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Radiodifuzijski zvočni sprejemniki - 2. del: Radiodifuzijska zvočna storitev AM - Harmonizirani standard za dostop do radijskega spektra

Broadcast Sound Receivers - Part 2: AM broadcast sound service - Harmonised Standard for access to radio spectrum

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Foreword

This draft Harmonised European Standard (EN) has been produced by ETSI Technical Committee Electromagnetic compatibility and Radio spectrum Matters (ERM), and is now submitted for the combined Public Enquiry and Vote phase of the ETSI standards EN Approval Procedure.

The present document has been prepared under the Commission's standardisation request C(2015) 5376 final [i.2] to provide one voluntary 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 and repealing Directive 1999/5/EC [i.1].

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. Full details of the entire series can be found in part 1 [1].

The present document has a number of test data files that are contained in archive en_30334501v010101p0.zip which accompanies ETSI EN 303 345-1 [1].

Proposed national transposition dates	
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
Date of withdrawal of any conflicting National Standard (dow):	18 months after doa

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.

Introduction

The present document provides the necessary limits and conformance requirements for radio receivers to meet the essential requirements of article 3.2 of Directive 2014/53/EU [i.1] for the AM sound broadcast service and is used with reference to ETSI EN 303 345-1 [1], which describes the generic requirements and test methods.

1 Scope

The present document specifies technical characteristics and methods of measurements for broadcast sound receivers with AM demodulation.

NOTE: The relationship between the present document and essential requirements of article 3.2 of Directive 2014/53/EU [i.1] is given in annex A.

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 https://docbox.etsi.org/Reference/.

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

[1] ETSI EN 303 345-1 (V1.1.1) (06-2019): "Broadcast Sound Receivers; Part 1: Generic requirements and measuring methods".

[2] Recommendation ITU-R BS.468-4 (07-1986): "Measurement of audio-frequency noise voltage level in sound broadcasting".

[3] Recommendation ITU-R BS.559-2 (06-1990): "Objective measurement of radio-frequency protection ratios in LF, MF and HF broadcasting".

[4] EN 55032:2015: "Electromagnetic compatibility of multimedia equipment - Emission Requirements", produced by CENELEC.

2.2 Informative references

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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] Commission Implementing Decision C(2015) 5376 final of 4.8.2015 on a standardisation request to the European Committee for Electrotechnical Standardisation and to the European Telecommunications Standards Institute as regards radio equipment in support of Directive 2014/53/EU of the European Parliament and of the Council.

[i.3] Void.

[i.4] Void.

[i.5] Recommendation ITU-R BS.1615-1: "Planning parameters for digital sound broadcasting at frequencies below 30 MHz".

[i.6] AES17: "AES standard method for digital audio engineering - Measurement of digital audio equipment".

[i.7] ETSI EG 203 336 (V1.1.1) (08-2015): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Guide for the selection of technical parameters for the production of Harmonised Standards covering article 3.1(b) and article 3.2 of Directive 2014/53/EU".

[i.8] ITU GE75: "Final Acts of the Regional Administrative LF/MF Broadcasting Conference (Regions 1 and 3)".

[i.9] Recommendation ITU-R BS.560-4 (10-1997): "Radio-frequency protection ratios in LF, MF and HF broadcasting".

[i.10] Recommendation ITU-R SM.332-4 (07-1978): "Selectivity of Receivers".

3 Definition of terms, symbols and abbreviations

3.1 Terms

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

built-in antenna: antenna that cannot be detached from the equipment

crest factor: peak to rms voltage ratio

external antenna: antenna designed to be connected to the equipment with the use of a 50 Ω or 75 Ω external connector

integral antenna: antenna which is detachable from the equipment without the use of any tools, and not using a 50 Ω or 75 Ω external connector

NOTE: A device that uses a supplied earphone as the antenna has an integral antenna.

3.2 Symbols

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

dBFS	decibels relative to Full Scale in accordance with AES17 [i.6]
dBm	decibels relative to 1 mW of power
dBQ	audio decibels after Recommendation ITU-R BS.468-4 [2] noise weighting and a quasi-peak detector have been applied
dBμV/m	decibels relative to 1 μV/m

3.3 Abbreviations

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

ACS	Adjacent Channel Selectivity
ADC	Analogue to Digital Converter
AM	Amplitude Modulation
BS	Broadcast Sound
BW	BandWidth
DDC	Direct Digital Conversion
EFTA	European Free Trade Association
EU	European Union
HF	High Frequency

IQ	In-phase and Quadrature
ITU-R	International Telecommunications Union - Radiocommunications sector
LF	Low Frequency
LO	Local Oscillator
MF	Medium Frequency
NZIF	Near-Zero Intermediate Frequency
PC	Personal Computer
RED	Radio Equipment Directive
RF	Radio Frequency
RMS	Root Mean Square
SNR	Signal to Noise Ratio
USB	Universal Serial Bus

4 Technical requirements specifications

4.1 Test signal configurations

The generated AM signals (wanted, unwanted and blocking) shall be in accordance with table 1. The configuration is based on Recommendation ITU-R BS.1615-1 [i.5].

Table 1: AM configuration

Parameter	AM signals		
	Wanted	Unwanted	Blocking
Audio modulation	1 kHz tone	Weighted noise Recommendation ITU-R BS.559-2 [3], clause 1, band-limited to 4,5 kHz (see note 1)	1 kHz tone
Other modulation parameters	40 % depth	22,8 % RMS depth (see note 2)	80 % depth
NOTE 1: The filter shall have a cut-off frequency of 4,5 kHz and a minimum roll-off of 60 dB/octave.			
NOTE 2: This is equivalent to a quasi-peak modulation depth of 50 %. The demodulated audio level will have the same quasi-peak value as that of a carrier with 50 % AM modulation depth modulated with a 1 kHz sinusoid.			

The means of generating the noise modulation for the "unwanted" signal is shown in figure 1.