

# ETSI EN 301 357-2 V1.2.1 (2001-06)

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*Candidate Harmonized European Standard (Telecommunications series)*

**Electromagnetic compatibility  
and Radio spectrum Matters (ERM);  
Cordless audio devices in the range 25 MHz to 2 000 MHz;  
Consumer radio microphones and in-ear monitoring  
systems operating in the CEPT harmonized  
band 863 MHz to 865 MHz;  
Part 2: Harmonized EN under article 3.2  
of the R&TTE Directive**

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**Reference**

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## Foreword

This Candidate Harmonized European Standard (Telecommunications series) has been produced by ETSI Technical Committee Electromagnetic compatibility and Radio spectrum Matters (ERM).

The present document has been produced by ETSI in response to a mandate from the European Commission issued under Council Directive 98/34/EC [5] laying down a procedure for the provision of information in the field of technical standards and regulations.

The present document is intended to become a Harmonized Standard, the reference of which will be published in the Official Journal of the European Communities referencing the Directive 1999/5/EC [1] 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 ("the R&TTE Directive").

The present document is part 2 of a multi-part deliverable covering Cordless audio devices in the range 25 MHz to 2 000 MHz, Consumer radio microphones and in ear monitoring devices in the CEPT harmonized band 863-865 MHz, as identified below:

Part 1: "Technical characteristics and test methods";

**Part 2: "Harmonized EN under article 3.2 of the R&TTE Directive".**

National transposition dates	
Date of adoption of this EN:	15 June 2001
Date of latest announcement of this EN (doa):	30 September 2001
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	31 March 2002
Date of withdrawal of any conflicting National Standard (dow):	31 March 2003

## Introduction

The present document is part of a set of standards designed to fit in a modular structure to cover all radio and telecommunications terminal equipment under the R&TTE Directive [1]. Each standard is a module in the structure. The modular structure is shown in figure 1.

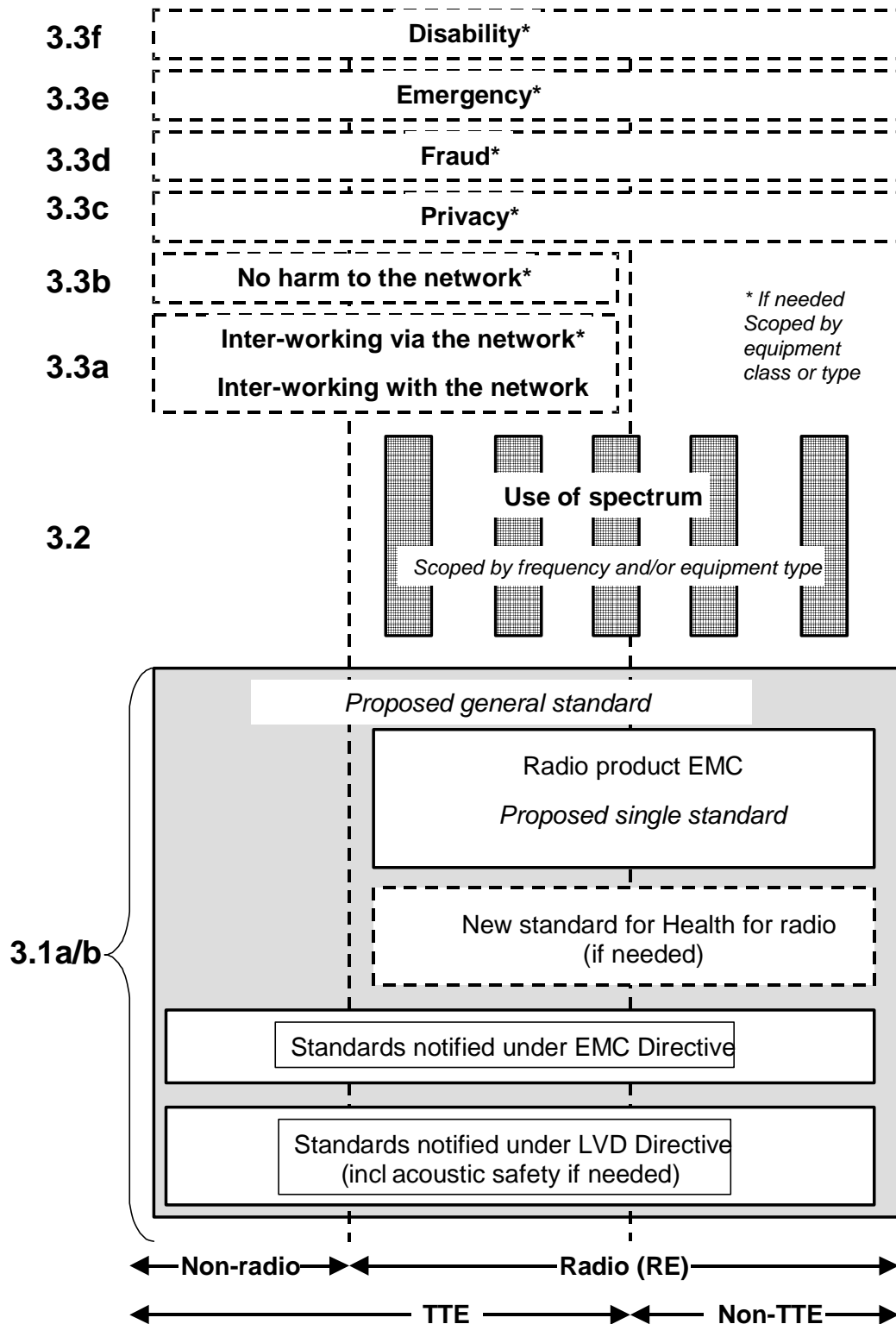


Figure 1: Modular structure for the various standards used under the R&TTE Directive

The left hand edge of the figure shows the different clauses of article 3 of the R&TTE Directive [1]. The essential requirements under article 3.1a (safety etc.) and 3.1b (EMC) are addressed by a proposed single General Standard that applies to all equipment. The proposed General Standard makes general cross references to those standards already notified under the LVD and EMC Directives that are appropriate for radio equipment and telecommunications terminal equipment and so provides a link to the arrangements under those directives thus avoiding duplication of notifications with potential problems of notifications not being synchronized.

The vertical boxes show the standards under article 3.2 for the use of the radio spectrum. The scopes of these standards are specified either by frequency (normally in the case where frequency bands are harmonized) or by radio equipment type.

For article 3.3 various horizontal boxes are shown. Their dotted lines indicate that essential requirements in these areas have to be adopted by the Commission. If such essential requirements are adopted, and as far and as long as they are applicable, they will justify individual standards whose scope is likely to be specified by function or interface type.

The bottom of the figure shows the relationship of the standards to radio equipment and telecommunications terminal equipment. A particular equipment may be radio equipment, telecommunications terminal equipment or both. The General Standard will always apply to it, and a radio spectrum standard will apply if it is radio equipment. An article 3.3 standard will apply as well only if the relevant essential requirement is adopted by the Commission and if the equipment in question lies within the scope of the corresponding standard. Thus, depending on the nature of the equipment, the essential requirements under the Directive may be covered in just the General Standard or in a set of standards that includes the General Standard.

The modularity principle has been taken because:

- it minimizes the number of standards needed. Because equipment may, in fact, have multiple interfaces and functions it is not practicable to produce a single standard for each possible combination of functions that may occur in an equipment;
- it provides scope for standards under articles 3.2 and 3.3 to be added when new frequency bands are agreed or when the Commission takes decisions under article 3 without requiring alteration of standards that are already published;
- it clarifies, simplifies and promotes the usage of Harmonized Standards as the relevant means of conformity assessment.

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# 1 Scope

The present document covers the minimum characteristics considered necessary in order to make the best use of the available frequencies. It does not necessarily include all the characteristics that may be required by a user, nor does it necessarily represent the optimum performance achievable.

Cordless audio devices covered within the present document are considered by definition short-range devices, the power limits for frequency bands will be found in the current version of CEPT/ERC/REC 70-03 [2] (or national regulations).

The present document applies to cordless audio, consumer radio microphones and in-ear monitoring equipment using either 300 kHz bandwidth with analogue modulation or 300 kHz, 600 kHz or 1 200 kHz digital FDMA modulation. The frequency bands for this equipment may differ from country to country as specified in their national regulations. All equipment is intended to be used with integral antennas.

Electromagnetic Compatibility (EMC) requirements are covered by EN 301 489-9 [3].

The types of equipment covered by the present document are as follows:

- cordless headphones;
- cordless loudspeakers;
- consumer radio microphones;
- in-ear monitoring;
- in-vehicle cordless;
- personal cordless;
- broadband multi-channel audio systems.

The present document is intended to cover the provisions of Directive 1999/5/EC (R&TTE Directive) [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 EN's that specify technical requirements in respect of essential requirements under other parts of article 3 of the R&TTE Directive [1] will apply to equipment within the scope of the present document.

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

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# 2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication and/or edition number or version number) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.

[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.

[2] CEPT/ERC/REC 70-03: "Relating to the use of Short Range Devices (SRD)".

- [3] ETSI EN 301 489-9: "ElectroMagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 9: Specific conditions for wireless microphones and similar Radio Frequency (RF) audio link equipment".
- [4] ETSI ETR 028: "Radio Equipment and Systems (RES); Uncertainties in the measurement of mobile radio equipment characteristics".
- [5] 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.
- [6] ETSI EN 301 357-1 (V1.2.1): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Cordless audio devices in the range 25 MHz to 2 000 MHz; Consumer radio microphones and in-ear monitoring systems operating in the CEPT harmonized band 863 MHz to 865 MHz; Part 1: Technical characteristics and test methods".

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## 3 Definitions, symbols and abbreviations

### 3.1 Definitions

For the purposes of the present document, the terms and definitions in the R&TTE Directive [1] and EN 301 357-1 [6] apply.

### 3.2 Symbols

For the purposes of the present document, the symbols defined in EN 301 357-1 [6] apply.

### 3.3 Abbreviations

For the purposes of the present document, the abbreviations defined in EN 301 357-1 [6] apply.

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## 4 Functional characteristics

### 4.1 Controls

Those controls that, if maladjusted, might increase the interfering potentialities of the equipment shall only be accessible by partial or complete disassembly of the device and requiring the use of tools.

### 4.2 Marking

The equipment shall be marked in a visible place. This marking shall be legible, tamper-proof and durable. The marking shall be according to the R&TTE Directive 1999/5/EC [1].

### 4.3 Transmitter requirements

#### 4.3.1 Frequency error

The frequency error, as defined in EN 301 357-1 [6], clause 8.1.1, shall not exceed the limits in EN 301 357-1 [6], clause 8.1.3, table 1.



### 4.3.2 Carrier power

The carrier power, as defined in EN 301 357-1 [6], clause 8.2.1, shall not exceed the limits in EN 301 357-1 [6], clause 8.2.3, table 3.

### 4.3.3 Channel bandwidth

The channel bandwidth, as defined in EN 301 357-1 [6], clause 8.3.1, shall not exceed the limits in EN 301 357-1 [6], clause 8.3.4, table 5, figures 3 and 4.

### 4.3.4 Spurious emissions

The spurious emissions, as defined in EN 301 357-1 [6], clause 8.4.1, shall not exceed the limits in EN 301 357-1 [6], clause 8.4.3, table 6.

## 4.4 Receiver requirements

### 4.4.1 Spurious emissions

The spurious emissions, as defined in EN 301 357-1 [6], clause 9.1.1, shall not exceed the limits in EN 301 357-1 [6], clause 9.1.5, table 8.

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## 5 Testing for compliance with technical requirements

### 5.1 Essential radio test suites

#### 5.1.1 Environmental conditions for testing

##### 5.1.1.1 Normal and extreme test-conditions

The test conditions shall be as declared by the manufacturer. The test procedures shall be as specified in EN 301 357-1 [6] clauses 6.2, 6.4.1.1 and 6.4.2.

##### 5.1.1.2 Test power source

The test power source shall meet the requirements of EN 301 357-1 [6], clause 6.2.

#### 5.1.2 Choice of samples for test suites

Measurement shall be performed, according to the present document, on samples of equipment defined in EN 301 357-1 [6], clauses 5.1.1 to 5.1.9.2.

#### 5.1.3 Transmitter test suites

##### 5.1.3.1 Frequency error

The test specified in EN 301 357-1 [6], clause 8.1.2 shall be carried out.

##### 5.1.3.2 Carrier power

The test specified in EN 301 357-1 [6], clauses 8.2.2.1 and 8.2.2.2 shall be carried out.

### 5.1.3.3 Channel bandwidth

The test specified in EN 301 357-1 [6], clauses 8.3.2 to 8.3.4 shall be carried out.

### 5.1.3.4 Spurious emissions

The test specified in EN 301 357-1 [6], clause 8.4.2 shall be carried out.

## 5.1.4 Receiver test suites

### 5.1.4.1 Spurious emissions

The test specified in EN 301 357-1 [6], clauses 9.1.2, 9.1.3 and 9.1.4 shall be carried out.

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## 6 Interpretation of the measurement results

The interpretation of the results recorded in the appropriate test report for the measurements described in the present document shall be as follows:

- the measured value related to the corresponding limit shall be used to decide whether an equipment meets the requirements of the present document;
- the measurement uncertainty value for the measurement of each parameter shall be separately included in the test report;
- the recorded value of the measurement uncertainty shall be, for each measurement, equal to or lower than the figures in the table of measurement uncertainty as in clause 10 of EN 301 357-1 [6].

The accumulated measurement uncertainties of the test system in use for the parameters to be measured shall not exceed those given in table 1. This is in order to ensure that the measurements remain within an acceptable standard. Uncertainty values for the RF parameters are valid to 2 GHz unless otherwise stated.

**Table 1: Measurement uncertainty**

Parameter	Uncertainty
RF frequency	$< \pm 1 \times 10^{-7}$
Audio output power	$< \pm 0,5$ dB
Radiated RF power	$< \pm 6$ dB
Conducted RF power variations using a test fixture	$< \pm 0,75$ dB
Maximum frequency deviation:	
- within 300 Hz and 6 kHz of audio frequency	$< \pm 5$ %
- within 6 kHz and 25 kHz of audio frequency	$< \pm 3$ dB
Deviation limitation	$< \pm 5$ %
Radiated emission of transmitter, valid up to 12,75 GHz	$< \pm 6$ dB
Radiated emission of receiver, valid up to 12,75 GHz	$< \pm 6$ dB

For the test methods, according to the present document the uncertainty figures shall be calculated according to the methods described in the ETR 028 [4] and shall correspond to an expansion factor (coverage factor)  $k = 1,96$  or  $k = 2$  (which provide confidence levels of respectively 95 % and 95,45 % in case where the distributions characterizing the actual measurement uncertainties are normal (Gaussian)).

Table 1 is based on such expansion factors.

The particular expansion factor used for the evaluation of the measurement uncertainty shall be stated.

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## History

Document history		
V1.1.1	August 2000	Publication
V1.2.1	July 2000	Public Enquiry PE 20001110: 2000-07-12 to 2000-11-10
V1.2.1	April 2001	Vote V 20010615: 2001-04-16 to 2001-06-15
V1.2.1	June 2001	Publication