

CAA publishes final decision

# SSR Transponder Carriage: the way ahead

## background to the change

For many years, Secondary Surveillance Radar (SSR) technology has been an essential component of the Air Traffic Management network enabling safe and efficient use of airspace. SSR is essential for identifying aircraft and providing height information to support traffic management procedures, conflict warning and collision avoidance. Aircraft not carrying a transponder (the aircraft equipment that sends out the position and height of the individual aircraft) cannot benefit from these safety layers. Primary radar does not provide precise aircraft altitude or identification and can have difficulties in detecting small modern aircraft of composite structure, so basic SSR has been used over the last 50 years or so to provide additional electronic visibility. This basic SSR has very limited growth capability, suffers from radio frequency interference, degraded aircraft detection and traffic capacity limitations.

A modern SSR system is essential to accommodate the growth of air traffic safely and in an environmentally sound way. In conjunction with European partners, the UK has been participating in the development and implementation of Mode S as the replacement SSR technology since the 1990s. Mode S provides additional capacity, is more efficient in its use of radio spectrum and overcomes the technical limitations of the older SSR system.

The CAA launched a public consultation in February 2008 proposing wider equipage of Mode S. Some 1,900 responses were received, the vast majority coming from sporting and recreational pilots and associations, particularly the gliding sector. These raised concerns over costs, lack of direct benefits and a perceived lack of suitable equipment for some types of aircraft.

The CAA was able to refine its proposals having given consideration to the views and concerns of stakeholders. Mode S was introduced as the means of compliance with mandatory transponder carriage from March 2008 but transition arrangements allow for continued use of Mode A/C where it is already fitted to aircraft until March 2012.

## Mode S - the decision

The following changes will therefore be introduced:

● **Regulation to require all aircraft (except gliders) flying within Class A to C controlled airspace to carry and operate a Mode S transponder with effect from 1 October 2009.** It is considered that the actual impact of this change will be negligible, as the vast majority of aircraft likely to be affected will already be suitably equipped.

Moreover, the CAA is content for ATC units to continue to provide mitigation, such as through Letters of Agreements, for non-transponder equipped flights to have access in specified circumstances where safety and efficiency issues can be managed appropriately.

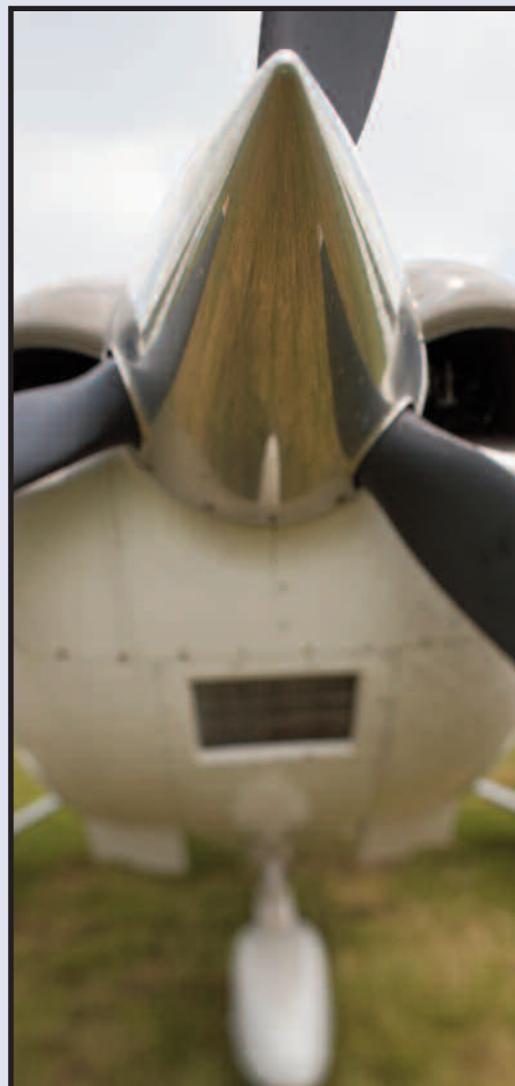


● **An extension of the transponder carriage regulations to include gliders with effect from 6 April 2012.** Alongside this proposed regulatory change, the CAA will continue to encourage the use of Letters of Agreement between gliding organisations and ATC units to permit access to airspace without transponders in specified circumstances where safety and efficiency issues can be managed appropriately. The current arrangements will continue to be applied for permitting gliding activity without transponders when operating in a designated gliding area. The CAA will also work with the gliding associations and other stakeholders to explore the feasibility of providing specific, notified areas of Class G airspace at and above FL 100 where gliders could still be allowed to operate without an SSR transponder.

● **Amendments to the SSR transponder carriage regulations applicable to Self-Launching Motor Gliders (SLMG).** As a result of information provided during the Mode S consultations, the CAA is satisfied that some SLMG operators can encounter the same challenges with SSR transponder equipage as those experienced by operators of gliders and Self-Sustaining Gliders (SSG). However, an SLMG is not currently included within the definition of 'glider' in the Air Navigation Order and so, unlike gliders, SLMG have been required to adhere to the SSR transponder carriage requirements unless otherwise authorised by a responsible ATC unit. This amendment will align the SSR transponder carriage regulations for SLMG with those applicable to all other gliders.

## Transponder Mandatory Zones (TMZ)

● **Employment of the Airspace Change Process (ACP) to further extend the SSR transponder carriage requirements in specific volumes of airspace.** The CAA is empowered to introduce additional mandatory transponder carriage requirements without formal public consultation. Where necessary to address pressing safety and efficiency needs it will continue to use these powers. In general however, it has been decided to



employ the Airspace Change Process (ACP) as the mechanism with which to process applications from external stakeholders for extensions to the transponder carriage requirements in specific volumes of Class D to G airspace on a case-by-case basis. This will include requests for the establishment of TMZs. The CAA is satisfied that use of the ACP ensures that appropriate justification has to be provided and all stakeholders fully consulted by applicants so that the impact of proposed changes can be fully assessed and suitable mitigation arrangements determined.

## what won't happen

The decision means that **there is no current requirement for all aircraft to carry Mode S transponders in all UK airspace.**

The decision is not designed to facilitate an increase in the amount of commercial air traffic or UAVs operating in Class G airspace and the measures are not linked to airspace charging or radio carriage. **Also, nothing in the announcement will lead to GA aircraft that cannot equip with Mode S transponders being grounded.** However, aircraft that are not equipped with transponders may encounter difficulty in obtaining clearance to access certain airspace.

## if I have a Mode A/C transponder should I still use it?

**Yes, definitely.** If your aircraft is fitted with a Mode A/C transponder and you are flying in airspace that does not require Mode S then, for safety reasons, you should turn on your transponder and set it to ALT. If you don't do this then you are denying ATC potentially vital safety information and also making yourself invisible to any aircraft in your vicinity that are fitted with collision avoidance systems such as TCAS.

Under existing transition arrangements associated with the previous expansion of Mode S transponder carriage in UK airspace, operators of aircraft wishing to operate in mandatory transponder carriage airspace that are equipped with Mode A/C transponders have until 31 March 2012 to complete the necessary upgrades to Mode S compliance. This alleviation will also apply to the increased Mode S transponder carriage requirements arising from these new measures. In addition, the recently notified exemption for SLMGs from the SSR transponder carriage requirements will be extended until the applicability for SLMGs in the Air Navigation Order can be aligned with that specified for gliders and SSGs.



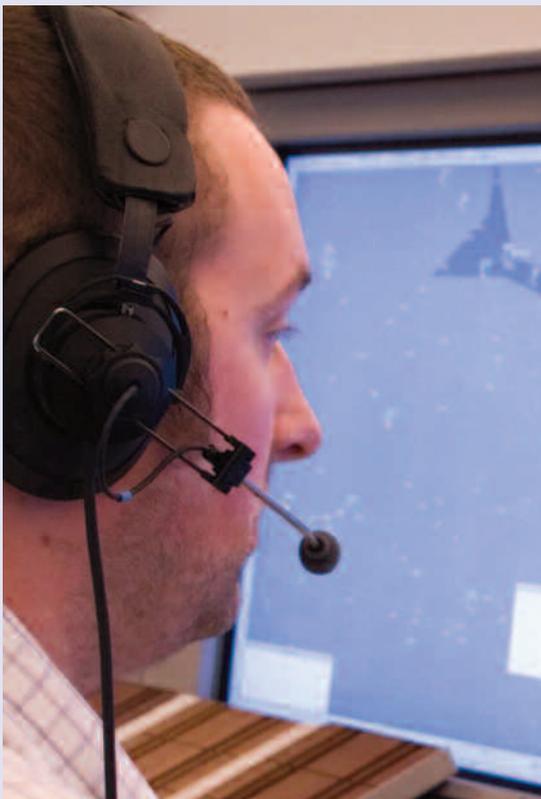
## how do I seek an exemption for my Mode A/C transponder?

If an aircraft is already equipped with a Mode A/C transponder, it may still be operated in airspace where transponders are mandatory until 31st March 2012. This transition period has been put in place to allow sufficient time for operators affected by the Mode S expansion plans to have their aircraft upgraded. It is also aligned with the implementation of Mode S in the ground-based radars and ATC systems by NATS, which is due to be completed in 2012.

Before taking advantage of this exemption, which is promulgated in an Official Record Series 4, the owner is required to inform the CAA of the aircraft's details. A form for this purpose is available on the CAA's website at [www.caa.co.uk/dap1901](http://www.caa.co.uk/dap1901). This form may be submitted online, it takes only a few seconds to complete, and is free of charge. (This exemption is not available to aircraft that have required Mode S since March 2005.)

## Mode S - the facts

- The existing Mode A/C system has served the aviation industry well but, over the last three decades, the significant increase in traffic levels within UK and European airspace has highlighted the limitations of this outdated technology and stretched the capacity and capability of the system to its limits. In particular, it is prone to interference, especially where many aircraft are operating in the same volume of airspace. Mode S overcomes these problems.



- Other technologies, such as those that use satellite positioning, are not currently compatible with SSR or collision avoidance systems such as TCAS. The CAA therefore believes that these emerging technologies will not be suitable as an alternative option in the required timescales.
- Computer modelling carried out by the CAA indicates that Mode S transponders on light aircraft will not saturate ATC systems or TCAS.
- Controllers will not 'filter out' Mode S information on their screens if they have an operational need to see it. Filtering on controller displays is an established ATC practice and it does not stop transponders being detected by TCAS or radars.
- A Health Protection Agency report has indicated to the CAA that appropriately installed Mode S transponders will not cause radiological hazards in very light aircraft.
- The Ministry of Defence has a programme to fit Mode S capable SSR transponders to its military aircraft to help protect freedom of movement and improve interoperability.

Further information on Mode S can be found on the CAA's Mode S web pages at: <http://www.caa.co.uk/modes>.

**The CAA** is the UK's independent aviation regulator, with responsibility for all civil aviation regulatory functions: economic regulation; airspace policy; safety regulation; and consumer protection.