

ETSI EN 300 676-2 V2.1.1 (2015-12)



**Ground-based VHF hand-held, mobile and
fixed radio transmitters, receivers and
transceivers for the VHF aeronautical mobile service
using amplitude modulation;
Part 2: Harmonised Standard covering the essential
requirements of article 3.2 of the Directive 2014/53/EU**

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Foreword

This Harmonised European Standard (EN) has been produced by ETSI Technical Committee Electromagnetic compatibility and Radio spectrum Matters (ERM).

The present document has been prepared in reply to the Commission's standardisation request Commission Implementing Decision C(2015) 5376 final of 04.08.2015 to provide a means of conforming to the essential requirements of Directive 2014/53/EU on the harmonisation of the laws of the Member States relating to the making available on the market of radio equipment.

Once the present document is cited in the Official Journal of the European Union under that Directive, compliance with the normative clauses of the present document given in table A.1 confers, within the limits of the scope of the present document, a presumption of conformity with the corresponding essential requirements of that Directive, and associated EFTA regulations.

The present document is part 2 of a multi-part deliverable covering the Ground-based VHF hand-held, mobile and fixed radio transmitters, receivers and transceivers for the VHF aeronautical mobile service using amplitude modulation; as identified below:

Part 1: "Technical characteristics and methods of measurement";

Part 2: "Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU".

National transposition dates

Date of adoption of this EN:	30 November 2015
Date of latest announcement of this EN (doa):	29 February 2016
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	31 August 2016
Date of withdrawal of any conflicting National Standard (dow):	31 August 2017

Modal verbs terminology

In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the [ETSI Drafting Rules](#) (Verbal forms for the expression of provisions).

"**must**" and "**must not**" are **NOT** allowed in ETSI deliverables except when used in direct citation.

Executive summary

The present document covers the essential requirements for efficient use of radio spectrum by DSB AM ground base stations, with channel separations of 8,33 kHz or 25 kHz intended for analogue speech and ground base stations with a channel spacing of 25 kHz intended for ACARS data communication. The current version includes necessary changes due to adaption to the new Radio Equipment Directive.

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1 Scope

The present document applies to ground based stations, ground mobile, ground-based direction finders and hand held radios for ground use. These radio equipment types are capable of operating in all or any part of the Aeronautical frequency band- between 118 MHz and 136,975 MHz.

The present document contains requirements to demonstrate that "... *Radio equipment shall be so constructed that it both effectively uses and supports the efficient use of radio spectrum in order to avoid harmful interference*" [i.1].

In addition to the present document, other ENs that specify technical requirements in respect of essential requirements under other parts of article 3 of the Directive 2014/53/EU [i.1] as well as essential requirements under the SES Interoperability Regulation 552/2004 [i.2] and related implementing rules and/or essential requirements under the EASA basic regulation 216/2008 [i.5] may apply to equipment within the scope of the present document.

2 References

2.1 Normative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

Referenced documents which are not found to be publicly available in the expected location might be found at <http://docbox.etsi.org/Reference>.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

The following referenced documents are necessary for the application of the present document.

- [1] ETSI EN 300 676-1 (V1.5.2) (03-2011): "Ground-based VHF hand-held, mobile and fixed radio transmitters, receivers and transceivers for the VHF aeronautical mobile service using amplitude modulation; Part 1: Technical characteristics and methods of measurement".
- [2] ETSI EN 300 113-1 (V1.6.2) (11-2009): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Land mobile service; Radio equipment intended for the transmission of data (and/or speech) using constant or non-constant envelope modulation and having an antenna connector; Part 1: Technical characteristics and methods of measurement".

2.2 Informative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

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The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

- [i.1] Directive 2014/53/EU of the European Parliament and of the Council of 16 April 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of radio equipment and repealing Directive 1999/5/EC.
- [i.2] Regulation (EC) No 552/2004 of the European Parliament and of the Council of 10 March 2004 on the interoperability of the European Air Traffic Management network (interoperability Regulation), OJ L 96, 31.03.2004, p. 26 as amended by Regulation (EC) No 1070/2009, OJ L 300, 14.11.2009, p. 34.
- [i.3] ETSI TR 100 028 (all parts) (V1.4.1): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics".

- [i.4] ETSI TR 100 028-2 (V1.4.1): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics; Part 2".
- [i.5] Regulation (EC) 216/2008 of the European Parliament and of the Council of 20 February 2008 on common rules in the field of civil aviation and establishing a European Aviation Safety Agency, and repealing Council Directive 91/670/EEC, Regulation (EC) No 1592/2002 and Directive 2004/36/EC.

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in Directive 2014/53/EU [i.1] and the following apply:

aeronautical mobile service: mobile service between aeronautical stations and aircraft stations, or between aircraft stations, in which survival craft stations may participate

conducted measurements: measurements which are made using a direct RF connection to the equipment under test

environmental profile: range of environmental conditions under which equipment within the scope of the present document is required to comply with the provisions of the present document

ground base station: aeronautical station equipment, in the aeronautical mobile service, for use with an external antenna and intended for use at a fixed location

hand held: radio equipment with integral batteries, designed to be hand portable and operated hand held

integral antenna equipment: radio communications equipment with an antenna integrated into the equipment without the use of an external connector and considered to be part of the equipment

NOTE: An integral antenna may be internal or external to the equipment. In equipment of this type, a 50 Ω RF connection point should be provided for test purposes. A connection point for an AF modulating input and for AF output measurements should also be provided.

mobile station: radio equipment designed for permanent or temporary vehicle installation and operation, including provision for vehicle DC power supply, and connections for external antenna, PTT key, microphone, speaker and/or headphone

non-integral antenna equipment: radio communications equipment with a connector intended for connection to an antenna

portable station: radio equipment with integral battery for independent hand-carried use

NOTE: Provisions may be made for connections of an external antenna, PTT key, microphone, headphone and charger, but principally to be operated as a self contained unit.

radiated measurements: measurements which involve the measurement of a radiated field

3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

ACARS	Aircraft Communications Addressing and Reporting System
AF	Audio Frequency
AM	Amplitude Modulation
DC	Direct Current (feeding, signalling)
DSB	Double Side Band
IF	Intermediate Frequency
PTT	Press To Talk
RE	Radio Equipment
RF	Radio Frequency
SES	Single European Sky

TX Transmitter
VHF Very High Frequency

4 Technical requirements specifications

4.1 Environmental profile

The technical requirements of the present document apply under the environmental profile for operation of the equipment, which shall be declared by the supplier, but as a minimum, shall be that specified in the test conditions contained in the present document. The equipment shall comply with all the technical requirements of the present document at all times when operating within the boundary limits of the declared operational environmental profile.

4.2 Conformance requirements

4.2.1 Transmitter requirements

4.2.1.0 Applicability

All technical requirements in clause 4.2.1 shall only be applicable to transmitter equipment (including transceiver equipment).

4.2.1.1 Frequency error

The frequency error as defined in clause 7.2 of ETSI EN 300 676-1 [1] shall not exceed the values shown in table 1 of ETSI EN 300 676-1 [1].

The conformance test shall be as given clause 5.3.1.1.

4.2.1.2 Carrier power (conducted)

The carrier power as defined in clause 7.3.1 of ETSI EN 300 676-1 [1] shall conform to the requirements in clause 7.3.3 of ETSI EN 300 676-1 [1].

The conformance test shall be as given clause 5.3.1.2.

4.2.1.3 Adjacent channel power

Adjacent channel power as defined in clause 7.5.1 of ETSI EN 300 676-1 [1] shall conform to the requirements in clause 7.5.3 of ETSI EN 300 676-1 [1].

The conformance test shall be as given clause 5.3.1.3.

4.2.1.4 Conducted spurious emissions

Conducted spurious emissions as defined in clause 7.7.1 of ETSI EN 300 676-1 [1] shall conform to the limits in clause 7.7.3, table 3 of ETSI EN 300 676-1 [1].

The conformance test shall be as given clause 5.3.1.4.

4.2.1.5 Intermodulation attenuation

Intermodulation attenuation as defined in clause 7.8.1 of ETSI EN 300 676-1 [1] shall conform to the limits in clause 7.8.3 of ETSI EN 300 676-1 [1].

This requirement shall not apply to ground mobile and hand held radio.

The conformance test shall be as given clause 5.3.1.5.

4.2.1.6 Keying transient frequency behaviour

Keying transient frequency behaviour as defined in clause 7.10.1 of ETSI EN 300 676-1 [1] shall conform to the limits in clause 7.10.3 of ETSI EN 300 676-1 [1].