Civil Aviation Safety Authority
of Papua New Guinea

Advisory Circular

AC 91-33

Assignment of Unique Mode S Address Code

Original

30 June 2025

GENERAL

Civil Aviation Safety Authority Advisory Circulars (AC) contain information about standards, practices and procedures that the Director has found to be an **Acceptable Means of Compliance (AMC)** with the associated rule.

An AMC is not intended to be the only means of compliance with a rule, and consideration will be given to other methods of compliance that may be presented to the Director. When new standards, practices or procedures are found to be acceptable, they will be added to the appropriate Advisory Circular.

This Advisory Circular also includes **Explanatory Material (EM)** where it has been shown that further explanation is required. Explanatory Material must not be regarded as an acceptable means of compliance.

PURPOSE

This Advisory Circular provides methods, acceptable to the Director, for showing compliance with the requirements of Rule 91.249(b) relating to the assignment of a unique Mode S address code for the operation of an aircraft equipped with Mode S transponder equipment.

RELATED CAR

This AC relates specifically to Civil Aviation Rule 91.249(b).

CHANGE NOTICE

This AC is the Original and there is no change notice.

APPROVAL

This AC has been approved for publication by the Director of Civil Aviation.

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1. Introduction

Aircraft are required to be equipped with, and operate, Mode S transponder equipment in certain segments of airspace within the USA. This is also a requirement within the European Airspace. Automatic Dependent Surveillance – Broadcast (ADS-B) also uses the Mode S transponder with extended squitter (ES) in aircraft. As ADS-B is implemented in airspace, the requirement for aircraft to be fitted with Mode S transponders will increase. Prior to operating in such airspace, the Mode S transponder equipment must be assigned a unique address code by the aircraft's State of Registry, which, for Papua New Guinea (PNG), is done by the Director of CAA (the Director).

2. EM 91.249(b) Requirement for Mode S address code

ICAO Annex 10 requires that selective surveillance and data link communications with a Secondary Surveillance Radar (SSR) Mode S equipped aircraft is established through the use of an SSR Mode S aircraft address composed of a unique combination of 24 bits, known as a unique SSR Mode S address code.

In PNG, this is reflected in rule 91.249(b) which states that aircraft with Mode S transponder equipment installed must have a unique Mode S address code assigned to it.

3. EM 91.249(b) Allocation of Mode S address code

In accordance with ICAO Annex 10 and rule 91.249(b), each aircraft needs to be is assigned a unique 24-bit SSR Mode S address code by the State of Registry. In practice, PNG- registered aircraft are assigned SSR Mode S address codes by the Director, based on the principles that:

- at any one time, no address will be assigned to more than one aircraft
- only one address shall be assigned to an aircraft, irrespective of the number of transponders on board
- the address shall not be changed, except under an exceptional circumstance, and shall not be changed in flight
- when an aircraft changes State of Registry, the previously assigned address shall be relinquished and a new address shall be assigned by the new registering authority, and
- the address serves only a technical role and is not to be used to convey other information such as aircraft performance or other operating characteristics.

Under Annex 10 Volume 1, ICAO allocates blocks of SSR Mode S addresses to each State of Registry. The first bits of the address comprise the national identification code followed by the individual address code. The length of the national identification code varies from State to State but the complete address is always 24 bits.

4. EM 91.249(b) Mode S Transponder Equipment

Part 91 Appendix A.22 (2) requires all Mode S transponder equipment to meet the requirements of FAA TSO-C112 and be capable of replying to:

- Mode 3/A interrogations with the code specified by ATC
- Intermode, and
- Mode S interrogations.

5. EM 91.249(b) Military Aircraft Mode S code

PNG Defence Force Air Transport Wing military aircraft that operate in Mode S airspace are also required to carry a PNG Mode S code. Issue of the Mode S code are managed by the PNG Defence Aviation Authority. CASA PNG has allocated a block of codes for military use.

6. Mode S code for ground vehicles - Reserved

With the introduction of Multi-Lateration (MLAT) surface surveillance to support low visibility operations at major airports, some ground vehicles at PNG airports may require Mode S transponders to be fitted to enter the manoeuvring area. These vehicles are assigned Mode S codes to ensure compatibility with the system. CASA PNG will allocate a block of codes for ground vehicle use, and these are individually assigned and managed by the operator of the vehicles. Blocks of codes may be allocated to Niusky Pacific Ltd (NSPL) and National Airports Corporation (NAC) on request.

7. Uncrewed Aerial Vehicles (UAVs) or RPAS

For UAVs or RPAS to operate within controlled airspace or shared airspace, strict controls need to be put in place to manage any risks arising from the operation proposed. The operator's approach to managing any risk of operating within controlled or shared airspace will be assessed through the operator's Part 102 certification process. This assessment will also consider whether it is appropriate to permit the RPAS/UAV's nature of operation within controlled or shared airspace. CASA RPAS Unit will determine if the risk can be appropriately managed by the operator and whether it is appropriate to issue a Mode S code, or whether some other form of electronic conspicuity, as part of a wider suite of risk management mitigations, is a better option.

Should CASA believe there is a specific safety case that warrants the use of a transponder and allocation of a Mode S code for a RPAS/UAV, this will also be considered on a case-by-case basis and managed through the Part 102 certification process.

8. EM 91.249(b) Application for Allocation of Mode S code

All Aircraft

A Mode S code is automatically generated when an aircraft is registered.

You may request the Director for a Mode S code to be assigned for your aircraft by submitting a completed Application for Mode S code assignment form CA 91-06 and paying the application fee of PGK330.00.

New Aircraft Still in Production

If you need a formal letter specifying the Mode S code, or you need the code to programme a transponder before the aircraft is able to be registered (eg. aircraft is still in production), the following needs to be provided to the Director:

1. The PNG operator must provide an application for registration of aircraft on form CA 47-01 and application for Mode S code assignment form CA 91-06; and
2. A letter from the original equipment manufacturer (OEM) responsible for the aircraft that is still in production, requesting the Director to assign a Mode S code so they can programme a transponder to be fitted to an aircraft in production; and
3. The OEM must assure the Director that the assigned Mode S code will be used to programme a transponder that will only be fitted to an aircraft in production intended to be, PNG-registered.

Aircraft that are not, or not intended to be, PNG-registered, cannot be allocated a Mode S code by the Director.