

To:

EASA Part 21 DOA's, Transponder Manufacturers,
Aircraft OEM's, Aircraft Operators, EASA Part 145
Maintenance Organisations.

Date : 02 March 2007
Issue 2.

Subject: EASA Certification of Mode S Elementary and Enhanced Surveillance Transponder Modifications

1. Why are we writing to you?

This letter explains the European Aviation Safety Agency's (EASA) position regarding the modification and certification of aircraft required to meet the European airspace mandate for Mode S Elementary Surveillance (ELS) and Mode S Enhanced Surveillance (EHS). The introduction of Mode S will improve the quality, detection, identification and altitude reporting of aircraft within the airspace. It will also provide additional parameters for the Air Traffic Controller, which may be used to reduce workload and improve safety in the airspace. This letter provides information to all European Aircraft Operators, EASA Part 21 Design Organisations, EASA Part 145 Maintenance Organisations, Aircraft Manufacturer's and Transponder Manufacturers and is prompted following comments and certification questions raised by industry at various international forums.

This letter was updated on 2nd March 2007 to reflect the comments provided by Industry and Eurocontrol. You are requested to periodically consult the EASA website for any further updates to this letter.

2. Which aircraft are required to have Mode S EHS?

Certain European countries, including France, Germany and United Kingdom have implemented Mode S Enhanced Surveillance for Instrument Flight Rules (IFR) flights operating as General Air Traffic (GAT) in designated 'Mode S Airspace' from **31 March 2005** with a transition period, which expires on **31 March 2007**. Fixed wing aircraft with a maximum take off mass in excess of **5700 kgs** or a maximum cruising true airspeed of greater than **250kts** will require **Mode S EHS**

Note 1: Aircraft which require Mode S EHS will also require Mode S ELS.

Note 2: All other aircraft flying IFR as GAT in designated 'Mode S Airspace' will require, at least **Mode S ELS**.

Note 3: Most IFR flights, in Europe, will be conducted in Mode S designated airspace and will therefore require Mode S ELS. If you operate in a European country that does not have a Mode S airspace requirement, but you fly within a country which does have a Mode S airspace requirement then you will have to comply with country which has a Mode S airspace requirement. For details of each countries Mode S airspace policy please refer to the Eurocontrol Mode S Website
http://www.eurocontrol.int/msa/public/subsite_homepage/homepage.html

Note 4: Aircraft flying as VFR in designated Mode S airspace will require Mode S ELS from 31 March 2008 (subject to State mandates).

3. Who can modify my aircraft?

Any modification to a European (EC) registered aircraft requires the design data to be approved by EASA or a company holding an EASA Part 21 Design Organisation Approval (DOA) Note: A company holding an EASA Part 21 DOA may approve **minor** changes/modifications only. The installation of the modification may be performed by a qualified organisation (e.g. a EASA Part 145 Maintenance Organisation).

Further installations of the modification may be performed on the same aircraft type, as defined in the approved design with the permission of the approved design data holder, without recourse to EASA. For non European registered aircraft, the National Aviation Authority should approve the modification and, in order to satisfy

European Mode S requirements, compliance with EASA Mode S Guidance material is strongly recommended. See paragraph 4.

4. What are the Certification Requirements for Mode S ELS and EHS?

As there are no ‘particular’ certification specifications for Mode S ELS or Mode S EHS, the Joint Aviation Authorities (JAA) have produced two guidance documents. These documents, *JAA TGL 13 Rev 1, dated 1st June 2003* and *JAA NPA 20-12a, dated 11th February 2004* provide guidance for applicants involved in the integration, installation, certification and continued airworthiness of Mode S ELS and Mode S EHS respectively. EASA have adopted these documents and JAA TGL 13 Rev1 may still be used to demonstrate compliance with the Mode S ELS. JAA NPA 20-12a, however, is now superseded by **EASA AMC 20-13** (Acceptable Means of Compliance). Applicants are requested to use the AMC guidance material, in place of NPA 20-12a, however those applicants who demonstrated compliance with JAA NPA 20-12a, previously, will not have to show compliance with EASA AMC 20-13. Please refer to the EASA web site for a copy of AMC 20-13. http://www.easa.eu.int/home/certspecs_en.html

5. I can’t provide all the parameters required for Mode S EHS – can I apply for an Exemption?

Aircraft which cannot provide all the parameters required for Mode S EHS can apply for an exemption from Eurocontrol. Refer to the following Eurocontrol website for further information http://www.eurocontrol.int/msa/public/standard_page/modes_trans_arrange_coord_cell.html

Note 1: Aircraft which **can not** provide all EHS parameters, as defined in EASA AMC 20-13 are referred to as ‘**EHS Non Capable**’. This includes aircraft which can provide none, or only a subset of the EHS parameters, as defined in EASA AMC 20-13. To be classed as ‘EHS Non Capable’ the operator must have demonstrated compliance/non compliance with EASA AMC 20-13 via a modification/change to the aircraft and **registered their aircraft as ‘EHS Non Capable’ with Eurocontrol Mode S Exemption Cell (EEC) in order to obtain an exemption.** In most cases the modification/change will be classified as a ‘major change’ by EASA.

Note 2: Those aircraft which **can provide all** EHS parameters, as defined in EASA AMC 20-13 are referred to as ‘**EHS Compliant**’. To be classed as ‘EHS Compliant’ the operator must have demonstrated compliance with EASA AMC 20-13 via a modification/change to the aircraft and **registered their aircraft as ‘EHS Compliant’ with Eurocontrol Mode S Exemption Coordination Cell (ECC).** In most cases the modification/change will be classified as a ‘major change’ by EASA.

Note 3: Eurocontrol will only issue ‘general’ exemptions up to 31 March 2007. Certain exemptions may be possible after this date . Please refer to the Eurocontrol web site listed above for further details.

Note 4: After 31 March 2007, operators of aircraft which are required to have Mode S EHS (see paragraph 2) and are not EHS Compliant or do not have a valid exemption from Eurocontrol will need to contact Eurocontrol for further advice.

6. Common Certification Problems

6.1 Operators who applied for an Exemption because their aircraft was unable to provide one or more Mode S EHS Parameters

Some Operators applied to Eurocontrol for an Exemption because their aircraft was unable to provide a full set of Mode S EHS parameters (as required by *EASA AMC 20-13*). The Exemption, issued by Eurocontrol, acknowledges that the aircraft cannot send any, or only a subset of the required parameters. It now transpires that some of these Operators may not have complied with the guidance material for Mode S EHS, in that each aircraft operator is required to define, in the Aircraft Flight Manual (AFM) or Pilot’s Operating Handbook (POH), which Mode S EHS parameters they are transmitting to the ground and which parameters they are not transmitting to the ground. This compliance determination should be conducted by a suitably approved organisation, such as a company holding an EASA Part 21 DOA. The extent of the compliance with *EASA AMC 20-13* should be recorded as a modification to the aircraft.

For example, some Operators have declared their aircraft as a Mode S ELS aircraft, because the avionics systems do not support Mode S EHS (these aircraft are sometimes referred to as ‘analog’ aircraft). These aircraft may have a Mode S transponder installed, which is capable of Mode S ELS and EHS, but no assessment was made to determine

if any Mode S EHS parameters are also transmitted or available. In some cases these aircraft are sending Mode S EHS parameters, which have not been tested or listed in the AFM or POH.

The EHS parameters, which are available from the aircraft sensors, should be in compliance with EASA AMC 20-13 and transmitted to the ground.

Operators are therefore requested to ensure that they have a statement in the Aircraft Flight Manual (AFM) or Pilot's Operating Handbook (POH) detailing the extent of the aircrafts compliance with EASA AMC 20-13.

6.2 Aircraft which are *only* required to provide Mode S ELS (i.e aircraft less than 5700kg or having a maximum cruising true airspeed of less than 250 kts).

If a Mode S transponder, installed on an aircraft, is capable of Mode S ELS and EHS then the operator should consult a suitably approved organisation, such as a company holding an EASA Part 21 DOA to determine whether or not Mode S EHS parameters are also down-linked to the ground. If Mode S EHS parameters are also down-linked, then the extent of the compliance with *EASA AMC 20-13* should be recorded as a modification/change to the aircraft.

The requirement to record compliance with *EASA AMC 20-13* ensures that all aircraft transmitting Mode S EHS parameters are fully tested. This parameters transmitted to the ground should be recorded in the AFM or POH.

Note 1: Aircraft which are only required to provide Mode S ELS, but which can provide one or more EHS parameters are not required to seek a Mode S EHS exemption from Eurocontrol.

7. Conclusions – What should you do now

In order to ensure a smooth transition to Mode S, it is essential that all aircraft 'required' to have Mode S ELS or Mode S ELS & EHS are modified to meet the timescales referred to above. This letter explains the European Aviation Safety Agency's (EASA) position regarding the modification of aircraft to meet the European airspace requirement for Mode S ELS and EHS. Operators of aircraft, Part 21 Design Organisations, Part 145 Maintenance Organisations and Aircraft Manufacturers are requested to note the contents of this letter and act accordingly. This may result in some re-investigation into already approved Mode S modifications. If you have any further questions arising from this letter please contact the EASA Mode S Certification Team using the E-Mail below, or if you prefer, you can ring the Team on +49 221 89990 4050.

Yours faithfully,

For and behalf of EASA.

EASA Mode S Certification Team

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