

**Ground-based VHF hand-held, mobile and  
fixed radio transmitters, receivers and  
transceivers for the VHF aeronautical mobile service  
using amplitude modulation;  
Part 2: Harmonized EN covering essential requirements  
of article 3.2 of the R&TTE Directive**

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## Foreword

This final draft Harmonized European Standard (EN) has been produced by ETSI Technical Committee Electromagnetic compatibility and Radio spectrum Matters (ERM), and is now submitted for the ETSI standards One-step Approval Procedure.

The present document has been produced by ETSI in response to a mandate from the European Commission issued under Council Directive 98/34/EC (as amended) [i.4] laying down a procedure for the provision of information in the field of technical standards and regulations.

The title and reference to the present document are intended to be included in the publication in the Official Journal of the European Union of titles and references of Harmonized Standard under the Directive 1999/5/EC [i.1].

See article 5.1 of Directive 1999/5/EC [i.1] for information on presumption of conformity and Harmonised Standards or parts thereof the references of which have been published in the Official Journal of the European Union.

The requirements relevant to Directive 1999/5/EC [i.1] are summarised in annex A.

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: "Harmonized EN covering essential requirements under article 3.2 of the R&TTE Directive".**

<b>Proposed national transposition dates</b>	
Date of latest announcement of this EN (doa):	3 months after ETSI publication
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	6 months after doa
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## Introduction

The present document is part of a set of standards developed by ETSI and is designed to fit in a modular structure to cover all radio and telecommunications terminal equipment within the scope of the R&TTE Directive [i.1]. The modular structure is shown in EG 201 399 [i.3].

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# 1 Scope

The present document applies to DSB AM ground base stations, with channel separations of 8,33 kHz or 25 kHz intended for analogue speech intended for ACARS data communication. The scope of the present document is limited to ground based stations, ground mobile 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 is intended to cover the provisions of Directive 1999/5/EC (R&TTE Directive) [i.1], article 3.2, which states that "... radio equipment shall be so constructed that it effectively uses the spectrum allocated to terrestrial/space radio communications and orbital resources so as to avoid harmful interference".

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 R&TTE Directive [i.1] as well as essential requirements under the Single European Sky Interoperability Regulation (as amended) [2] and related implementing rules may apply to equipment within the scope of the present document.

NOTE: A list of such ENs is included on the web site <http://www.newapproach.org>.

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# 2 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 reference 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.

## 2.1 Normative references

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

- [1] ETSI EN 300 676-1 (V1.5.2): "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 (V1.6.1): "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".
- [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".

## 2.2 Informative references

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 1999/5/EC of the European Parliament and of the Council of 9 March 1999 on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity; amended by Regulation (EC) No 1882/2003 of the European Parliament and of the Council of 29/09/2003.

- [i.2] Regulation (EC) 552/2004 of the European Parliament and Council of 10 March 2004 on the interoperability of the European Air Traffic Management network (the interoperability Regulation); Official Journal L 096, 31/03/2004.
- [i.3] ETSI EG 201 399: "Electromagnetic compatibility and Radio spectrum Matters (ERM); A guide to the production of candidate Harmonized Standards for application under the R&TTE Directive"; amended by Regulation (EC) No 1070/2009 of the European Parliament and of the Council of 21/10/2009. Official Journal L 300/34, 14/11/2009.
- [i.4] Directive 98/34/EC of the European Parliament and of the Council of 22 June 1998 laying down a procedure for the provision of information in the field of technical standards and regulations.

## 3 Definitions and abbreviations

### 3.1 Definitions

For the purposes of the present document, the terms and definitions given in the R&TTE Directive [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  $\Omega$  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
ICAO	International Civil Aviation Organization
IF	Intermediate Frequency
PTT	Press To Talk
R&TTE	Radio and Telecommunications Terminal Equipment
RF	Radio Frequency

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## 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. 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

##### 4.2.1.1 Frequency error

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

##### 4.2.1.2 Carrier power (conducted)

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

##### 4.2.1.3 Adjacent channel power

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

##### 4.2.1.4 Conducted spurious emissions

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

##### 4.2.1.5 Intermodulation attenuation (Applicable to Base stations only)

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

##### 4.2.1.6 Keying transient frequency behaviour (Applicable to base stations only)

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

##### 4.2.1.7 Cabinet radiation

The transmitter shall conform to clause 7.12 of EN 300 676-1 [1].



## 4.2.2 Receiver requirements

NOTE: These aspects and parameters are considered essential to ensure immediate and successful ground to air communication. Inadequate performance in any of these aspects may lead to retransmission with consequential inefficient use of the spectrum.

### 4.2.2.1 Sensitivity

Sensitivity as defined in clause 8.1.1 of EN 300 676-1 [1] shall conform to the limits in clause 8.1.3 of EN 300 676-1 [1].

### 4.2.2.2 Adjacent channel rejection

Adjacent channel rejection as defined in clause 8.6.1 of EN 300 676-1 [1] shall conform to the limits in clause 8.6.3 of EN 300 676-1 [1].

### 4.2.2.3 Spurious response rejection

Spurious response rejection as defined in clause 8.7.1 of EN 300 676-1 [1] shall conform to the limits in clause 8.7.5 of EN 300 676-1 [1].

### 4.2.2.4 Intermodulation response rejection

Intermodulation response rejection as defined in clause 8.8.1 of EN 300 676-1 [1] shall conform to the limits in clause 8.8.3 of EN 300 676-1 [1].

### 4.2.2.5 Blocking or desensitisation

Blocking or desensitisation as defined in clause 8.9.1 of EN 300 676-1 [1] shall conform to the limits in clause 8.9.3 of EN 300 676-1 [1].

### 4.2.2.6 Conducted spurious emissions

Conducted spurious emissions as defined in clause 8.10.1 of EN 300 676-1 [1] shall conform to the limits in clause 8.10.3 (see table 4) of EN 300 676-1 [1].

### 4.2.2.7 Cross modulation rejection

Cross modulation rejection as defined in clause 8.12.1 of EN 300 676-1 [1] shall conform to the limits in clause 8.12.3 of EN 300 676-1 [1].

### 4.2.2.8 Cabinet radiation

The receiver shall conform to clause 8.17 of EN 300 676-1 [1].

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## 5 Testing for compliance with technical requirements

### 5.1 Environmental conditions for testing

The test conditions and procedures shall be as defined in clauses 5 and 6 of EN 300 676-1 [1].