
- (i) European Aviation Safety Agency (EASA) Acceptable Means of Compliance (AMC) 20 Amendment 3, Annex II (AMC 20-24)—Certification Considerations for the Enhanced Air Traffic System in Non-Radar Areas Using ADS-B Surveillance (ADS-B-NRA) Application

## **5. ADS-B**

An ADS-B capable aircraft uses GPS to determine its position and by means of Mode S 1090 ES broadcasts that position at rapid intervals combined with identity, altitude, velocity and other data to ADS-B ground stations which receive and distribute the data to ATM automation systems.

The processed data is displayed at the air traffic controller work position (CWP) enabling the provision of a surveillance control service.

## **6. SYSTEM DESCRIPTION**

The basic concept of ADS-B involves the broadcasting of surveillance information from aircraft via a data link.

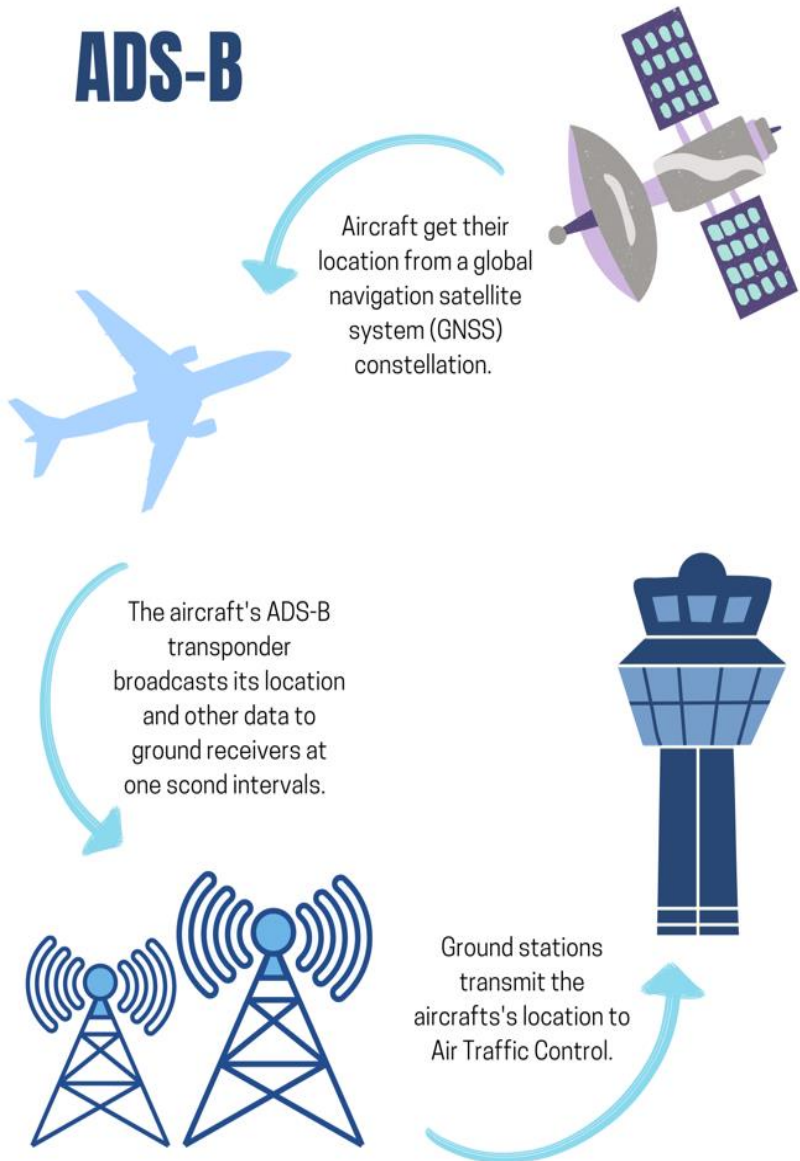
To support the ADS-B application, the overall ADS-B avionics system, herein referred to as “ADS-B System”, needs to provide the following functions:

- Adequate surveillance data provision capability;
- ADS-B message processing (encoding and generation);
- ADS-B message transmission (Mode S 1090 MHz ES airborne surveillance data-link).

Whereas the latter two functions are incorporated in the Mode S 1090 MHz ES ADS-B transmit system, the surveillance data provision is realised through various on-board surveillance data sources (e.g. horizontal position source, barometric altimetry, ATC transponder control panel).

The horizontal position accuracy and integrity requirements of the ADS-B application are associated with quality indicators which form part of the air-to-ground ADS-B message.

**Figure 1: How ADS-B Works**



## 7. FUNCTIONAL CRITERIA

In line with ED-126, the ADS-B System needs to meet the following surveillance data transmission requirements, as a minimum:

- A unique ICAO 24-bit aircraft address (contained within each ADS-B message transmission);
- Horizontal Position (latitude and longitude);
- Horizontal Position Quality Indicator(s) (position integrity for both RTCA/DO-260, DO-260A/B based ADS-B transmit systems, as well as accuracy for DO 260, DO-260A/B based ADS-B transmit systems);
- Barometric Altitude;
- Aircraft Identification;
- Special Position Identification (SPI);
- Emergency Status and Emergency Indicator;
- Version Number (in aircraft operational status message, if avionics are DO-260A/B compliant).

## 8. AIRWORTHINESS CONSIDERATIONS

For the purposes of the ADS-B application, the ADS-B System installed in the aircraft needs to be designed to deliver data that satisfy the airborne domain requirements to meet the requirements of the Fiji Air Navigation Regulation 1981, ANR 22 (Radio Equipment of Aircraft) & ANR 23 (Equipment Table – Scale Z), and Fiji Airworthiness Notice (FAN 01/13).

## 9. APPLICABLE DATES

All aircraft registered in Fiji must be suitably equipped.

From 13<sup>th</sup> July 2023 all foreign registered aircraft shall be equipped.

## 10. EXEMPTION TO THE MANDATE

This AIC shall not apply to **State** aircraft as referred to in Article 3(b) of the Chicago Convention i.e. aircraft used in military, customs and police services.

## 11. OPERATIONAL GUIDANCE

### **a. System Familiarity**

The pilot/operator of the aircraft should be familiar with the ADS-B system installed in the aircraft. The pilot should be familiar with the content of the flight manual or flight manual supplement that relates to the operation of the ADS-B system, as well as any additional documentation such as pilot guides or quick reference guides.

When familiarising with these, the pilot must be sure the failure indications of the ADS-B system in the aircraft they are operating are well understood so that appropriate action can be taken.

### ***b. Air/Ground Determination***

ADS-B is required to be operational in controlled airspace and functioning from when the aircraft begins to move under its own power until it comes to a complete stop at the end of its flight.

It is important to understand how the ADS-B system operates in your aircraft and how the system determines whether you are on the ground or in the air.

Many general aviation (light) aircraft do not use a physical air/ground switch but an algorithm within the transponder to determine whether the aircraft is on the ground or in the air. These systems take inputs from GNSS and air-data provided to the transponder and, based on changes in groundspeed, altitude and various other considerations, determine when the aircraft transitions from being on ground into the air.

For these systems to accurately determine this change it is often important to have a GNSS position fix prior to taxiing the aircraft (refer to the equipment manuals for unit specific requirements). It also means that when these systems are turned on in air, either when transitioning into controlled airspace or when power to the unit is cycled, the system may incorrectly report as being on ground.

If needed, many ADS-B systems have an option to stop transmitting ADS-B data without turning the transponder off. This ensures the system retains the correct air/ground status (refer to the equipment manuals to determine this is an option on your ADS-B system).

### ***c. Non-Compliant Due to Pilot Action***

The transmission of non-compliant ADS-B data is prohibited.

The transmission of non-compliant data may be the result of several factors such as incorrect equipment selection and/or installation, as well as incorrect control of the ADS-B system by the pilot.

As stated in para. 11(a) above, the pilot should be familiar with the equipment and its manuals to avoid non-compliant data transmission within their control. As many systems are installed on an FAA STC or EASA STC it may be worth noting that the FAA refers to this non-compliance as “non-performing equipment” or “NPE”.

Examples of pilot action that may result in the transmission of non-compliant data include:

- Movement of the aircraft under its own power with the ADS-B system turned off (unless permitted to do so by ATC or otherwise);
- Operating with a non-conforming flight identification. This includes how the flight identification is entered in the system, as well as any discrepancies between what is entered and what is filed on the flight

- plan;
- Operating with barometric altitude reporting turned off (unless instructed to do so by ATC), or
- Operating the ADS-B system in ground mode whilst airborne.

**d. Flight Plan**

This section addresses pertinent flight plan information as it relates to ADS-B. For more information refer to AIP ENR 1.10.

When filing an ICAO flight plan, ensure the surveillance equipment is correctly filled out in Item 10b. The correct ADS-B capability code should reflect your aircraft capability.

- B1: ADS-B with dedicated 1090MHz ADS-B OUT capability.

As ADS-B in Fiji uses 1090MHz ES, the transponder ID should reflect the correct Mode S capability.

- EB1 or EB2 for standard Mode S ES ADS-B transponders.
- LB1 or LB2 for Mode S transponders with enhanced surveillance.

**e. Flight ID**

Operators should ensure the callsign entered into the flight plan matches the Flight ID entered into the ADS-B system.

For those operations that do not require a flight plan to be lodged, the approved callsign or registration mark (without the dash between “DQ” and the remaining characters) should be entered into the ADS-B system.

**f. Emergency/Priority Status**

The ADS-B message set includes the ability to transmit emergency/priority status codes as part of the ES ADS-B message and occurs when a valid **Mode A** emergency code is entered into the transponder. In this situation the system transmits both the **Mode A** emergency code as well as the ADS-B generated emergency status code.

The following ADS-B messages are associated with Mode A codes:

Mode A Code	ADS-B Emergency Priority Status	ADS-B Code
7500	Unlawful Interference	5
7600	No Communication	4
7700	General Emergency	1

The remaining emergency/priority status messages which are not associated with a Mode A code include:

ADS-B Emergency/Priority Status	ADS-B code
No Emergency (default)	0
Lifeguard/medical Emergency	2
Minimal Fuel	3
Downed Aircraft	6
- Reserved -	7

Refer to your equipment manual to determine if your equipment supports transmission of these messages and what conditions are required for their transmission.

12. For further information on Aircraft ADS-B requirements and approvals contact:

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13. For further information on Air Traffic Management and Procedures contact:

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