

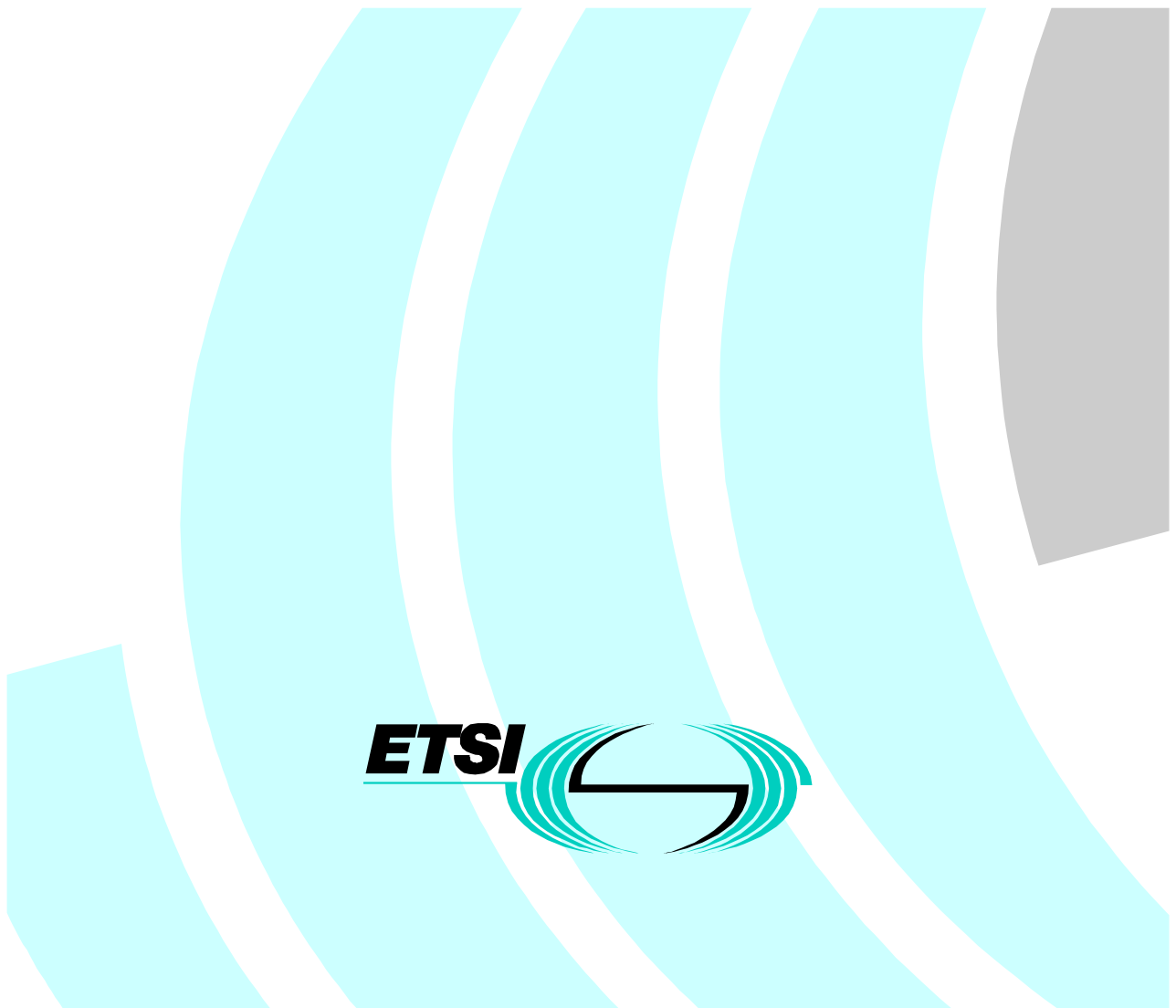
# ETSI EN 300 454-2 V1.1.1 (2000-08)

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*Candidate Harmonized European Standard (Telecommunications series)*

**Electromagnetic compatibility  
and Radio spectrum Matters (ERM);  
Wide band audio links;  
Part 2: Harmonized EN under article 3.2 of the R&TTE Directive**

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**Reference**

REN/ERM-RP08-0311-2

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Audio, data, radio mic, regulation, testing

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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 is part 2 of a multi-part EN covering the Electromagnetic compatibility and Radio spectrum Matters (ERM); Wide band audio links, as identified below:

Part 1: "Technical characteristics and test methods";

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

The present document has been produced by ETSI in response to a mandate from the European Commission issued under Council Directive 98/34/EC [6] 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 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") [1].

<b>National transposition dates</b>	
Date of adoption of this EN:	21 July 2000
Date of latest announcement of this EN (doa):	31 October 2000
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	30 April 2001
Date of withdrawal of any conflicting National Standard (dow):	30 April 2001

## 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.

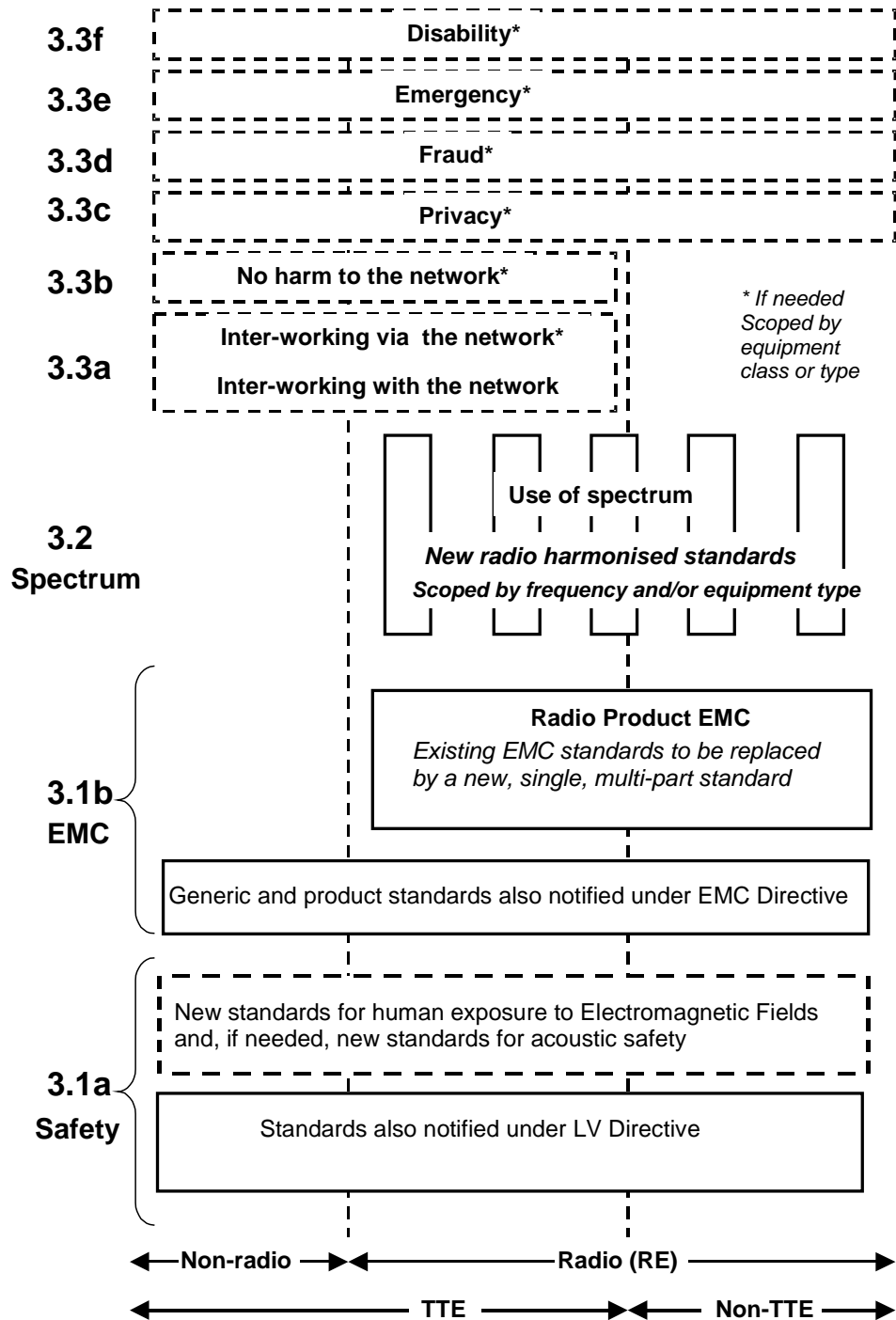


Figure 1: Modular structure for the various standards used under the R&TTE Directive [1]

The left hand edge of the figure 1 shows the different subclauses of Article 3 of the R&TTE Directive [1].

For article 3.3 various horizontal boxes are shown. Dotted lines indicate that at the time of publication of the present document 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 vertical boxes show the standards under article 3.2 for the use of the radio spectrum by radio equipment. 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 3.1b the diagram shows the new single multi-part product EMC standard for radio, and the existing collection of generic and product standards currently used under the EMC Directive [2]. The parts of this new standard will become available in the second half of 2000, and the existing separate product EMC standards will be used until it is available.

For article 3.1a the diagram shows the existing safety standards currently used under the LV Directive [3] and new standards covering human exposure to electromagnetic fields. New standards covering acoustic safety may also be required.

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. 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 under the R&TTE Directive [1] is adopted by the Commission and if the equipment in question is covered by the scope of the corresponding standard. Thus, depending on the nature of the equipment, the essential requirements under the R&TTE Directive [1] may be covered in a set of standards.

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 to be added:
  - under article 3.2 when new frequency bands are agreed; or
  - under article 3.3 should the Commission take the necessary decisions;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 applies to wideband audio link equipment operating on radio frequencies between 25 MHz and 3 GHz.

The present document does not apply to wideband audio link equipment employing Time Division Multiple Access (TDMA), frequency hopping and spread spectrum or similar forms of modulation.

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

- professional wideband audio links for one-way transmission;
- professional wideband audio links for two-way transmission;
- professional wideband audio links with extra facilities.

Equipment with controls that if maladjusted might increase its interfering potentialities, shall only be within the scope of the present document if those controls are only accessible by partial or complete disassembly of the device and requiring the use of tools.

The present document is intended to cover the provisions of Article 3.2 of Directive 1999/5/EC [1] (R&TTE Directive), 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 [1] may apply to equipment within the scope of the present document.

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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, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.
- A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

- [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 (R&TTE Directive).
- [2] Council Directive 89/336/EEC of 3 May 1989 on the approximation of the laws of the Member States relating to electromagnetic compatibility (EMC Directive).
- [3] Council Directive 73/23/EEC of 19 February 1973 on the harmonization of the laws of the Member States relating to electrical equipment designed for use within certain voltage limits (LV Directive).
- [4] ETSI EN 300 454-1 (V1.2): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Wideband audio links; Part 1: Technical characteristics and test methods".
- [5] ETSI ETR 028 (1994): "Radio Equipment and Systems (RES); Uncertainties in the measurement of mobile radio equipment characteristics".
- [6] 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.

- [7] ETSI EN 300 454-1: "Electromagnetic compatibility and Radio spectrum Matters (ERM); Wide band audio links; 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 300 454-1 [7] apply.

### 3.2 Symbols

For the purposes of the present document, the symbols defined in EN 300 454-1 [7] apply.

### 3.3 Abbreviations

For the purposes of the present document, the abbreviations defined in EN 300 454-1 [7] and the following apply.

EMC	Electro-Magnetic Compatibility
LV	Low Voltage
R&TTE	Radio and Telecommunications Terminal Equipment

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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 determined by the environmental class of the equipment. The equipment shall comply with all the technical requirements of the present document at all times when operating within the boundary limits of the required operational environmental profile.

### 4.2 Transmitter requirements

#### 4.2.1 Frequency error

##### 4.2.1.1 Definition

The transmitter frequency error shall be as defined in EN 300 454-1 [7], subclause 8.1.1.

##### 4.2.1.2 Limit

The transmitter frequency error limit shall be as stated in EN 300 454-1 [7], subclause 8.1.3 table 2.

##### 4.2.1.3 Conformance

Conformance tests as defined in subclause 5.3.1 shall be carried out.



## 4.2.2 Carrier power

### 4.2.2.1 Definition

The carrier power shall be as defined in EN 300 454-1 [7], subclause 8.2.1.

### 4.2.2.2 Limit

The carrier power limit shall be as stated in EN 300 454-1 [7], subclause 8.2.4.

### 4.2.2.3 Conformance

Conformance tests as defined in subclause 5.3.2 shall be carried out.

## 4.2.3 Channel bandwidth

### 4.2.3.1 Definition

The channel bandwidth shall be as defined in EN 300 454-1 [7], subclause 8.3.1.

### 4.2.3.2 Limit

The channel bandwidth limit shall be as stated in EN 300 454-1 [7], subclause 8.3.3 figure 4.

### 4.2.3.3 Conformance

Conformance tests as defined in subclause 5.3.3 shall be carried out.

## 4.2.4 Spurious emissions

### 4.2.4.1 Definition

The transmitter spurious emissions shall be as defined in EN 300 454-1 [7], subclause 8.4.1.

### 4.2.4.2 Limit

The transmitter spurious emissions limit shall be as stated in EN 300 454-1 [7], subclause 8.4.3 table 3.

### 4.2.4.3 Conformance

Conformance tests as defined in subclause 5.3.4 shall be carried out.

## 4.3 Receiver requirements

### 4.3.1 Spurious emissions

#### 4.3.1.1 Definition

The receiver spurious emissions shall be as defined in EN 300 454-1 [7], subclause 9.1.1.

#### 4.3.1.2 Limit

The receiver spurious emissions limit shall be as stated in EN 300 454-1 [7], subclause 9.1.3 table 5.

### 4.3.1.3 Conformance

Conformance tests as defined in subclause 5.3.5 shall be carried out.

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## 5 Testing for compliance with technical requirements

### 5.1 Test conditions, power supply and ambient temperatures

These shall be as described in EN 300 454-1 [7], clause 5 and subclauses 6.2 to 6.4.

### 5.2 Interpretation of the measurement results

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

- the measured value related to the corresponding limit will be used to decide whether an equipment meets the requirements of the present document;
- the value of the measurement uncertainty for the measurement of each parameter shall be 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 table 1.

For the test methods, according to the present document, the measurement uncertainty figures shall be calculated in accordance with ETR 028 [5] 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 the case where the distributions characterizing the actual measurement uncertainties are normal (Gaussian)).

**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

### 5.3 Essential radio test suites

#### 5.3.1 Frequency error

The test specified in EN 300 454-1 [7], subclause 8.1.2 shall be carried out. The results obtained shall be compared to the limits in subclause 4.2.1 in order to prove compliance with the requirement.

#### 5.3.2 Carrier power

The test specified in EN 300 454-1 [7], subclauses 8.2.2 and 8.2.3 shall be carried out. The results obtained shall be compared to the limits in subclause 4.2.2 in order to prove compliance with the requirement.

### 5.3.3 Channel bandwidth

The test specified in EN 300 454-1 [7], subclause 8.3.2 shall be carried out. The results obtained shall be compared to the limits in subclause 4.2.3 in order to prove compliance with the requirement.

### 5.3.4 Spurious Emissions

The test specified in EN 300 454-1 [7], subclauses 8.4.2 shall be carried out. The results obtained shall be compared to the limits in subclause 4.2.4 in order to prove compliance with the requirement.

### 5.3.5 Spurious Emissions

The test specified in EN 300 454-1 [7], subclauses 9.1.2, 9.1.3 and 9.1.4 shall be carried out. The results obtained shall be compared to the limits in subclause 4.3.1 in order to prove compliance with the requirement.

## Annex A (normative): The EN Requirements Table (EN-RT)

Notwithstanding the provisions of the copyright clause related to the text of the present document, ETSI grants that users of the present document may freely reproduce the EN-RT proforma in this annex so that it can be used for its intended purposes and may further publish the completed EN-RT.

The EN Requirements Table (EN-RT) serves a number of purposes, as follows:

- it provides a tabular summary of all the requirements;
- it shows the status of each EN-R, whether it is essential to implement in all circumstances (Mandatory), or whether the requirement is dependent on the supplier having chosen to support a particular optional service or functionality (Optional). In particular it enables the EN-Rs associated with a particular optional service or functionality to be grouped and identified;
- when completed in respect of a particular equipment it provides a means to undertake the static assessment of conformity with the EN.

**Table A.1: EN Requirements Table (EN-RT)**

EN Reference		EN 300 422-2				Comment
No.	Reference	EN-R (note)	Status			
1	4.2.1	Frequency error	M			
2	4.2.2	Carrier power	M			
3	4.2.3	Channel bandwidth	M			
4	4.2.4	Spurious emissions (Transmitter)	M			
5	4.3.1	Spurious emissions (Receiver)	M			

NOTE: These EN-Rs are justified under Article 3.2 of the R&TTE Directive.

### Key to columns:

- No** Table entry number;
- Reference** Subclause reference number of conformance requirement within the present document;
- EN-R** Title of conformance requirement within the present document;
- Status** Status of the entry as follows:
- M Mandatory, shall be implemented under all circumstances;
  - O Optional, may be provided, but if provided shall be implemented in accordance with the requirements;
  - O.n this status is used for mutually exclusive or selectable options among a set. The integer "n" shall refer to a unique group of options within the EN-RT. A footnote to the EN-RT shall explicitly state what the requirement is for each numbered group. For example, "It is mandatory to support at least one of these options", or, "It is mandatory to support exactly one of these options".
- Comments** To be completed as required.

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## History

<b>Document history</b>		
V1.1.1	March 2000	One-step Approval Procedure OAP 20000721: 2000-03-22 to 2000-07-21
V1.1.1	August 2000	Publication