

## Standard Change CS-SC057a

### 3. Acceptable methods, techniques, and practices

The following standards contain acceptable data:

- FAA Advisory Circular AC 43.13-2B, Chapters 1 and 2; and
- FAA Advisory Circular AC 43.13-1B, Chapters 10, 11 and 12, or ASTM F2639-18 or subsequent revisions.

A typical ECElectronic conspicuity (EC) function or device consists of an electronic unit (emission unit and receiving unit) with some embedded and/or external antennas. Such a function or device also includes a means to obtain the aircraft's position, such as an embedded GNSS receiver. It also broadcasts its position. Any compatible receiver in the receiving range, in the air or in the ground, can process such position. This broadcast can use an aeronautical frequency or a non-aeronautical frequency. Similarly, it can receive positions from other aircraft either on an aeronautical frequency and/or on a non-aeronautical frequency. The position of the other aircraft can be directly transmitted or received via a ground service.

*Note: An aeronautical frequency is defined as a radio frequency allocated to aeronautical services in accordance with the applicable telecommunications regulations. Technical standards for the use of such frequencies include both the telecommunications and the aviation requirements.*

Such an EC function can be combined with another system or integrated into a specific piece of hardware such as a light. In such a case, this SC may be used for the installation of the ECElectronic conspicuity (EC) function or device. The device that embeds this EC function shall be properly qualified for its purpose and shall not be affected in any way by any failure of the ECElectronic conspicuity (EC) function or device. This SC indicates the conditions in the 'embodiment' item.

The equipment manufacturer declares which elements are included in the EC function or device, their related characteristics and the external equipment to which they can be connected. The following diagram and template illustrate one means for the equipment manufacturer to provide declarations for the installation of the various elements.

*Note: An EC function or device comprises at least the following elements: a position sensor for the aircraft position and a transmitting function (transmitter with antenna). A receiver and a means to display nearby traffic are optional. In the diagram of Figure 1 below, the blue colour indicates the elements that are necessary for the EC device to operate. However, there are several possible options (in green) for each element. An element can include several options such as, for example, one receiver within the aeronautical frequency band and one receiver outside the aeronautical frequency band.*

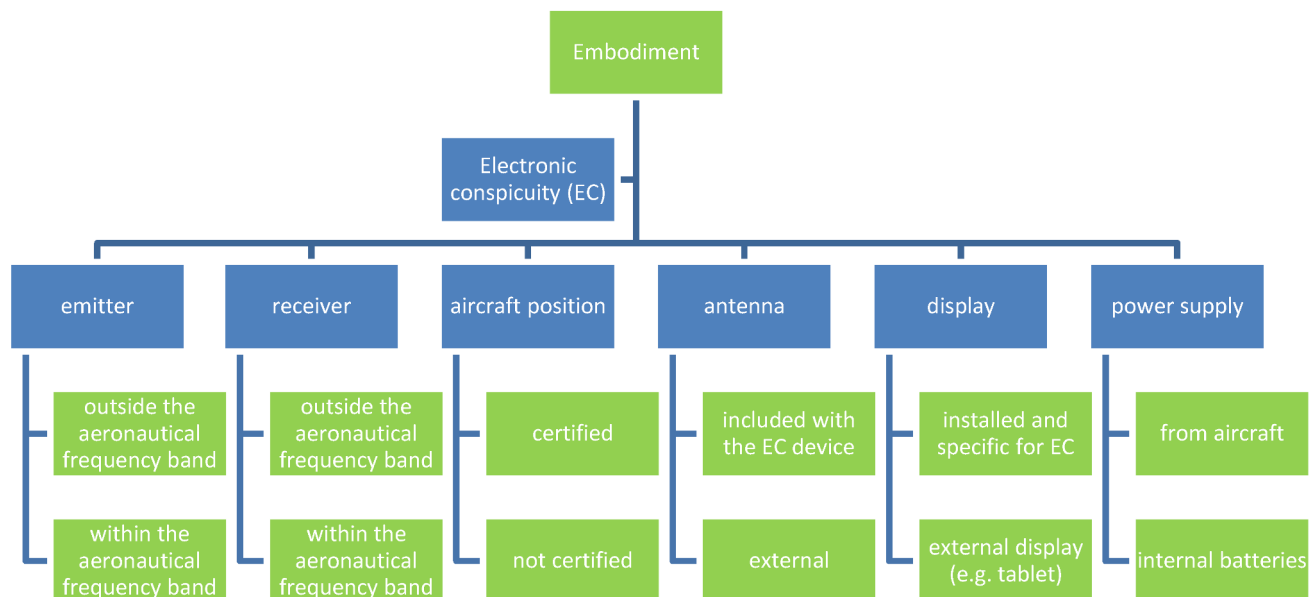


Figure 1: Logical illustration of the elements and the options for an ECElectronic conspicuity (EC) function or device

The following table contains the conditions that are applicable to the installation and to any element that is included in the ECElectronic conspicuity (EC) function or device. For example, if the ECElectronic conspicuity (EC) function or device does not have an ‘emitter within the aeronautical frequency band’, the related aeronautical declarations/conditions do not apply. In the latter case, the specific telecommunications declarations apply.

Element	Related declarations/conditions
Internal batteries	The equipment manufacturer has declared how the risks associated with internal lithium batteries, if any, were considered. Refer to CS STAN.47 in Subpart A for guidance.
Internal antenna	The equipment manufacturer has declared the size and mass of the antenna to be installed in the cockpit. The installer checks that such an antenna can be installed without obstructing any installed equipment or blocking any exit.
External antenna	The equipment manufacturer declares whether the antenna is certified or not, and the conditions for its installation. Such installations may use CS-SC004(). Antennas that do not emit within the aeronautical frequency band are eligible for installation without an EASA Form 1.

Element	Related declarations/conditions
Emitter outside the aeronautical frequency band	The equipment manufacturer shall declare how any such emitter used in the EC function electronic conspicuity (EC) function or device complies with the applicable telecommunications regulations. The operating manual shall indicate any restrictions and licence conditions as applicable to a specific country or continent. Such a transmitter is eligible for installation without an EASA Form 1. Note 1: Such transmitters generally require a radio or a telecommunications radio or station licence in accordance with national regulations. However,

<p>‘short-range devices’ (SRDs) are low-power radio transmitters that use shared frequency bands on a licence-exempt basis.</p> <p>Note 2: SRD frequency bands are harmonised across the EU. However, using SRD bands always means that access to the spectrum is shared with other users and/or other applications. In addition, SRD bands can only be used on a non-protected and non-interference basis: this means that SRDs have to protect themselves and to coexist with each other.</p>
---

Element	Related declarations/conditions	
Emitter within the aeronautical frequency band	Transponder-based 1090-MHz extended squitter ADS-B transmitters	<p>The equipment manufacturer has declared how the transponder was certified and how to install it with an EASA Form 1.</p> <p>CS-SC002() provides one means to install the transponder.</p> <p>CS-SC005() defines one means to add the extended squitter for ADS-B to the transponder.</p>
	1090-MHz non-transponder devices (NTDs)	<p>The equipment manufacturer has indicated that:</p> <ul style="list-style-type: none"> <li>— such elements require a radio licence in accordance with national regulations, even if they comply with ETSO-C166() or equivalent standards;</li> <li>— national regulations may prohibit such usage;</li> <li>— they are only usable in national airspace.</li> </ul> <p>The equipment manufacturer has declared whether the installation needs an EASA Form 1, under national regulations.</p> <p>The operating manual contains usage restrictions in each EU Member State.</p>
	978-MHz UAT emitters	<p>The equipment manufacturer has indicated that:</p> <ul style="list-style-type: none"> <li>— such elements require a radio licence in accordance with national regulations, even if they comply with ETSO-C154c or equivalent standards;</li> <li>— national regulations may prohibit such usage;</li> <li>— they are only usable in national airspace.</li> </ul> <p>The equipment manufacturer has declared whether the installation requires an EASA Form 1, under national regulations.</p> <p>The operating manual contains usage restrictions in each EU Member State.</p>
	<p>Note: There have been some SESAR trials for Electronic Visibility via ADS-B (EVA)<sup>19</sup>. In the context of other initiatives, trials have been conducted for UAT weather and traffic<sup>20</sup>. All these local initiatives could provide a pragmatic approach to define suitable requirements. Convergence on a European technical specification with harmonised frequencies will be a necessary step to achieve unrestricted usage across the EU.</p>	

Element	Related declarations/conditions
---------	---------------------------------

Receiver	<p>Element Related declarations/conditions</p> <p>The equipment manufacturer has declared whether:</p> <ul style="list-style-type: none"> <li>— the reception is within the aeronautical frequency band and/or outside the aeronautical frequency band;</li> <li>— the receiver holds an ETSO authorisation, or equivalent authorisation;</li> <li>— the receiver requires an EASA Form 1 for installation.</li> </ul> <p>Note: Receivers that do not hold an ETSO authorisation, or equivalent authorisation, can be installed without an EASA Form 1.</p> <p>The equipment manufacturer has indicated that receivers with an ETSO operating on the UAT frequency might only receive local services under local conditions. The equipment manufacturer has also indicated whether an EASA Form 1 is required.</p> <p>Note: UAT is not intended to be operated in European airspace.</p>	
	ETSO-C157b receivers or	Some trials or services might be provided locally.
	ETSO-C154c receivers only (class A2)	Local conditions apply.
Aircraft position	<p>The equipment manufacturer has declared whether the aircraft position source holds an ETSO authorisation, or equivalent. The equipment manufacturer has indicated whether the installation of the position source requires an EASA Form 1.</p> <p>Note: Position sources that do not hold an ETSO authorisation, or equivalent authorisation, can be installed without an EASA Form 1.</p>	
Display	<p>The equipment manufacturer has provided a means (specific display or portable unit) to display the traffic received by the EC function. The equipment manufacturer has provided instructions to install such a specific display in a manner that ensures that this specific display is independent from any display associated with a unit required for the intended operation.</p> <p>The components of the ECElectronic conspicuity (EC) function or device can be of any colour, provided the colours differ sufficiently from the colours used for warnings, cautions, and advisories, to avoid possible confusion.</p> <p>The equipment manufacturer has provided instructions to install such a display so that it does not obstruct the primary field of view of equipment that is essential for the safe operation of the aircraft.</p> <p>The equipment manufacturer has indicated whether the installation of the position source requires an EASA Form 1.</p>	

Element	Related declarations/conditions
Embodiment	<p>The equipment is qualified suitable for the environmental conditions to be expected during normal operations; see CS STAN.42 in Subpart A for guidance.</p> <p>Any non-ETSO transmitter shall be located away from the aircraft instrument required for the flight to minimise the risk of interference.</p> <p>The equipment might include an obstacle awareness function.</p> <p>The equipment manufacturer has declared that the ECElectronic conspicuity (EC) function or device exclusively relies on its own systems/units in order to</p>

provide its intended function. Databus/data connectivity between the ECElectronic conspicuity (EC) function or device and other equipment which is:

- ETSO authorised (or equivalent authorisation); or
- required by the TDCS, AFM or POH; or
- required by other applicable requirements such as those for operations and airspace,

is not allowed unless the ECElectronic conspicuity (EC) function or device is explicitly listed by its manufacturer as compatible equipment to which the other equipment can be connected.

If the ECElectronic conspicuity (EC) function or device is included in a part or appliance that is required for the flight, then the equipment manufacturer has declared that all the elements of the electronic conspicuity (EC) function or device contributing to the required part or appliance are certified. The equipment manufacturer has provided the declarations associated with the required part or appliance. Such declarations explicitly include instructions for installation with or without an EASA Form 1. For example, an electronic conspicuity (EC) function or device included in a position light and an anti-collision light shall comply with ETSO-C30c and ETSO-C96a, or equivalent standards. CS-SC031b may be used to install the light. If the unit emits in the UAT frequency band, the conditions for the transmitter within the aeronautical frequency band above would also apply.

- The installer may only install parts included in the ECElectronic conspicuity (EC) function or device with an EASA Form 1, unless the equipment manufacturer has explicitly declared that the parts can be installed without an EASA Form 1.
- If the electronic conspicuity (EC) function or device is not exclusively powered by internal batteries, the following conditions apply:
  - The installer follows the guidelines set out in Chapter 2 of FAA Advisory Circular AC 43.13-2B or equivalent standards.
  - The installer verifies that the power consumption is compatible with the aircraft installation. The results of the electrical-load analysis are recorded, or referred to, in EASA Form 123.
  - The installer follows the instructions from the equipment manufacturer for electrical protection.
  - If a non-essential supply (bus bar) exists, the installer uses this bus to power the electronic conspicuity (EC) function or device.
  - The installer follows the wiring instructions from the equipment manufacturer and the guidelines from FAA AC 43.13-1B or equivalent standards.
- The maximum mass of the EC device does not exceed 300 g. For a mass slightly above 300 g, the installer shall assess the compatibility of the mounting instructions from the equipment manufacturer with the characteristics of the intended mounting location.
- The electronic conspicuity (EC) function or device may be permanently fitted to the aircraft or it may use a mounting system that may be installed by following the conditions of CS-SC105().
- The installer follows the equipment manufacturer instructions and tests.
- The installer performs ground tests in order to assess whether the performance of the installation is adequate, and complements or substitutes ground tests with installation check flights, as necessary. Refer to CS STAN.48 in Subpart A for additional guidance on installation check flights.

Such tests shall verify whether the arrangement of the ECElectronic conspicuity (EC) function or device

in the cockpit is suitable (in particular, no impairment of the pilot's view, absence of glare and reflections), as well as the electrical bonding, the correct functioning of all other equipment installed in the aircraft, and the lack of interference (EMI/EMC) with other systems. FAA Advisory Circular AC 43.13-1B, Chapter 11, or ASTM F2639-18 or subsequent revisions, provide an acceptable means to perform an EMI/EMC test.

---- end ----