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Via Email

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Subject: 8.33 KHz Voice Channel Spacing below FL195 – EASA answers to EUROCONTROL questions

Reference:

[R1] COMMISSION IMPLEMENTING REGULATION (EU) No 1079/2012 voice channels spacing for the single European sky

[R2] NMD/NS/CFC/005-2017 – Your letter to P.Ky dated 27. April 2017

[R3] COMMISSION REGULATION (EU) No 965/2012 technical requirements and administrative procedures related to air operations

[R4] COMMISSION IMPLEMENTING REGULATION (EU) No 923/2012 common rules of the air and operational provisions regarding services and procedures in air navigation

[R5] CS-ACNS, Initial Issue, 17 December 2013

[R6] Regulation (EC) No 216/2008 of the European Parliament and of the Council on common rules in the field of civil aviation and establishing a European Aviation Safety Agency

[R7] EASA Letter from Sascha Oliver Schott, TCO section Manager, on 13.04.2016 to member states TCO focal points

Dear Mr Sultana,

As the deployment of Commission Implementing Regulation (EU) No 1079/2012 (VCS Regulation) [R1], which is laying down the requirements for a coordinated introduction of air ground voice communications based on 8.33 kHz channel spacing within EU airspace and extends the use of 8.33 KHz below FL195, is affecting mostly the general aviation community, several States expressed the need for guidance related to the equipage requirements for this category of flights.

In this context, your letter [R2] asked EASA to participate to the Implementation Support Group (8.33 ISG) and raised several questions. Our Avionics expert, Nicolas Durandeu has been nominated the EASA focal point for this task and was involved in the preparation of this response.

By means of this letter, EASA provide EUROCONTROL with a response to the following questions already included in your letter [R2]:

1. The number of radio equipment required on board depending on the operating rules (IFR/VFR), airspace class and aircraft category
2. In case of two radios existing on board the possibility of having one radio with 8.33VCS capability and one radio in 25kHz

- Possibilities (certification/installation) to limit the usage of the 25 kHz radio only emergency transmissions on the appropriate frequency (121.5 MHz)

First question:

The number of radio equipment required on board depending on the operating rules (IFR/VFR), airspace class and aircraft category

To answer this question, initial airworthiness, air operations and airspace regulatory material is assessed in the following sections.

Initial airworthiness:

Certification specification	Number of required radios
CS-25 Large Aeroplanes (refer to 25.1307)	2 independent radios
CS-29 Large Rotorcraft (refer to 29.1307)	1 radio
CS-23 Normal, Utility, Aerobatic and Commuter Aeroplanes	No requirement
CS-27 Small Rotorcraft	No requirement
CS-LSA Light Sports Aeroplanes	No requirement
CS-VLA/CS-VLR Very Light Aeroplanes/Rotorcraft	No requirement
CS-22 Sailplanes	No requirement
CS-31GB/CS-31HB/CS-31TGB (CS-31)Balloons	No requirement

In addition, except for CS-LSA/CS-VLR, CS-22, CS31-GB/CS-321HB/CS-31TGB (day VFR only), each CS contains a requirement asking for conducting a safety analysis. Refer to the following requirements of the respective CS: 25.1309, 29.1309, 27.1309, 23.2510, CS-VLA 1309 or CS VLR-1309 at latest amendment.

This safety analysis leads the applicant to consider the typical failure condition: “total loss of voice communication”.

Common result agreed by EASA as regards to this failure condition is provided below:

- When flying in IFR: MAJOR effect
- When flying in IFR with Class I aeroplane: MINOR effect
- When flying in VFR (in an airspace where voice communication is required): MINOR effect

As per AC 23.1309-1E, Class I aeroplane are defined as being Single Reciprocating Engine (SRE) aircraft with a Maximum Certificated Gross Take-off Weight of less than 6,000 pounds (2721 kg). Besides, as per AMC and AC 25.1309, MAJOR effect can be converted into a maximum 10^{-5} /FH failure rate and MINOR into a maximum 10^{-3} /FH failure rate.

Considering the usual equipment MTBF (around 10000 (10^4) FH translating), the table above can be refined into:

Certification specification	Number of required radios	
	VFR	IFR
CS-25	2 independent radios	
CS-23 Class I	1 radio when a radio is required either by OPS or airspace requirements	1 radio
CS-29 / CS-27 / other CS-23	1 radio when required either by OPS or airspace	2 independent radios
CS-LSA / CS-VLA/CS-VLR/CS-31	1 radio when required either by OPS or airspace	N/A

Air operations (OPS) rule:

The regulation for air operations No (EU) 965/2012 [R3] only applies to European operators and not all airspace users.

Following review of requirements CAT.IDE.A/H.330, CAT.IDE.A/H.340, CAT.IDE.A/H.345, NCC.IDE.A/H.245, NCO.IDE.A/H.190, SPO.IDE.A/H.215, NCO.IDE.S.145¹, NCO.IDE.B.145¹, SPO.IDE.S.145¹ and SPO.IDE.B.145¹, the following table can be set:

OPS part	VFR	IFR or VFR with no visual landmarks
CAT ²	1 radio required	2 independent radios required
NCC ²	According to airspace If 2 radios required ³ , independency is required	1 radio required If 2 radios required ³ , independency is required
NCO ²	According to airspace If 2 radios required ³ , independency is required	According to airspace If 2 radios required ³ , independency is required
SPO ²	According to airspace If 2 radios required ³ , independency is required	1 radio required If 2 radios required ³ , independency is required
NCO/SPO Sailplane	According to airspace	According to airspace
NCO/SPO Balloon	According to airspace	According to airspace

¹: European states can opt out from the current rule for balloons and sailplanes until 8. April 2018 from the applicability of the regulation and maintain current national rules. Only Poland has not used that provision. Further, to ease readability of the rule and to reply to the request of the community, specific OPS regulation for balloons and sailplanes are under development and will replace the current rule, while maintaining the current requirements for communication equipment. The new regulation, which is under publication preparation, may change the opt out provisions.

²: The following acronyms stand for:

- CAT: commercial air transport
- NCC: non-commercial operations with complex motor-powered aircraft⁴
- NCO: non-commercial operations with other-than-complex motor-powered aircraft⁴
- SPO: Specialised operations, ‘specialised operation’ means any operation other than commercial air transport where the aircraft is used for specialised activities such as agriculture, construction, photography, surveying, observation and patrol, aerial advertisement; [[R3], Article 2, (7)]

³: This “2 radios requirement” can only come from initial airworthiness requirements as airspace rules do not have such prescriptive requirement.

Additionally, as per CAT/NCC/NCO/SPO.IDE.A/H/S/B.100, the required radios need to be airworthiness approved. When a radio is not required (e.g. by the airspace or initial airworthiness), this one does not need to be airworthiness approved when not installed (handheld radios).

⁴ Regulation (EU) No 216/2008 [R6] defines in article 3 (j) complex motor powered aircraft as

(i) *an aeroplane:*

- *with a maximum certificated take-off mass exceeding 5 700 kg, or*
- *certificated for a maximum passenger seating configuration of more than nineteen, or*
- *certificated for operation with a minimum crew of at least two pilots, or*
- *equipped with (a) turbojet engine(s) or more than one turboprop engine, or*

(ii) *a helicopter certificated:*

- *for a maximum take-off mass exceeding 3 175 kg, or*
- *for a maximum passenger seating configuration of more than nine, or*
- *for operation with a minimum crew of at least two pilots, or*

(iii) *a tilt rotor aircraft;*

This means CS-25, CS-29 and some but not all CS-23 aircraft are complex motor powered aircraft.

Airspace requirements

Section 6 (Airspace classification) / SERA.6001 of COMMISSION IMPLEMENTING REGULATION (EU) No 923/2012 [R4] provide information about airspace communication requirements.

Airspace Class	Type of flight	Type of communication
Class A	IFR only	Continuous
Class B, C, D	IFR and VFR	Continuous
Class E	IFR and VFR	Not continuous for VFR and Continuous for IFR

Class F	IFR and VFR	Not continuous for IFR
Class G	IFR and VFR	Not continuous for IFR

Additionally, as per SERA.6005 (a) *Radio mandatory zone (RMZ)*, “[...] airspace designated as a radio mandatory zone (RMZ) by the competent authority shall maintain continuous air- ground voice communication watch and establish two-way communication [...]”.

Consequently, the airspace class A, B, C and D and those designated as RMZ would require at least one radio on board the aircraft.

Nevertheless, the SERA.6001 and SERA.6005 of COMMISSION IMPLEMENTING REGULATION (EU) No 923/2012 does not impose a prescriptive required number of radio on-board the aircraft.

Synthesis

The number of required radios on-board the aircraft to comply with the European airspace, initial airworthiness and operational rules can be summarised as:

- A CS-25 aircraft shall be fitted with at least 2 independent radios whatever the intended operation and airspace flown into.
- When flying in IFR or CAT VFR with no visual landmarks:
 - 1 radio is required for CS-23 Class I aeroplane;
 - For all the other aircraft category, 2 independent radios are required
- When flying in VFR only:
 - CAT operation: 1 radio is required;
 - In the following specific airspaces: B, C, D or RMZ: 1 radio is required;
 - In all other cases, no radio is required.

Note: this synthesis does not apply to “third country operator” (TCO) aircraft referred to in Article 4(1)(d) of Regulation (EU) No 216/2008 [R6]. Those aircraft need to comply with ICAO Annex 6 and 8 requirements, not addressing VHF radio carriage explicitly, and the applicable airspace requirements. In a letter to EASA member states TCO focal points EASA clarified that TCO aircraft need to carry the number of radios specified in the AIP for the affected airspace [R7].

Second question:

In case of two radios existing on board the possibility of having one radio with 8.33VCS capability and one radio in 25 kHz

The following rule should be applied when flying into 8.33 kHz VCS airspace:

- When 2 radios are required (refer to answer to first question):
 - Both shall be 8.33 kHz VCS as per AMC1 ACNS.B.VCS.010 [R5].
- When 1 radio is required (refer to answer to first question):

- A least 1 radio shall be 8.33 kHz VCS. It is possible to have further radio(s) that is (are) 25 kHz VCS only;
- Upon failure of the 8.33 kHz VCS radio:
 - 25 kHz VCS only radio shall only be used on emergency frequency (121.5 MHz) or on 25 kHz frequencies assigned by ATS
- When no radio is required (refer to answer to first question):
 - Aircraft can be fitted with 25 kHz VCS only radio(s) on the condition that:
 - 25 kHz VCS only radio shall only be used on emergency frequency (121.5 MHz) or on 25 kHz frequencies assigned by ATS

Note: this synthesis does not apply to “third country operator” (TCO) aircraft referred to in Article 4(1)(d) of Regulation (EU) No 216/2008 [R6]. Those aircraft need to comply with ICAO Annex 6 and 8 requirements and the applicable airspace requirements.

In a letter to national TCO focal points EASA clarified that TCO aircraft need to carry the number of radios specified in the AIP for the affected airspace [R7].

Third question:

Possibilities (certification/installation) to limit the usage of the 25 kHz radio only emergency transmissions on the appropriate frequency (121.5 MHz)

There is no way of limiting the access to specific frequencies through certification. It may infringe ICAO annex 10 requirements. Such radios would not meet the requirements applicable to airspace having 25 kHz VCS operation.

In case of any remarks or questions, please contact: Nicolas DURANDEAU (Avionics Systems Expert)
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Yours Sincerely,

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