New standards for Automatic Dependent Surveillance – Broadcast (ADS-B) equipment for VFR aircraft – (CD 1905AS)

Overview

***Amendments to:***  *Civil Aviation Order 20.18 and* *instrument no. CASA 61/14*

CASA is proposing to amend the standards and requirements for Automatic Dependent Surveillance - Broadcast (ADS-B) technology used in aircraft operated under the visual flight rules (VFR).

The proposal would expand the existing standards to permit the use of lower cost ADS-B equipment that could, on a voluntary basis, be used in VFR aircraft - primarily to enhance situation awareness and therefore improve flight safety.

For Australian aircraft, ADS-B standards and requirements are specified in Civil Aviation Order (CAO) 20.18; and for foreign-registered aircraft engaged in private operations - instrument no. CASA 61/14.

Since 2017, all aircraft operating under the instrument flight rule (IFR) in Australia are required to carry ADS-B transmitting equipment (ADS-B OUT). This means many Australian aircraft in flight now transmit ADS-B position messages at regular intervals.

If the aircraft is also equipped with ADS-B receiving equipment (ADS-B IN), these position messages can be utilised to improve pilot situation awareness in any aircraft (VFR or IFR).

The CAO 20.18 IFR ADS-B OUT standards equally apply to VFR aircraft - both type certificated and non-type certificated. In other words, currently VFR aircraft can only use IFR-quality certified ADS-B OUT equipment in Australia. The CAO does not currently allow other types or forms of ADS-B OUT equipment, such as equipment that is technically capable, but not specifically authorised in accordance with a Technical Standard Order (TSO) (often referred to as 'non-TSO'd equipment).

The uptake of ADS-B OUT equipped VFR aircraft is low, with cost understood to be a significant factor. The cost factor was identified by respondents to Discussion Paper (DP) 1701 AS – Voluntary fitment of ADS-B technology in VFR aircraft – published on the Consultation Hub 15 December 2017 - 23 February 2018.

This consultation aims to address the cost factor and thereby encourage voluntary fitment of ADS-B technology within the VFR community by specifying additional technical standards for ADS-B equipment. These standards would allow:

* for certain types of aircraft, ADS-B equipment that is technically compliant with, but not formally authorised, to the relevant standard (in this document - ‘non-TSO’ equipment)
* for VFR operations in non-controlled airspace, equipment of a standard suitable for situation awareness and not necessarily suitable for ATC surveillance and separation.

This will enable operators of VFR aircraft (and airspace users generally) to use ADS-B equipment currently available at lower cost than the current IFR standards allow.

Also underway is a separate CASA project to introduce Part 43 of Civil Aviation Safety Regulations 1998 (CASR). This Part will help reduce the complexity of maintenance for general aviation aircraft and in some cases reduce the installation costs for aircraft equipment like ADS-B.

These two measures would support an increased level of ADS-B OUT fitment in VFR aircraft, and thereby maximise the potential of ADS-B technology to enhance aviation safety, by enhancing situation awareness especially in regional areas and in non-controlled airspace.

**Please note:** None of these proposals imply any mandatory requirement to install ADS-B in VFR aircraft. All proposals are for voluntary application.

### Previous consultations

**Discussion Paper 1701AS**

CASA published a discussion paper (DP) 1701AS — Voluntary fitment of ADS-B technology in VFR aircraft — on the CASA website from 15 December 2017 to 23 February 2018.

The DP explored potential options for increasing the voluntary fitment rate of ADS-B across Australia's fleet of aircraft that operate under the VFR. These options included reducing the cost of installing equipment, allowing equipment that meets technical standards but without formal authorisation, allowing equipment meeting a lower cost Traffic Awareness Beacon System (TABS) technical standard, and developing Australian Technical Standards Orders for lower cost ADS-B equipment.

CASA received a total of 80 submissions from pilots, aircraft owners, flying associations, maintenance organisations, and an air traffic service provider. 61 respondents consented to have their comments published on the CASA website. Nearly half the respondents (48%) said the proposals were a positive incentive to install ADS-B equipment in their aircraft. Seventy-three percent said that 1090MHz ADS-B equipment (as opposed to other types of ADS-B equipment - e.g. Universal Access Transceiver (UAT)) would be the appropriate technology for fitment in VFR aircraft. Seventy-eight percent agreed that the proposal would be an appropriate cost saving measure.

Based on the positive feedback, CASA informed industry that it intended to proceed with formal rule making at the earliest opportunity.

**CASR Part 91 – General Operating and Flight Rules – where it applies to aircraft transponders and surveillance equipment**

In mid-2018, CASA consulted on the provisions allowing non-TSO'd, but functionally equivalent, transponder and surveillance equipment in light sport aircraft (LSA) and aircraft with an experimental certificate.

This aspect was part of the broad consultation on proposed Part 91 of CASR and the Part 91 Manual of Standards (MOS) for general operating and flight rules. Specifically, section 30.88 of the consulted MOS covered the transponder and surveillance equipment provisions for LSA and aircraft with an experimental certificate.

At the conclusion of consultation, CASA announced that it would make Part 91 of CASR and the MOS with certain changes but not affecting Section 30.88 of the MOS. The commencement date for the new Part is March 2021.

### Documents for review

A copy of the Summary of Proposed Change and other documents related to this consultation are provided below in the ‘Related’ section. This includes a downloadable Word copy and PDF of this consultation for ease of distribution and feedback within your organisation. Please use the on-line consultation form for your response. The word document and PDF should not be used as an emailed submission.

The Summary of Proposed Policy CD 1905AS, comprises five parts:

* Summary of proposed change on CD 1905AS
* Annex A — Draft Civil Aviation Order 20.18 Amendment Instrument 2019 (No. 1)
* Annex B — Tabular comparison between the current Mode S transponder and ADS-B requirements and proposed changes within CAO 20.18 969.
* Annex C — Table describing usage scenarios for different ADS-B options
* Annex D — Table comparing technical and performance differences between the various ADS-B options

Why we are consulting

This consultation is seeking feedback on the proposed standards and requirements for ADS-B technology for aircraft operated under the VFR.

**General comments and file upload option**

There is a general comments box at the end of the consultation. You can add your comments on matters related to the regulatory amendment, which have not already been addressed in the consultation.

Comments on the proposal should be submitted through the online response form.

*Note: CASA can no longer offer the option to upload files because of the potential risk of malware.*

**What happens next**

Once the consultation has closed, we will register and review each submission received through the online response form. We will make all submissions publicly available on the Consultation Hub, unless you request that your submission remain confidential. We will also publish a Summary of Consultation which summarises the feedback received.

**Additional information**

Information about how we consult and how to make a confidential submission is available on the **CASA website** [*<https://www.casa.gov.au/rules-and-regulations/landing-*](http://www.casa.gov.au/rules-and-regulations/landing-) *page/consultation-process>* .

To be notified of any future consultations, you can subscribe to our **consultation and rulemaking mailing list** *<https://mailinglist.casa.gov.au/?p=subscribe&id=3>*.

**Page: Contents**

This consultation is seeking feedback on the proposed standards and requirements for ADS-B technology useable for aircraft operated under the VFR and on the associated consequential or house-keeping amendments.

The survey has been designed to give you the option to provide feedback on the survey in its entirety or to provide feedback on the policy areas of interest to you.

**General comments**

The last page of this consultation is a General comments page, where you can make additional comments on the proposed changes.

*Note: CASA can no longer offer the option to upload files because of the potential risk of malware.*

We will ask you for:

* **personal information**, such as your name, any organisation you represent, and your email address
* **your consent** to publish your submission
* **your responses** to the proposed changes in the regulations
* **any comments** you may want to provide
* **demographic information** to help us understand your interest in the regulations

Our **website**[*<https://www.casa.gov.au/rules-and-regulations/landing-*](http://www.casa.gov.au/rules-and-regulations/landing-) *page/consultation-process>*  contains more information on making a submission and what we do with your feedback.

# Page 1: Personal information

## First name

(Required)

|  |
| --- |
|  |

## Last name

(Required)

|  |
| --- |
|  |

## Email address

If you enter your email address, you will automatically receive an acknowledgement email when you submit your response.

## Email

|  |
| --- |
|  |

## Do your views officially represent those of an organisation?

(Required)

*Please select only one item*

Yes, I am authorised to submit feedback on behalf of an organisation

No, these are my personal views

## If yes, please specify the name of your organisation.

|  |
| --- |
|  |

Demographic question where applicable

Which of the following best describes the group you represent?

*Please select only one item*

Aircraft owner/operator

Pilot

Flying organisation

Air traffic service provider

Other

Please specify if you have selected “Other”.

|  |
| --- |
|  |

# Page 2: Consent to publish submission

In order to promote debate and transparency, we intend to publish all responses to this consultation. This may include both detailed responses/submissions in full and aggregated data drawn from the responses received.

Where you consent to publication, we will include:

* **your last name**, if the submission is made by you as an individual
* **the name of the organisation** on whose behalf the submission has been made
* **your responses and comments**

We **will not** include any other personal or demographic information in a published response.

Information about how we consult and how to make a confidential submission is available on the **CASA website** [*<https://www.casa.gov.au/rules-and-regulations/landing-*](http://www.casa.gov.au/rules-and-regulations/landing-) *page/consultation-process>* .

## Do you give permission for your response to be published?

(Required)

*Please select only one item*

Yes - I give permission for my response/submission to be published.

No - I would like my response/submission to remain confidential but understand that de-identified aggregate data may be published.

I am a CASA officer.

# Page 3: Proposal 1 – Mode S transponder with Class B TABS position source device

**CASA proposes the ADS-B OUT functionality of a Mode S transponder connected to a Class B Traffic Awareness Beacon System (TABS) position source device.**

Key points

* Class B TABS position source device is a category of lower cost global navigation satellite system (GNSS) position source.
* A Mode S Transponder with extended squitter capability would be required.
* Intended for operations where all the following apply:
  + VFR flight below FL290
  + The aircraft has a maximum certificated take-off weight of no more than 5,700kg
  + The aircraft has a maximum cruising speed not exceeding 250kt
  + The aircraft is not used for RPT or charter operations.
* System capability/airspace access depends on capability of the Class B TABS
  + lower end Class B TABS useable for air-to-air situation awareness, but not ATC surveillance separation (potentially impacting on access to surveillance control airspace)
  + higher end Class B TABS potentially allows similar airspace access to IFR standard ADS-B.
* Authoritative technical standards and requirements will be specified in section 9B and Appendix XII of CAO 20.18 (see the draft instrument included with this consultation for details).

**Fact Bank 1** – Detailed explanation of Proposal no. 1 – Class B TABS position source with Mode S transponder (Contained in online Consultation – CD 1905AS)

**Question:** Do you agree with Proposal 1 – Mode S transponder with Class B TABS position source device?

*Radio buttons*

Agree

Agree with changes (please specify suggested changes below)

Disagree (please set out your reasoning and alternative suggestions below)

Undecided / Not my area of expertise

Comments

|  |
| --- |
|  |

# Page 4: Proposal 2 – Integrated TABS device

**CASA proposes** **the ADS-B OUT functionality of an integrated TABS device for use in an aircraft conducting VFR operations.**

Key points

* An integrated TABS device is an ADS-B transmitting equipment that integrates transponder, altitude source, ADS-B OUT and Global Navigation Satellite System (GNSS) position source functionality.
* Intended for operations where all the following apply:
  + VFR flight below FL290
  + The aircraft has a maximum certificated take-off weight of no more than 5,700kg
  + The aircraft has a maximum cruising speed not exceeding 250kt
  + The aircraft is not used for RPT or charter operations.
* An integrated TABS would be useable in Class D, E & G airspace.
* An integrated TABS would be able to substitute for a Mode A/C or S transponder for VFR operations in Class E airspace, or at or above 10 000ft AMSL in Class G airspace.
* A TABS would not be able to substitute for a transponder or IFR-standard ADS-B OUT equipment for operations in Class A or Class C (radar surveillance) airspace.
* Authoritative technical standards and requirements would be specified in section 9B and Appendix XIII of CAO 20.18 (see the draft instrument included with this consultation for details).

**Fact Bank 2** – Detailed explanation of Proposal no. 2 – integrated TABS device (Contained in online Consultation – CD 1905AS)

**Question:** Do you agree with Proposal 2 – integrated TABS device?

*Radio buttons*

Agree

Agree with changes (please specify suggested changes below)

Disagree (please set out your reasoning and alternative suggestions below)

Undecided / Not my area of expertise

Comments

|  |
| --- |
|  |

# Page 5: Proposal 3 – Electronic Conspicuity (EC) device

**CASA proposes an EC device for use in an aircraft conducting VFR operations.**

Key points

* An EC device includes ADS-B transmitting functionality and can include ADS-B receiver functionality.
* An EC device would be limited to VFR operations below FL290.
* An EC device would be able to be operated in the transmitting mode concurrently with the aircraft's Mode A/C or S transponder:
  + but not if the Mode S transponder is transmitting ADS-B.
* An EC transmitting would not be able to substitute for a transponder, where the aircraft operation requires a transponder:
  + for example, VFR operation in Class C & E airspace and above 10 000 ft AMSL in Class G airspace.
* EC devices would be useable in Australian airspace only if CASA or a National Aviation Authority considers the device has a valid declaration of capability and conformance with the technical standards:
  + CASA would list such devices on its website.
* Authoritative technical standards and requirements would be specified in section 9B and Appendix XIV of CAO 20.18 (see the draft instrument included with this consultation for details).

**Fact Bank 3** – Detailed explanation of Proposal 3 – Electronic Conspicuity (EC) device (Contained in online Consultation – CD 1905AS)

**Question:** Do you agree with Proposal 3 – Electronic Conspicuity (EC) device?

*Radio buttons*

Agree

Agree with changes (please specify suggested changes below)

Disagree (please set out your reasoning and alternative suggestions below)

Undecided / Not my area of expertise

Comments

|  |
| --- |
|  |

# Page 5: Proposal 4 – Fast-track the ability to use technically capable, but not formally authorised, transponder and ADS-B equipment in certain aircraft

Key points

* CASA proposes to allow technically capable, but not formally authorised (‘*non-TSO’d*’) transponder and ADS-B equipment in:
  + a light sport aircraft (LSA)
  + an aircraft with an experimental certificate, including amateur-built category aircraft accepted under an ABAA
  + aircraft to which certain '95-series' Civil Aviation Orders apply.
* CASA originally proposed to introduce similar rules when Part 91 of CASR comes into effect in 2021.
* CASA is now proposing to fast track the implementation, but with an expanded range of eligible aircraft.
* Non-TSO'd equipment would be useable wherever equivalent, but authorised transponder or ADS-B equipment is permitted.
* The pilot or the operator using such equipment would need to have a statement of conformance (however described) from the equipment manufacturer stating the particular standard or standards of the TSO or European Technical Standard Order (ETSO) with which the equipment conforms.
* Use of non-TSO'd transponder or ADS-B equipment will not overcome or override any other requirements for access to controlled airspace:
  + for example, there is no change to the requirement for a Controlled Airspace Endorsement if the holder of a recreational pilot licence wishes to enter or operate in controlled airspace.

**Fact Bank 4** – Extract from various parts of the proposed CAO 20.18 amendment detailing the non-TSO’d provisions (Contained in online Consultation – CD 1905AS)

**Question:** Do you agree with Proposal 4 – Technically capable, but not formally authorised, transponder and ADS-B equipment in certain aircraft?

*Radio buttons*

Agree

Agree with changes (please specify suggested changes below)

Disagree (please set out your reasoning and alternative suggestions below)

Undecided / Not my area of expertise

Comments

|  |
| --- |
|  |

# Page 6: Proposal 5 – Amend the existing VFR transponder requirements

**CASA proposes to update the existing VFR transponder standards to reflect current Aeronautical Information Publication practice and to enable key ADS-B proposals under this consultation.**

Key points

* Instrument CASA 316/98 sets the requirement for an aircraft to carry a Mode A/C transponder for VFR operations:
  + within Radar coverage within Class A, B or C airspaces

or

* + when the aircraft is capable of powering a transponder — for operations in Class E airspace.
* This instrument does not reflect contemporary requirements, including the CAO 20.18 requirement for:
  + a Mode S transponder, in certain circumstances to be fitted instead of a Mode A/C transponder

or

* + ADS-B transmitting equipment to be fitted for any operation at or above FL290.
* Further, the instrument also does not reflect the longstanding (at least since 2003) practice requiring aircraft capable of powering a transponder to be fitted with a transponder when operating at or above 10 000 ft AMSL in Class G airspace. The practice is reflected as a general Mode S transponder requirement within CAO 20.18.
* Importantly, instrument CASA 316/98 inhibits the proposal to allow an integrated TABS device to be used in lieu of a transponder within Class E and Class G airspace.
* To address these issues, CASA proposes to incorporate the provisions of instrument CASA 316/98 as a new Section 9BA in CAO 20.18, but with amendments to address the issues mentioned above.
* Changes do not impose new transponder requirements.

**Fact Bank 5** – Tabular comparison of instrument CASA 316/98 and its proposed replacement section within CAO 20.18 (Contained in online Consultation – CD 1905AS)

**Question:** Do you agree with Proposal 5 – Technically capable, but not formally authorised, transponder and ADS-B equipment in certain aircraft?

*Radio buttons*

Agree

Agree with changes (please specify suggested changes below)

Disagree (please set out your reasoning and alternative suggestions below)

Undecided / Not my area of expertise

Comments

|  |
| --- |
|  |

# Page 7: Proposal 6 – Consequential or housekeeping amendments to CAO 20.18

**CAO 20.18 will require amendment to ensure the proposed standards will be properly integrated with the Order. CASA also proposes to update the CAO to remove expired implementation dates and to recognise ADS-B technical standards introduced in other parts of the world.**

Key points

* Definitions in Section 9B (*Directions relating to carriage and use of automatic dependent surveillance – broadcast equipment*) would be amended.
* Section 9B.8 thru 9B.11 (originally a series of trigger dates for ADS-B equipage) would be consolidated as one equipage requirement applicable to IFR aircraft and aircraft operated at or above FL 290.
* Section 9C (*Standards for Mode S transponder equipment*) would be amended to incorporate the ‘non-TSO’ provisions applicable to certain aircraft (see proposal 4).
* Section 9E (Carriage of Mode S transponder equipment) would be amended to account for the alternate equipment provisions in proposals 1 to 3, and to omit an expired implementation date.
* Appendix XI, which contains the standards of IFR capable ADS-B transmitting equipment would be amended to:
  + account for the alternate equipment provisions in proposals 1 to 3
  + recognise ADS-B technical standards introduced in other parts of the world as being suitable for use in Australia where carriage of ADS-B is required.

**Fact Bank 6** – Tabular comparison of the current requirements and proposed changes within Section 9B of CAO 20.18 (Contained in online Consultation – CD 1905AS)

**Fact Bank 7** – Tabular comparison of the current requirements and proposed changes within Section 9C of CAO 20.18 (Contained in online Consultation – CD 1905AS)

**Fact Bank 8** – Tabular comparison of the current requirements and proposed changes within Section 9E of CAO 20.18 (Contained in online Consultation – CD 1905AS)

**Fact Bank 9** – Tabular comparison of the current requirements and proposed changes within Appendix XI of CAO 20.18 (Contained in online Consultation – CD 1905AS)

**Question:** Do you agree with Proposal 6 – Consequential or housekeeping amendments to CAO 20.18?

*Radio buttons*

Agree

Agree with changes (please specify suggested changes below)

Disagree (please set out your reasoning and alternative suggestions below)

Undecided / Not my area of expertise

Comments

|  |
| --- |
|  |

# Page 8: Proposal 7 – Update only the standards applicable to overseas registered aircraft engaged in private operations

Key points

* CAO 20.18 only applies to Australian registered aircraft.
* To make the Australian ADS-B requirements apply to foreign registered aircraft engaged in private operations, CASA issued directions and requirements equivalent to CAO 20.18 within instrument CASA 61/14.
* CASA proposes to replace instrument CASA 61/14 with a new instrument that exactly replicates the standards in CAO 20.18 – as finally adopted.
* Requirements for foreign registered aircraft engaged in other classes of operation (aerial work, charter etc) are specified in the CAO 82-series.
* In 2021, all CAOs, including CAO 20.18 (as finally amended under this project) and the CAO 82-series, will be incorporated into and replaced by CASR Part 91 and other flight operations regulations. From that point, standard transponder and ADS-B equipment requirements will apply across the different classes of aircraft operation.

**Question:** Do you have any comments about CASA’s proposal to update in the short term, only the standards applicable to foreign registered aircraft engaged in private operations?

Comments

|  |
| --- |
|  |

# Page 9: General comments

## Do you have any additional comments about the proposed changes?

*(Please note, this should not include points you have already raised)*

Comments

|  |
| --- |
|  |