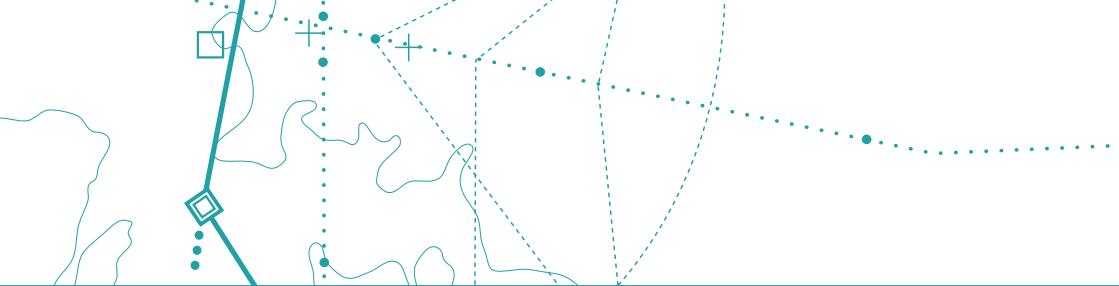




**ADS-B**  
Automatic Dependent Surveillance-Broadcast



**Australian Government**  
**Civil Aviation Safety Authority**



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This booklet is for general information only. Refer to current rules and the Aeronautical Information Publication (AIP) for full details of operational requirements.

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## WHAT IS ADS-B?

ADS-B is a broadcast surveillance system with air-to-ground (aircraft to ATIS) and air-to-air (aircraft to aircraft) applications. ADS-B avionics broadcast identification, position, altitude, velocity and other data automatically about every half second. The system 'depends' on other aircraft systems, such as a barometric encoder and global navigation satellite system (GNSS) equipment for the data.

ADS-B ground station equipment comprises a receiver unit, an antenna and a site monitor. Ground stations across Australia are connected to the Airservices Australia digital communication infrastructure, and, combined with radar, provide continent-wide, line-of-sight surveillance coverage above 30,000ft, as well as significant coverage at lower levels.

ADS-B is a data-link system that normally utilises the same transponder, but operates independently of the aircraft radar and traffic collision alerting and avoidance (TCAS) systems. Most modern Mode S secondary surveillance radar (SSR) transponders are capable of transmitting SSR and ADS-B (also termed extended squitter) data. The older Mode A/C transponders do not support ADS-B.

## BENEFITS OF ADS-B

- » Airservices' policy is to give priority to ADS-B equipped aircraft (when doing so gives an operational advantage to air traffic control [ATC])
- » Position reports by voice no longer required for identified ADS-B aircraft
- » Ability to approve continuous rather than stepped climbs and descents to and from cruising level
- » Greater flexibility in allocating appropriate flight levels at the request of pilots. (That is, to climb to optimum flight level, as aircraft weight decreases with fuel burn)
- » Airspace which previously had no radar, and only procedural separation services, can now have an ATC surveillance service
- » Greater ability for ATC to grant clearances to fly requested routes or levels
- » Aircraft are easier to locate for search and rescue (SAR)



## AIRSPACE CHANGES - ADS-B TIMELINE

Airservices Australia has deployed automatic dependent surveillance-broadcast (ADS-B) technology across Australia.

There are currently 29 duplicated ADS-B ground stations plus wide area multilateration (WAM) systems in Sydney and Tasmania that provide ADS-B data to ATC. Australia now has extensive ADS-B coverage above FL250, and reasonable coverage at 10,000 feet. Many remote locations have ADS-B to ground level including Broome, Karratha, Esperance, Longreach, Bundaberg and Bourke. Even more ADS-B ground stations are planned for deployment in the coming years.

Australia now also shares ADS-B data with Indonesia, improving efficiency and safety at the flight information region (FIR) boundary. This data is delivered on non-duplicated links and hence is not used for the support of five nautical mile separation standards. It supports situational awareness, safety nets and removal of waypoint reporting.





At the time of printing this publication (November 2012); Airservices is providing an ADS-B based separation service, mainly in, but not restricted to Class A en-route airspace, to approximately 2000 aircraft

fitted with ADS-B equipment complying with the technical standards and requirements published by CASA.

In September 2012, with knowledge and confidence of the ADS-B system well established (following an extensive trial period and ATC use of ADS-B data since late 2006), Airservices removed an existing approval procedure. Airservices now provides all aircraft transmitting valid ADS-B data with an ADS-B separation service outside of radar coverage. The only exception is for those relatively few aircraft known to have ADS-B equipment not meeting the CASA standards. Those aircraft have equipment which may be transmitting invalid position information on occasions, or not having the necessary level of integrity assurance in the transmitted information. The identity of such aircraft is included on an 'ADS-B blacklist' and the aircraft are not displayed to ATC by ADS-B means until such time this aircraft equipment complies with the required standards.

As ATC will automatically provide all aircraft transmitting valid ADS-B with an ADS-B based separation service, pilots should know that their aircraft is transmitting ADS-B, and should be familiar with ADS-B related flight planning requirements, procedures and communication phraseology.

### Combined radar and ADS-B coverage with initial ADS-B rollout

-  Existing radar coverage at 10,000ft
-  ADS-B coverage 10,000ft
-  Existing radar coverage at 30,000ft
-  ADS-B coverage at 30,000ft

### Future developments

In-trail procedure (ITP) will allow more frequent flight level changes in procedural airspace (not covered by radar or ADS-B). ITP will enable two or more aircraft, each equipped with ADS-B and cockpit display of traffic information (CDTI), to approach closer than the 50nm separation allowed in procedural airspace, but no closer than 10nm from each other.

### Dates for phased introduction of ADS-B: mandates for fitting of serviceable ADS-B

- » 12 December 2013: aircraft operating at or above flight level 290. Aircraft without ADS-B will be restricted to flight below FL290 unless specifically exempted by CASA

See page 23 of this booklet for the full timetable of ADS-B mandates for aircraft operating under IFR

#### ADS-B rule:

Civil Aviation Order 20.18 para 9B and Appendix XI [www.comlaw.gov.au/Details/F2012C00572](http://www.comlaw.gov.au/Details/F2012C00572)

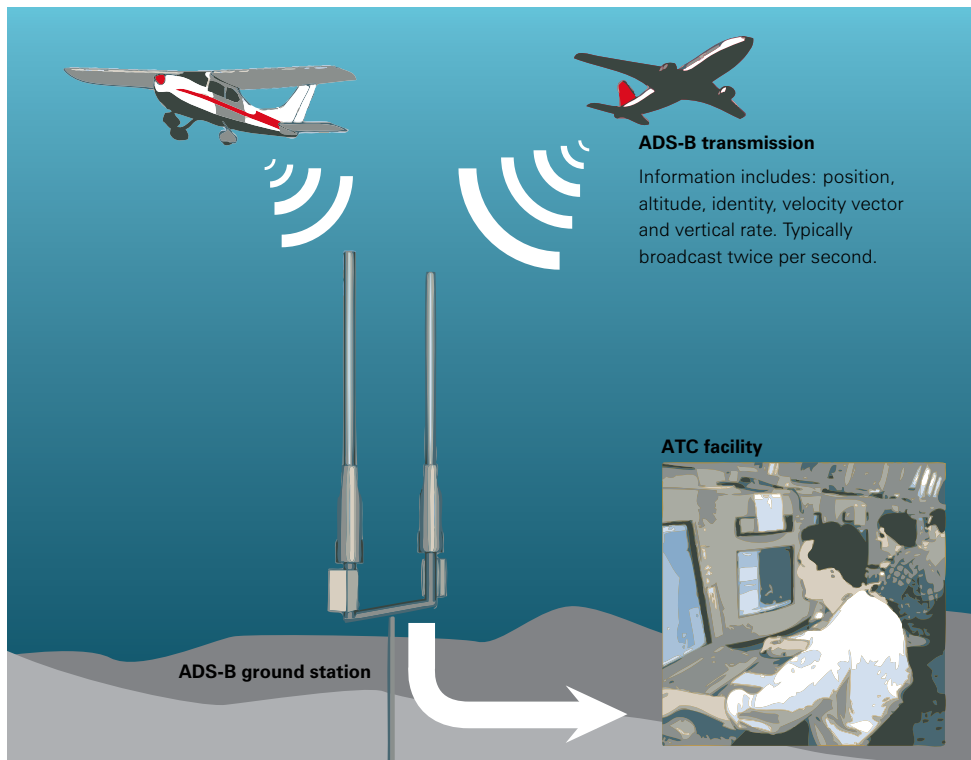


## ADS-B transmission and display

On-board ADS-B equipment can consist solely of a transmission system to send ADS-B information. Aircraft can also be equipped with a cockpit display of traffic information (CDTI), but this is not essential.

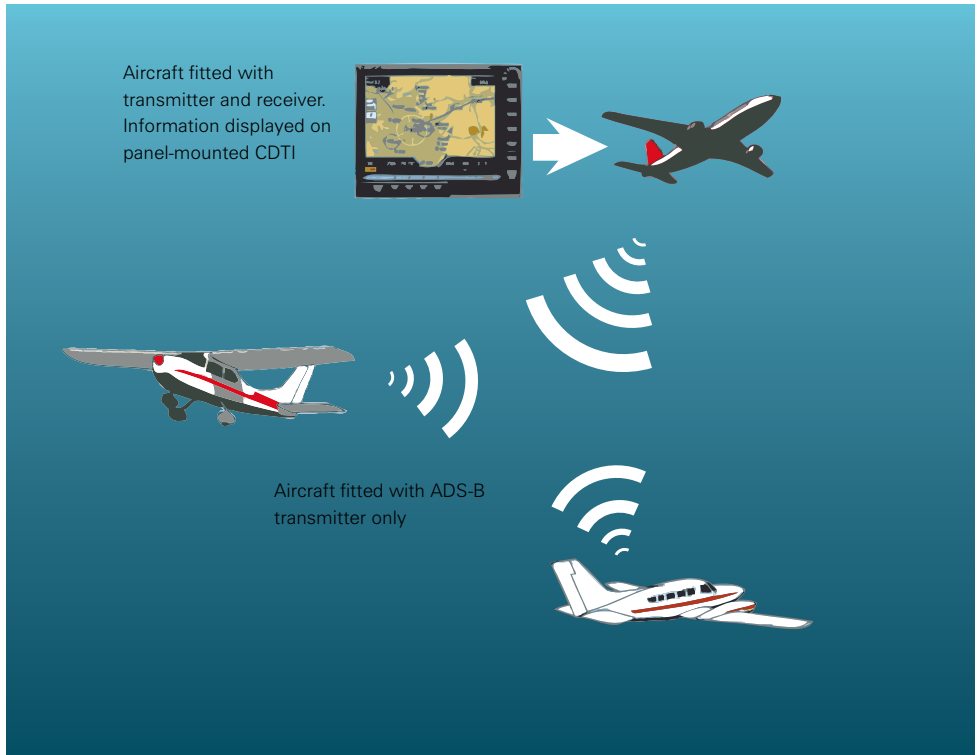
## ADS-B 'OUT'

An ADS-B transmitter enables the identity, position and altitude of an aircraft to be determined and displayed to an air traffic controller. The signal is broadcast from the aircraft approximately every half second and, provided the aircraft is within the coverage volume of an ADS-B ground station, the data can be fed to the ATC facility and used to provide air traffic services.



## ADS-B 'IN'

Aircraft may also be equipped with a CDTI and associated receiver to display the broadcast positions of ADS-B-OUT aircraft. Cockpit displays of traffic information may be combined with other systems, such as moving map navigation displays.





## AIRCRAFT EQUIPMENT

In Australia, ADS-B is transmitted on the 1090MHz extended squitter datalink, also known as 'Ten Ninety'. Standards for the extended squitter avionics are defined in Civil Aviation Order 20:18. CASA has also published Australian TSOs C1004 and C1005.

CASA may also approve equipment meeting suitable alternative standards.

**GNSS provides the positioning information for ADS-B, so if you turn the GNSS receiver off, your aircraft will become invisible to ADS-B surveillance.**

ADS-B equipment can have various pilot interfaces, ranging from a simple on/off switch for the transmitter to a pilot control interface with advanced features such as a cockpit display of traffic information.

It may also be combined with other systems, such as a secondary surveillance radar (SSR) transponder, traffic collision avoidance system (TCAS) or multifunction display (MFD).

**In most aircraft installations, the SSR transponder control module in the cockpit also controls the ADS-B transmitter; operating the SSR system will also operate the ADS-B system.**

### International variations

A number of states around the world are implementing ADS-B. Whilst harmonised as much as possible, there are some differences in equipment requirements and fitment. For example: the USA requires either DO260B (also accepted by Australia) or universal access transceiver (UAT) technology (not used in Australia).

Anyone importing a GA category aircraft from the United States should make sure the ADS-B fitted is the 1090MHz system, not the UAT system. Anyone importing an IFR aircraft from February 2014 should make sure it is ADS-B and Mode S capable.





## USING ADS-B

ADS-B systems typically broadcast two means of identifying the transmitting aircraft.

- » The first is the aircraft address (also known as the 24-bit code) and
- » the second is the flight identification (FLTID) – the visual equivalent of a call sign – used to identify targets on a display and link them to their flight plans.

### Aircraft address

Each aircraft has a unique aircraft address, which consists of a 24-bit code allocated by CASA. This code is usually entered into the unit by a LAME at installation and may be expressed in either binary or hexadecimal format. The code is on the aircraft registration letter sent to aircraft owners by CASA. If your aircraft is not registered by CASA, you can get a code from the aircraft registry (see contacts section).

### Flight identification

The aircraft identification (sometimes called the flight identification or FLTID) is the equivalent of the aircraft call sign and is used in both ADS-B and Mode S SSR technology. Up to seven characters long, it is usually set in airline aircraft by the flight crew via a cockpit interface. It enables air traffic controllers to identify an aircraft on a display and to correlate a radar or ADS-B track with the flight plan data. Aircraft identification is critical information, so enter it carefully. Punching in the wrong characters could lead to ATC confusing your aircraft with another.

It is important that the identification exactly matches the aircraft identification (ACID) entered in the flight notification. Intuitive correlation between an aircraft's identification and radio call sign enhances situational awareness and communication. Airline aircraft will use the three-letter ICAO airline code used in flight plans, not the two-letter IATA codes.





## Setting the FLTID

Your call sign normally dictates the applicable option:

- (a) the flight number using the ICAO three-letter designator for the aircraft operator if a flight number call sign is being used (e.g. QFA1 for Qantas 1, VOZ702 for Virgin 702)
- (b) the nationality and registration mark (without a hyphen) of the aircraft if the callsign is the full version of the registration (e.g. VHABC for international operations).
- (c) the registration mark alone of the aircraft if the callsign is the abbreviated version of the registration (e.g. ABC for domestic operations).
- (d) the designator corresponding to a particular call sign approved by Airservices Australia or the Australian Defence Force (e.g. SPTR3 for Firespotter 3, ROLR45 for Roller 45)
- (e) the designator corresponding to a particular call sign in accordance with the operations manual of the relevant recreational aircraft administrative organisation (e.g. G123 for Gyroplane 123).

**Don't add any leading zeros, hyphens, dashes or spaces to the FLTID.**

Sometimes an aircraft may need to use an aircraft identification and call sign other than that corresponding to the FLTID. Air traffic control may approve or direct the use of an alternative FLTID.

## Flight planning and ATC displays

In November 2012, a new flight planning format requires pilots to indicate the surveillance equipment carried and operated on the aircraft. Field 10b of the flight plan provides the following options for ADS-B equipped aircraft:

One of:

- E: Mode S transponder with FlightID, pressure altitude and extended squitter (ADS-B) capability.
- L: Mode S transponder with FlightID, pressure altitude, extended squitter (ADS-B), and enhanced surveillance capability.

And for ADS-B fitment one of:

- B1: ADS-B out using 1090MHz or
- B2: ADS-B in and out using 1090MHz

(There are also other codes for ADS-B installations complying with other international standards [e.g. UAT])

A typical field 10 b flight plan entry for an ADS-B equipped aircraft will be: (Field 10a content)/EB1.

An aircraft address code is not usually needed on flight plans. However, if ATC has approved the use of a FLTID different from the ACID, the aircraft address will be needed to correlate the flight plan to the aircraft. Enter the aircraft address in item 18 of the flight notification as hexadecimal code (e.g. CODE/7C81CB).

Hexadecimal code is complex and non-intuitive, and easy to enter incorrectly, so use it only when necessary and check it carefully.

If you lodge flight notification by radio, tell air traffic services the aircraft FLTID if it differs from the call sign.

### FLTID must exactly match aircraft in your ATS flight plan

(FPL-**ABC123**-IS ←

-B734/M-SDHIRWZ/C

-YBBN0735

-M074F360 DCT LAV H62 CORKY H39 SY DCT

-YSSY0106

-REG/VHAUS PER/B RMK/ADSB NAV/GPSRNASATPHONE)

FLTID entered in FMS/MCDU must exactly match ACID in ATS flight plan



INDICATIVE ONLY

### Common errors in FLTID entry

ABC_123 ✗ Added spaces designator omitted	ABC123 ✓	123 ✗ ICAO airline	ABC123 ✓
AB123 ✗ IATA airline designator used	ABC123 ✓	ABC0123 ✗ Additional zero inserted	ABC123 ✓
AB0123 ✗ Zero added and one letter of ICAO airline designator dropped	ABC123 ✓	BNEMEL ✗ DEP/DEST/Alternate details used instead of Flight ID	ABC123 ✓



## Flight plan procedures

Operators who meet the Australian requirements for ADS-B operations must indicate ADS-B capability in the flight notification (ATS flight plan) of all approved ADS-B equipped aircraft when planning to operate in Australian airspace.

### Example:

(FPL-ABC123-IS

-B738/M-SADE2E3FGHIRWYZ/LB1

-YSSY0905

-M077F370 DCT ENTRA Y245 BANDA  
H185 CG/NO452F360 Q69 ITIDE DCT HBA  
DCT

-YHBA0121

-PBN/A1S2T1 NAV/GPSRNAV DOF/121225  
REG/VHABC EET/YBBB0013 OPR/ABACUS  
AIRLINES PER/C RMK/TCAS)

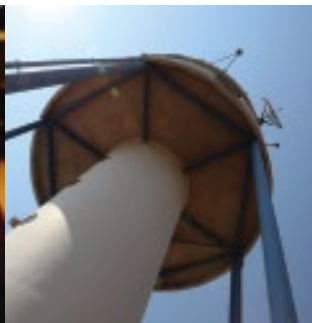


**Note:** Previous guidance material for ADS-B flight planning included a requirement to plan RMK/ADSB. The new flight plan format supersedes this, so it should no longer be included, as ADS-B fitment information is now captured in Field 10b.

**If you enter ACID or FLTID codes incorrectly, ATC might not be able to see your aircraft, or might confuse it with another. You could also affect other systems, such as TCAS. The codes are flight critical information, so enter them carefully.**

**ADS-B transmitters must not send spurious information. If ATC instructs you to stop transmitting, you must turn off your ADS-B transmitter\* and not turn it on again before it has been checked, and if necessary, repaired or reset.**

\* Many ADS-B installations share controls with the SSR transponder, so you cannot operate the two systems independently. If you cannot comply with a particular instruction, advise ATC and ask for alternative instructions.





## Correction of FLTID in flight

- » If FLTID has been entered incorrectly, ATC will instruct you to *re-enter ADS-B aircraft identification*
- » If you are able to, you must then re-set the FLTID to exactly match the aircraft identification in the ATS flight notification
- » If you are unable to re-set the FLTID in flight (e.g. FlightID configured by LAME) then advise ATC that you are *unable to comply*.

Failure to enter your FLTID correctly means information from your ATS flight plan is not automatically linked to your ADS-B information. This causes:

- » screen clutter on air traffic control displays – two different labels are displayed instead of one
- » distraction
- » increased controller and pilot workload to resolve FLTID error.

**Incorrect FLTID entry by an air transport operator is a reportable event – ATC must raise a safety incident report.**

## ADS-B performance requirements for ATC

Air traffic control use a hierarchy system on TAAATS (the Australian Advanced Air Traffic System) displays. Radar is displayed first, followed by ADS-B, followed by ADS-C and then the flight plan track of the aircraft if there is no surveillance coverage. Loss of GNSS integrity at the airborne receiver is transmitted to air traffic control in the ADS-B messages, and ADS-B services may be terminated if GNSS integrity is inadequate.



## ADS-B PHRASEOLOGY

Specific and generic radio phraseology is used for ADS-B and radar services.

Use specific phraseology when it is necessary to differentiate between radar and ADS-B.

The ADS-B equivalent of ‘squawk’ is ‘transmit’ and ADS-B is pronounced ‘ay-dee-ess-bee’ over the radio.

Otherwise, use generic phraseology when it is not necessary to differentiate between a service provided by radar and one provided by ADS-B. In many of these cases no change to existing phraseology is required. For example, ‘identified’ and the various vectoring instructions are applicable to either technology.

Consult the AIP for details of radio communication procedures and phraseology.





## ADS-B PHRASEOLOGY QUICK REFERENCE

Circumstance	Radar phraseology	ADS-B phraseology
Termination of radar and/or ADS-B service	<i>Identification terminated</i> [due (reason)] (instructions)	
Radar or ADS-B ground equipment unserviceability	<i>Secondary radar out of service</i> (appropriate information as necessary) <b>or</b> <i>Primary radar out of service</i> (appropriate information as necessary)	<i>ADS-B out of service</i> (appropriate information as necessary)
To request the aircraft's SSR or ADS-B capability	<i>Advise transponder capability</i>	<i>Advise ADS-B capability</i>
To advise the aircraft's SSR or ADS-B capability	<i>Transponder</i> (Alpha, Charlie or Sierra as shown in the flight plan) <b>or</b> <i>Negative transponder</i>	<i>ADS-B transmitter</i> (Ten Ninety datalink) <b>or</b> <i>ADS-B receiver</i> (Ten Ninety datalink) <b>or</b> <i>Negative ADS-B</i>
To request reselection of FLTID*	<i>Re-enter Mode S aircraft identification</i>	<i>Re-enter ADS-B aircraft identification</i>
To request the operation of the IDENT feature*	<i>Squawk</i> [(code)] <i>[and] Ident</i>	<i>Transmit ADS-B Ident</i>
To request termination of SSR transponder or ADS-B transmitter operation*	<i>Stop squawk</i> [ <i>transmit ADS-B only</i> ]	<i>Stop ADS-B transmission</i> [ <i>squawk (code) only</i> ]
To request transmission of pressure altitude*	<i>Squawk Charlie</i>	<i>Transmit ADS-B altitude</i>
To request termination of pressure altitude transmission due to faulty operation*	<i>Stop squawk Charlie</i> <i>Wrong indication</i>	<i>Stop ADS-B transmission</i> [ <i>(wrong indication or reason)</i> ]

\* Some older ADS-B installations may not provide for entry of FLTID, transmission of Ident, or isolation of pressure altitude by the pilot. Such systems are no longer compliant with CAOs. Some ADS-B installations may share controls with the SSR transponder, so that you cannot operate the two systems independently. If you cannot comply with a particular instruction, advise ATC and ask for other instructions.



## OPERATIONS

Before you fly with ADS-B, find out what you have to do. In most cases this will be very little, as the ADS-B broadcast is automatic. However, safe flight relies on you understanding what ATC might require of you, how to handle emergencies and how to use the cockpit interface effectively.

Air traffic control might ask you to change your FLTID, if possible, so you must know if you can do so and how. They might also ask you to stop transmitting an ADS-B signal because they have detected an error, such as altimeter failure, in your equipment. If you cannot do this, notify ATC immediately. (See the phraseology section on page opposite [page 14] for more detail on standard calls.)

**Remember: If the ADS-B transmitter and SSR transponder are combined, switching ADS-B off may also make the aircraft invisible to SSR and TCAS.**



## Emergency codes

As well as general emergency, unlawful interference and communications failure messages, ADS-B technology being developed includes a low-fuel alert and a medical emergency facility for transmitting your situation to ATC. (These capabilities will be added to the ATC system in the future.) Not all aircraft may have a pilot interface to transmit these messages.

How you notify ATC of an emergency depends on the type of equipment carried and the surveillance coverage available, so make sure you know which equipment is on board. Does the aircraft have an ADS-B emergency function? Or an on/off switch only? Is it linked to the transponder, so that squawking 7600 also sends an ADS-B communications failure message?

Does your transponder transmit discrete emergency codes, or does it transmit a generic emergency code only?

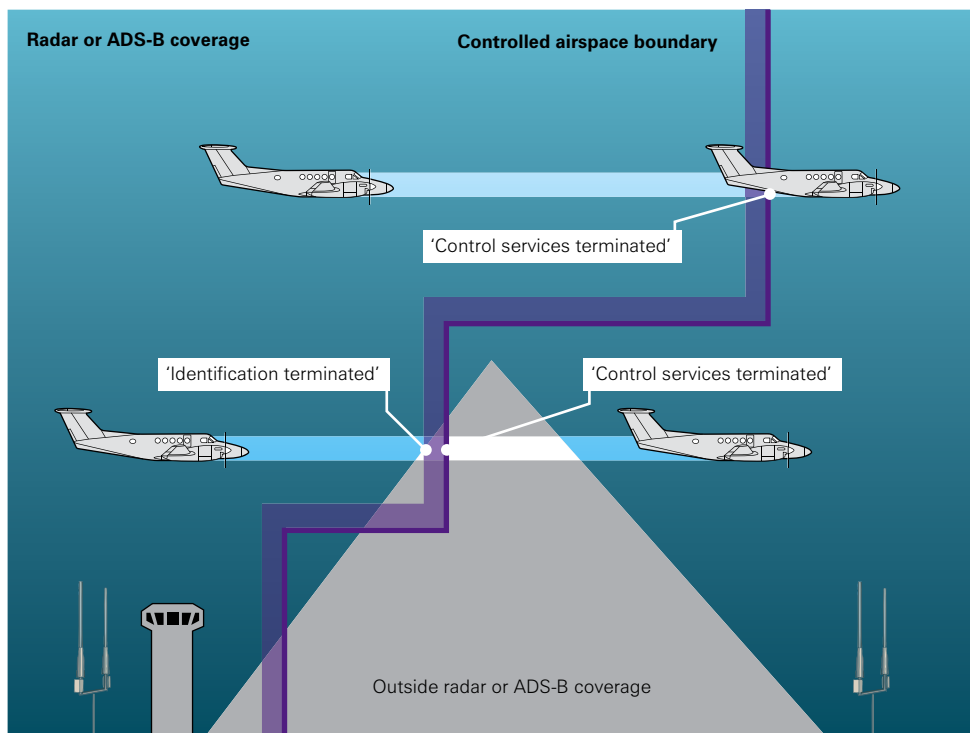
In an emergency, use all available means to signal your status, regardless of expected surveillance and communications coverage.



## Radar or ADS-B?

You may not always know which surveillance system is being used and how you are being controlled. You may be told only that you have been 'identified', but it may not be clear whether you have been identified with radar, ADS-B, or both. Unless ATC uses specific phraseology, use both ADS-B and transponder equipment to give the controller the best surveillance picture.

**Surveillance coverage and controlled airspace often have different boundaries.**

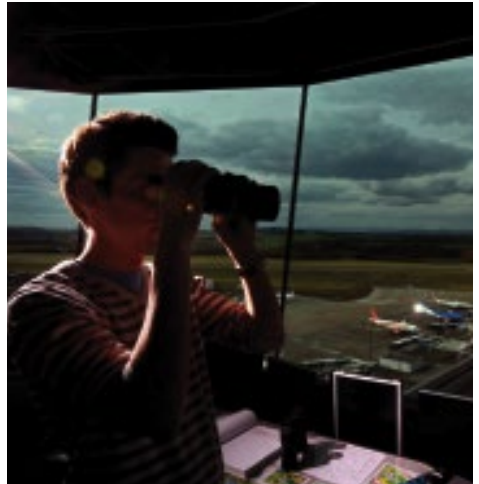


## Traffic awareness

Before flying, you must understand the capabilities of your cockpit display of traffic information (CDTI) and how to best use it for traffic awareness. CDTIs will help you spot other ADS-B traffic more easily by showing you where to look. It might not show all ADS-B traffic. That depends on the unit's filtering capability. The unit will not display non ADS-B traffic, so be aware of these limitations during use. Don't try to second-guess ATC instructions with CDTI information.

Do not attempt to take evasive action, or to separate your aircraft from other traffic, using a CDTI. It is there to enhance situational awareness, not to replace current procedures.

**Cockpit display of traffic information does not replace see-and-avoid. You still have to look out the window for other traffic.**





## HUMAN FACTORS AND ADS-B

ADS-B will see the introduction of new equipment and procedures, raising human factors issues including:

- » use of the equipment
  - operation of controls
  - understanding the information presented e.g. a CDTI
- » display readability
- » data entry
- » workload
- » human information processing and situational awareness.

### CDTI and other displays

Some aircraft may be fitted with a CDTI, although many will not. This technology will add to the training needed to become proficient in using ADS-B. The lack of standardisation of equipment might cause problems when pilots move between aircraft with different displays, as some CDTIs are more sophisticated than others. For example, some allow traffic on the ground to be filtered out.

Get to know the main differences between CDTIs in the aircraft you fly. The displays are simpler than some other avionics, but it is still possible to press the wrong key at the wrong time.

Familiarise yourself with the technology on the ground, not in the air. Concentrating on only one thing while flying can be dangerous, leading to loss of situational awareness and control. Using interactive equipment can capture your attention for longer than you think.

The same applies to an ADS-B OUT interface in the cockpit. While it will not display traffic or terrain, it will have at least an on/off switch, and some will let you enter the FLTID as well. Understand the capabilities of each interface, especially if you fly aircraft with differing units.

### Display readability

The sophistication of CDTIs varies significantly. Some units display only ADS-B information—other aircraft and their position information. Most units overlay this display on a terrain display and incorporate navigational information, providing a moving map service as well as traffic information. Range settings can affect display clutter and traffic depictions.

Terrain information might make the display seem cluttered and harder to interpret. Mount the CDTI within your primary field of view in a position easily incorporated in your instrument scan. Put the unit at a viewing distance appropriate for the size of the display and the amount of information presented.

LAMEs should consider location and distance when installing CDTIs, and ask a pilot to sit in the cockpit to review placement options.

## Data entry

Data entry applies to:

- » entering flight plans via NAIPS or other flight planning systems
- » entering data directly into the ADS-B unit on the ground by engineers
- » entering data into the unit in the cockpit by pilots.

To use ADS-B, ATC relies on the flight plan and FLTID matching in TAAATS. Ensure you have entered the correct call sign and FLTID into your flight plan. Errors could compromise ATC's ability to identify the aircraft.

The same applies to the 24-bit code normally entered by LAMEs. This is a unique ICAO identifier, issued by CASA, and any error in entering the code will create problems for ATC identification.

For example, if one digit is entered incorrectly, the ATC system could confuse your aircraft with another aircraft assigned that code. LAMEs should double check the entry.

You may have an ADS-B interface that allows you to enter FLTIDs. While many FLTIDs will remain the same, some will have to be changed. This might be needed for specific activities, such as fire spotting, or be required by ATC direction. Entering an incorrect FLTID would create a mismatch of information for ATC, so you should double check your entry.

## Workload

Automating tasks changes workloads for pilots and controllers, reducing some tasks and increasing others. For example, use of CDTI may reduce the time spent locating particular traffic, but will increase head-down time looking at the display.

ADS-B surveillance reduces the need for air-ground voice communications for position reports, cutting this part of the pilot and controller workloads. But the reduction will apply only for position reports—the ADS-B data will need to be monitored, and the mental task of tracking aircraft is still required. To maintain a listening watch, pilots with CDTIs will need to monitor both the radio and the CDTI. Balancing these tasks will create additional mental work.



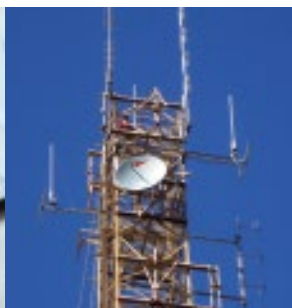
## Human information processing and situational awareness

Humans can deal with only a certain amount of information at once. In non-stressful situations, we can take in a lot about our environment. However, when the workload is heavy, as in IFR approaches, emergencies and other stressful situations, the amount of information we can process decreases. We might exceed our capacity for information processing and start to shed seemingly trivial tasks to concentrate on what we think is the most important.

That's why pilots need to be familiar with ADS-B displays and interfaces in the cockpit. If your use of them is automatic, you have a better chance of using them effectively.

While the information controllers get from ADS-B is not significantly different from that obtained from radar, operational procedures change to accommodate ADS-B technology. Controllers must understand these procedures and apply them correctly to aid information processing and situational awareness.

Pilots, meanwhile, will face different information processing challenges as the number of ADS-B transmitters and CDTI increases. CDTI monitoring will be an additional task to manage, but the greater accuracy of traffic information over radio position reports should improve situational awareness of ADS-B traffic and ultimately decrease workload. Pilots still need to use traditional traffic management techniques of radio communication and see and avoid. Once again, system familiarity and procedural compliance will help in managing workload and maintaining situational awareness.





## ARE YOU READY TO FLY?

What you need to know before you are in the air

### Background knowledge

Have you read up on:

- » the principles of operation of ADS-B?
- » how to set the FLTID?
- » the limits of ADS-B coverage?
- » radar/TCAS issues and ADS-B (e.g. turning off the transponder)?
- » display readability?
- » workload, human information processing and situational awareness limitations?
- » data entry?
- » operations and emergencies?

### Detailed knowledge

Do you know:

- » flight planning requirements for ADS-B?
- » the limitations and use of equipment on board the aircraft, including the unit's level of functionality in emergencies?
- » how to stop ADS-B transmission if ATC asks you to?
- » new radio phraseology?

For further information, see the Airservices Australia ADS-B website at [www.airservicesaustralia.com/ads-b](http://www.airservicesaustralia.com/ads-b)

**If you have covered the above areas, you are ready to use ADS-B in the air.**





## GLOSSARY

<b>ACID</b>	Aircraft identification
<b>ADS-B</b>	Automatic dependent surveillance - broadcast
<b>ADS-C</b>	Automatic dependent surveillance - contract
<b>AIP</b>	Aeronautical Information Publication
<b>ATC</b>	Air traffic control
<b>ATS</b>	Air traffic services
<b>CASA</b>	Civil Aviation Safety Authority
<b>CDTI</b>	Cockpit display of traffic information
<b>FAA</b>	Federal Aviation Administration
<b>FLTID</b>	Flight identification
<b>GNSS</b>	Global navigation satellite system
<b>IATA</b>	International Air Transport Association
<b>ICAO</b>	International Civil Aviation Organization
<b>IFR</b>	Instrument flight rules
<b>LAME</b>	Licensed aircraft maintenance engineer
<b>NAIPS</b>	National Aeronautical Information Processing System
<b>SSR</b>	Secondary surveillance radar
<b>TCAS</b>	Traffic collision alerting and avoidance system
<b>TSO</b>	Technical standard order
<b>VFR</b>	Visual flight rules





## ADS-B EQUIPMENT MANDATES

Effective date	GNSS and ADS-B equipment mandates	Status
6 June 2007	» Non-complying ADS-B must be disabled (Equipment standards & operational requirements)	CAO 20.18 - 2007
12 December 2013	» Operation at/above FL290 requires ADS-B	CAO 20.18 - 2009
6 February 2014	» New* aircraft flying IFR must be equipped for GNSS navigation and to transmit ADS-B (*placed on the Australian register on/after 6 February 2014)	CAO 20.18 September 2012
4 February 2016	» Existing* aircraft flying IFR must be equipped for GNSS navigation (*placed on the Australian register before 6 February 2014)	CAO 20.18 September 2012
6 February 2016	» Any aircraft flying IFR in classes A, C or E airspace in the area bounded by a 500nm arc north and east of Perth Airport must be equipped to transmit ADS-B	CAO 20.18 September 2012
2 February 2017	» Existing* aircraft flying IFR must be equipped to transmit ADS-B (*placed on the Australian register before 6 February 2014)	CAO 20.18 September 2012



## COMMON ADS-B INSTALLATION PROBLEMS

Over the past years the following installation faults have repeatedly occurred. It is strongly recommended that the LAME use an ADS-B capable transponder test set.

- » Incorrect setting of 'SIL' value for DO260A/B transponders – needs to be 2 (10E-5) or 3 (10E-7)
- » Incorrect Flight ID : Domestic aircraft should not include 'VH' unless on international flight leg
- » Incorrect software version in GPS or transponder
- » Incorrect Flight ID: Not the ICAO 24 bit code
- » Incorrect Flight ID 'Not 'N' as can easily be entered for a common GA transponder
- » NUC or NIC should not be 0 (which indicates the data has no integrity)

ADS-B transmissions **MUST** be disabled for non-compliant systems.



## CONTACTS

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