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Operations Advice Notice

No. 01/25 **11th February 2025**

Transponders for Gliders and Controlled Airspace

Purpose: The purpose of this advisory is to update Gliding Australia (GAus) members of the ongoing negotiations with CASA on access to Controlled Airspace and especially referencing Transponders. Not all pilots fly or intend to fly in controlled airspace. If you do wish to fly in controlled airspace please read this OAN.

Current Situation: Gliders in Australia are currently allowed access to: Class G, Class E, Class D airspace without transponders. The current Civil Aviation Order 95.4 (Exemptions from CAR and CASR — Sailplanes and Towing Aircraft) Instrument 2024, allows gliders to fly in Class E and Class G above FL10 without Transponders. Class A is not accessible via VFR aircraft. CASA 32/22 – Use of Class A Airspace by Sailplanes Instrument 2022 has been withdrawn. See OD 02/2024.

The upcoming CASR Part 103 Manual of Standards (in development) may place conditions where transponders may be required in certain classes of airspace. GAus is a member of the CASA Part 103 Technical Working Group (TWG). The other sports aviation bodies have members attending as well.

Lastly, there are government funded rebates available at the time of writing. The end date for the rebate is 31st May 2027. The details are available at this link: ADS-B Rebate Scheme

Electronic Conspicuity

CASA states at this link : “An electronic conspicuity (EC) device is a low cost way to have both an ADS-B OUT and ADS-B IN capability. EC devices are intended for air-to-air situational awareness in non-controlled airspace. You can use an EC device in a non-certified aircraft. Air traffic control cannot use information from EC devices. This means you cannot use an EC device to meet a transponder or surveillance requirement for operations in a particular class of airspace. Aircraft with ADS-B IN can detect aircraft equipped with EC devices.”

This means a device like SkyEcho cannot be used for access to airspace where a transponder readable by Airservices is required.

Transponders for Controlled Airspace

Most new gliders entering Australia are coming equipped with transponders. A quick poll is showing a preference to Trig equipment. Other equipment being used is Becker and Microair. It is not GAus intention to recommend a particular manufacturer or model. Our glider colleagues in New Zealand are ahead of us in Australia. They have produced Advisory Circular AC 3-19 Installation of Trig TT2x/TN-72 Stand-alone ADS-B systems in Gliders. AC 3-19 can be obtained from this link.

CASA has produced an Advisory Circular AC 91-23 v1.1 ADS-B for enhancing situational awareness. This document states: “Mode A/C transponders are obsolete technology that have been replaced or are in the process of being replaced in most parts of the world by Mode S transponder technology.”

Further, it is now prohibited to fit a Mode A/C transponder to any Australian registered aircraft. The transponder must be a Mode S type.

A quick primer on Transponders

When purchasing a transponder you will be faced with an array of terms. Depending on what class of airspace you are going to operate in the transponder characteristics can vary. For example, gliders wishing to enter Class A airspace in the Bunyan, Grampians or Stirling Ranges locations which may become available in the future will require Mode S.

A transponder is a device that encompasses any of the technologies outlined below.

Summary

- Mode A/C Transponders: Basic functionality with Mode C adding altitude reporting.
- Mode S Transponders: Enhanced capabilities with unique addressing, more detailed data, and TCAS support.
- ADS-B Transponders: Advanced features with automatic transmission of detailed positional data (ADS-B Out) and reception of traffic and additional information (ADS-B In).
- Mode S with ADS-B Transponders (Mode S with extended squitter): Advanced features with automatic transmission of detailed positional data (ADS-B Out), some models also have the capacity and reception of traffic and additional information (ADS-B In).
- When combined ADS-B In/Out and Flarm units tailored for use for gliders become available, they will need to be integrated with a suitable Mode S transponder.
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Mode A:

- Identification: These transponders provide a four-digit identification code (squawk code) that air traffic controllers use to identify the aircraft on their radar screens.
- No Altitude Reporting: Mode A transponders do not report altitude information, only position.

Mode C:

- Identification: Like Mode A, they provide a four-digit identification code.
- Altitude Reporting: Mode C transponders include altitude reporting capability. They transmit the aircraft's pressure altitude to air traffic control, enhancing situational awareness and collision avoidance.

Mode S

- Selective Addressing: Mode S (Selective) transponders provide unique 24-bit addresses to each aircraft, allowing for more precise identification and communication.
- Enhanced Data: They transmit more detailed information than Mode A/C, including aircraft identification, altitude, and potentially other parameters like position, track and velocity.
- Traffic Collision Avoidance System (TCAS): Mode S transponders support TCAS functionality, which helps in detecting and avoiding potential mid-air collisions.
- ADS-B Support: Many Mode S transponders support Automatic Dependent Surveillance-Broadcast (ADS-B) Out, a technology that provides real-time positional data to air traffic control and other aircraft.

ADS-B Out:

- Automatic Transmission: ADS-B Out transponders automatically transmit the aircraft’s GPS position, velocity, altitude, track and other data to ground stations and other aircraft.

- Enhanced Situational Awareness: This capability significantly enhances situational awareness for both air traffic controllers and pilots, contributing to safer and more efficient flight operations.

ADS-B In:

- Data Reception: ADS-B In transponders receive data from other ADS-B Out equipped aircraft, providing pilots with real-time traffic information in the cockpit.
- Weather and Flight Information: In some regions, ADS-B In can also receive weather data and flight information services, further enhancing situational awareness and decision-making.

Comparison of Key Features

Feature	Mode A	Mode C	Mode S	ADS-B Out	ADS-B In
Identification Code	Y	Y	Y	Y	Y
Altitude Reporting	N	Y	Y	Y	Y
Unique Address	N	N	Y	Y	Y
Enhanced Data	N	N	Y	Y	Y
TCAS Support	N	N	Y	Y	Y
ADS-B Support	N	N	Optional	Y	Y
Real-Time Traffic Info	N	N	Optional	Y	Y
Weather/Flight Info	N	N	N	N	Y

Components of transponders

A Mode S transponder requires: GPS position source, altitude encoder, Mode A/C and S and ADSB support (Optional). These components can be in separate modules, or they may be integrated in one unit.

As you can see traversing this landscape is difficult. Airservices Australia has produced a FAQ that may assist as well. To understand this space better GAus has Airfield, Airspace and Avionics Officers for each state. You can find the Contact details for your Officer at Contact Us. Careful consultations with manufacturers and Australian agents is recommended prior to any purchase.

Who can install and test Transponders?

Transponders must be tested every 24 months. LAMEs holding a CASA Part 66 B2 (Avionics) License with the necessary endorsements are authorised to test and install transponders. CASA Certified Part 145 Approved Maintenance Organisations typically have specialised equipment for Mode A/C/S and ADS-B verification.

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