

## Annex C – Usage scenario descriptions for different ADS-B options

This table describes in a flight thread form the use of an ADS-B system (ADS-B OUT and IN) in a VFR aircraft, including actions by the pilot and other recipients of the information. The outcomes XXXXXX.

Scenario Description	VFR Aircraft Role or Activity	Other Aircraft Role or Activity	ATC Role or Activity	Envisaged Outcomes		
				TABS position source +Mode S Transponder	TABS Integrated	Electronic Conspicuity
<b>Before Flight:</b>						
Configure equipment.	Set Flight ID and appropriate primary and alternate 4096 code (if in-flight code setting not available).  Switch equipment to proper operating mode for flight.		None.	Capable of detection by other aircraft fitted with: <ul style="list-style-type: none"> <li>• TCAS I or II</li> <li>• Traffic awareness system (TAS)</li> <li>• ADS-B IN</li> <li>• ATC ADS-B ground stations</li> <li>• ATC radar.</li> </ul>	Capable of detection by other aircraft fitted with: <ul style="list-style-type: none"> <li>• TCAS I or II</li> <li>• TAS</li> <li>• ADS-B IN</li> <li>• ATC ADS-B ground stations, for situational awareness only.</li> </ul>	Capable of detection by other aircraft fitted with: <ul style="list-style-type: none"> <li>• ADS-B IN</li> <li>• ATC ADS-B ground stations, for situational awareness only.</li> </ul>
<b>In flight:</b>						
VFR aircraft observed on unrelated <sup>1</sup> aircraft's TCAS I or II, TAS or ADS-B IN equipment.	Respond to radio broadcasts.	Operate and monitor TCAS I or II, TAS or ADS-B IN. Respond to TA, RA or other	None.	Other aircraft fitted with TCAS I or II, TAS or ADS-B IN are alerted and aware of VFR aircraft's presence and avoids collision risk.	Other aircraft fitted with TCAS I or II, TAS or ADS-B IN are alerted and aware of VFR aircraft's presence and avoids collision risk.	Other aircraft fitted with ADS-B IN are alerted and aware of VFR aircraft's presence and avoids collision risk.
VFR aircraft (equipped with ADS-B IN) observes other ADS-B equipped aircraft.	Observe the traffic display, and/or listen to audio alerts.  Sight the traffic and take action to avoid it.	Respond to radio broadcasts.		VFR aircraft is alerted and aware of other aircraft's presence and avoids collision risk.		
VFR aircraft observed on related <sup>2</sup> aircraft's ADS-B IN equipment.	As appropriate to the type of activity <sup>3</sup> .	Monitor ADS-B IN display or aural indications.  Sight the traffic and take action to avoid it.		The related aircraft is alerted and aware of VFR aircraft's presence and avoids collision risk.		
VFR aircraft observed by ATC.	Select appropriate 4096 primary or standby code. Operate SPI function if fitted and requested.	Listen to ATC traffic information (directed or broadcast). Respond to ATC.	Observe the VFR aircraft target on console display. Read target label. Decide if target is full capability (SIL>=2)	<i>In ADS-B and radar coverage:</i> <ul style="list-style-type: none"> <li>• Alerted aircraft aware of VFR aircraft's presence</li> </ul>	<i>In ADS-B coverage:</i> Alerted aircraft aware of VFR aircraft's presence and can avoid collision risk.	<i>In ADS-B coverage:</i> Alerted aircraft aware of VFR aircraft's presence and can avoid collision risk.

<sup>1</sup> Airline, business, military, survey, medevac or IFR GA aircraft would be typical examples in this context.

<sup>2</sup> Other sport aircraft, such as other gliders, would be typical examples in this context.

<sup>3</sup> In some sport aviation operations, for example between manoeuvring gliders, radio traffic broadcasts and exchanges may not be of assistance in sighting and avoid other aircraft.

Scenario Description	VFR Aircraft Role or Activity	Other Aircraft Role or Activity	ATC Role or Activity	Envisaged Outcomes		
				TABS position source +Mode S Transponder	TABS Integrated	Electronic Conspicuity
	Listen to ATC traffic information (directed or broadcast). Respond to ATC if appropriate.	Attempt to visually sight VFR aircraft. Attempt to contact VFR aircraft by radio if appropriate.	<p>or situational awareness (SIL=1) only.</p> <p>Pass traffic information as indicated and appropriate.</p> <p>Provide warning or caution if violating (or likely to violate) controlled airspace.</p>	<p>and can avoid collision risk.</p> <ul style="list-style-type: none"> <li>VFR aircraft may avoid violating controlled airspace.</li> </ul>	<p>VFR aircraft may avoid violating controlled airspace.</p> <p><i>In radar-only coverage:</i> As above, but only if Mode C-only replies are observed.</p>	<p>VFR aircraft may avoid violating controlled airspace.</p> <p><i>In radar-only coverage:</i> None – aircraft will not be observed by ATC.</p>
VFR aircraft seeks to utilise an Air Traffic Service (control service, or flight following advisories).	<p>Select correct 4096 primary or standby code; enter discrete code if requested by ATC and supported by equipment. Operate SPI function if fitted and requested.</p> <p>Listen to ATC response, advisories and instructions. Respond to ATC as appropriate.</p>	None.	<p>Observe the VFR aircraft target on console display. Read target label. Decide if target is full capability (SIL&gt;=2) or situational awareness (SIL=1) only.</p> <p><i>SIL&gt;=2:</i> Deliver flight following or control service in accordance with existing provisions.</p> <p><i>SIL=1:</i> Use target for and/or as aid to procedural or visual separation.</p> <p><i>All Cases:</i> Provide warning or caution if violating (or likely to violate) controlled airspace.</p>	<p><i>In ADS-B and radar coverage:</i></p> <ul style="list-style-type: none"> <li>ATC delivers flight following, other advisory, or control service.</li> <li>VFR aircraft receives traffic information or separation service from other traffic (dependent on airspace class).</li> <li>Risk of collision with other aircraft reduced. Automated ATC safety nets could be activated, or ATC could detect risk<sup>4</sup></li> <li>VFR aircraft may avoid violating controlled airspace.</li> </ul>	<p><i>In ADS-B coverage:</i></p> <ul style="list-style-type: none"> <li>ATC provides procedural or visual service if possible, or declines.</li> <li>Other aircraft may be alerted to presence of VFR aircraft.</li> <li>Risk of collision with other aircraft reduced. Automated ATC safety nets could be activated, or ATC could detect risk.</li> <li>VFR aircraft may avoid violating controlled airspace.</li> </ul> <p><i>In radar coverage:</i></p> <ul style="list-style-type: none"> <li>As above, but only if Mode C replies are observed.</li> </ul>	<p><i>In ADS-B coverage:</i></p> <ul style="list-style-type: none"> <li>ATC provides procedural or visual service if possible, or declines.</li> <li>Other aircraft may be alerted to presence of VFR aircraft.</li> <li>Risk of collision with other aircraft reduced. Automated ATC safety nets could be activated, or ATC could detect risk.</li> <li>VFR aircraft may avoid violating controlled airspace.</li> </ul> <p><i>In radar coverage:</i></p> <ul style="list-style-type: none"> <li>None – aircraft will not be observed by ATC.</li> </ul>
VFR aircraft emergency.	<p>Select emergency 4096 code. Operate SPI function if fitted and requested.</p> <p>Listen for ATC assistance and traffic information (directed or broadcast). Respond to ATC as and if appropriate.</p>	<p>Listen to ATC traffic information (directed or broadcast). Respond to ATC.</p> <p>Attempt to visually sight VFR aircraft. Attempt to contact VFR aircraft by radio if appropriate.</p>	<p><i>In all observed cases:</i></p> <ul style="list-style-type: none"> <li>Observe the VFR aircraft target on console display. Read emergency target label.</li> <li>Attempt to contact pilot.</li> <li>Alert SAR and emergency services.</li> <li>Pass traffic information as indicated and appropriate.</li> </ul>	<p><i>In ADS-B and radar coverage:</i></p> <ul style="list-style-type: none"> <li>VFR aircraft emergency is communicated to ATC.</li> <li>Emergency support resources able to be engaged. Position and trajectory of aircraft and location of emergency is known.</li> </ul>	<p><i>In ADS-B coverage:</i></p> <ul style="list-style-type: none"> <li>VFR aircraft emergency is communicated to ATC, where the device is EMG capable.</li> <li>Emergency support resources able to be engaged. Position and trajectory of aircraft and location of emergency is known.</li> </ul>	<ul style="list-style-type: none"> <li>In ADS-B coverage: VFR aircraft emergency is communicated to ATC, where the device is EMG capable.</li> <li>Emergency support resources able to be engaged. Position and trajectory of aircraft and location of emergency is known.</li> </ul>

<sup>4</sup> ATC automation typically alerts for IFR to any known target. No alert for VFR to VFR/Unknown target

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				TABS position source +Mode S Transponder	TABS Integrated	Electronic Conspicuity
				<ul style="list-style-type: none"> <li>Other potentially conflicting aircraft remain clear of area.</li> <li>Emergency hazard to other aircraft and ground parties reduced.</li> </ul>	<ul style="list-style-type: none"> <li>Other potentially conflicting aircraft remain clear of area.</li> <li>Emergency hazard to other aircraft and ground parties reduced.</li> </ul> <p><i>In radar coverage:</i></p> <ul style="list-style-type: none"> <li>As above, but only if Mode C replies are observed.</li> </ul>	<ul style="list-style-type: none"> <li>Other potentially conflicting aircraft remain clear of area.</li> <li>Emergency hazard to other aircraft and ground parties reduced.</li> </ul> <p><i>In radar coverage:</i></p> <ul style="list-style-type: none"> <li>None - aircraft will not be observed by ATC.</li> </ul>
VFR aircraft search and rescue phase initiated.	Pilot of aircraft fails to cancel SARTIME, make required report, or is reported overdue.	Other aircraft may be tasked to assist per existing procedures.	<p>ATC perform communication checks and other SAR procedures.</p> <p>ATC examine recorded ADS-B data or "last detected" function on ATC screen to identify reasonable SAR area.</p>	<p><i>In ADS-B and radar coverage:</i></p> <ul style="list-style-type: none"> <li>VFR aircraft emergency is communicated to ATC.</li> <li>Emergency support resources able to be engaged. Position and trajectory of aircraft and location of emergency is known.</li> <li>Emergency hazard to other aircraft and ground parties reduced.</li> </ul>	<p><i>In ADS-B coverage:</i></p> <ul style="list-style-type: none"> <li>VFR aircraft emergency is communicated to ATC.</li> <li>Emergency support resources able to be engaged. Position and trajectory of aircraft and location of emergency is known.</li> <li>Emergency hazard to other aircraft and ground parties reduced.</li> </ul> <p><i>In radar only coverage:</i></p> <ul style="list-style-type: none"> <li>As above, but only if Mode C replies are observed.</li> </ul>	<p><i>In ADS-B coverage:</i></p> <ul style="list-style-type: none"> <li>VFR aircraft emergency is communicated to ATC.</li> <li>Emergency support resources able to be engaged. Position and trajectory of aircraft and location of emergency is known.</li> <li>Emergency hazard to other aircraft and ground parties reduced.</li> </ul> <p><i>In radar only coverage:</i></p> <ul style="list-style-type: none"> <li>None - aircraft will not be observed by ATC.</li> </ul>
VFR aircraft activities monitored by non-ATC ground station(s) including individual receivers, FlightAware, FlightRadar24 and others.	None.	None.	None.	<p>Operating companies, related business and training organisations, flying clubs, relatives and other observers view and/or record aircraft position, track, altitude and other flight details for information and/or analysis.</p> <p>(Range and performance dependent on power output of TABS and EC devices.)</p>		