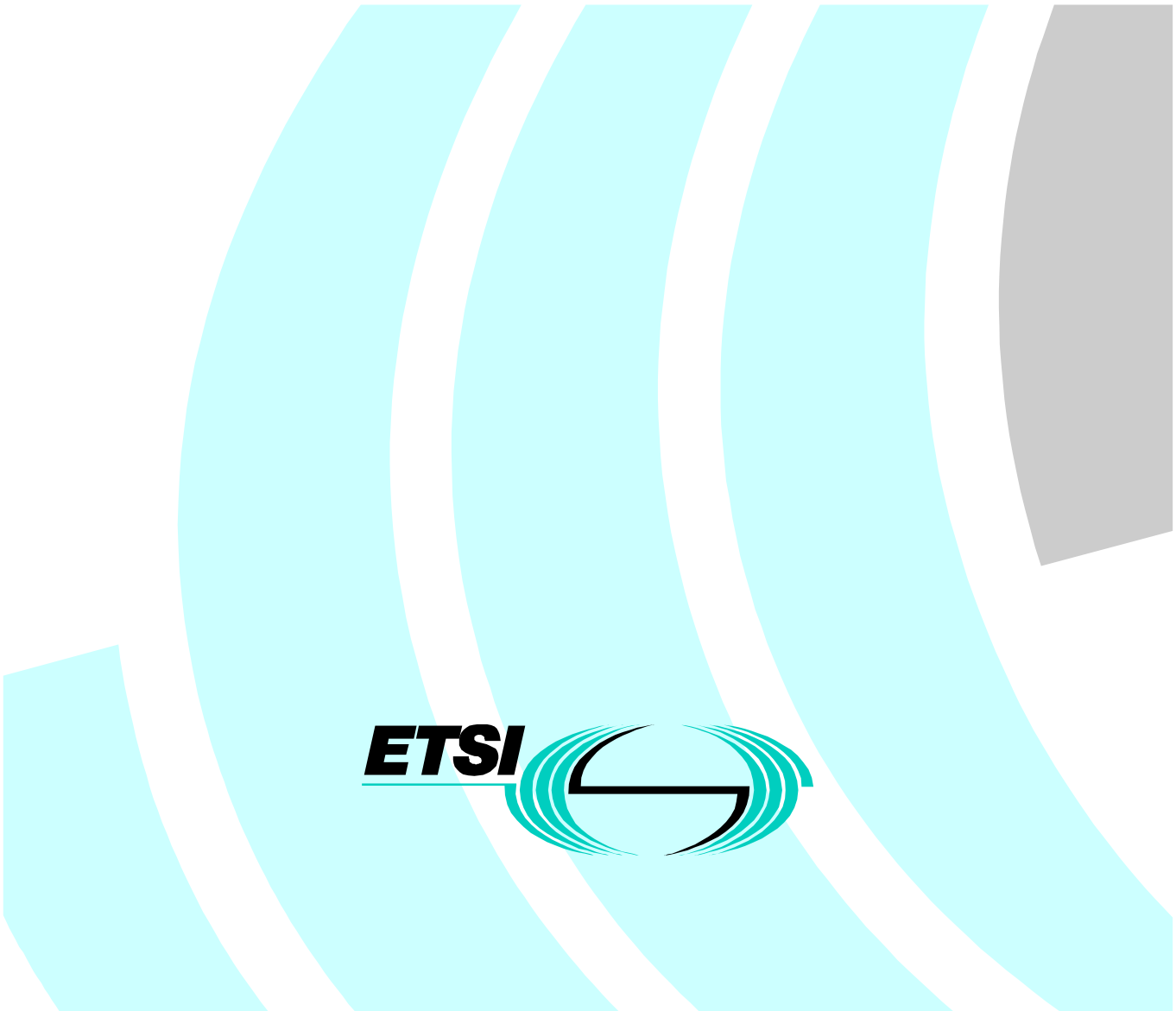
ETSI EN 300 390-2 V1.1.1 (2000-09)

Candidate Harmonized European Standard (Telecommunications series)

Electromagnetic compatibility and Radio spectrum Matters (ERM); Land Mobile Service; Radio equipment intended for the transmission of data (and speech) and using an integral antenna; Part 2: Harmonized EN covering essential requirements under article 3.2 of the R&TTE Directive



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Contents

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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); Land Mobile Service; Radio equipment intended for the transmission of data (and speech) and using an integral antenna, as identified below:

Part 1: "Technical characteristics and test conditions";

Part 2: "Harmonized EN covering essential requirements 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 [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").

National transposition dates	
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.

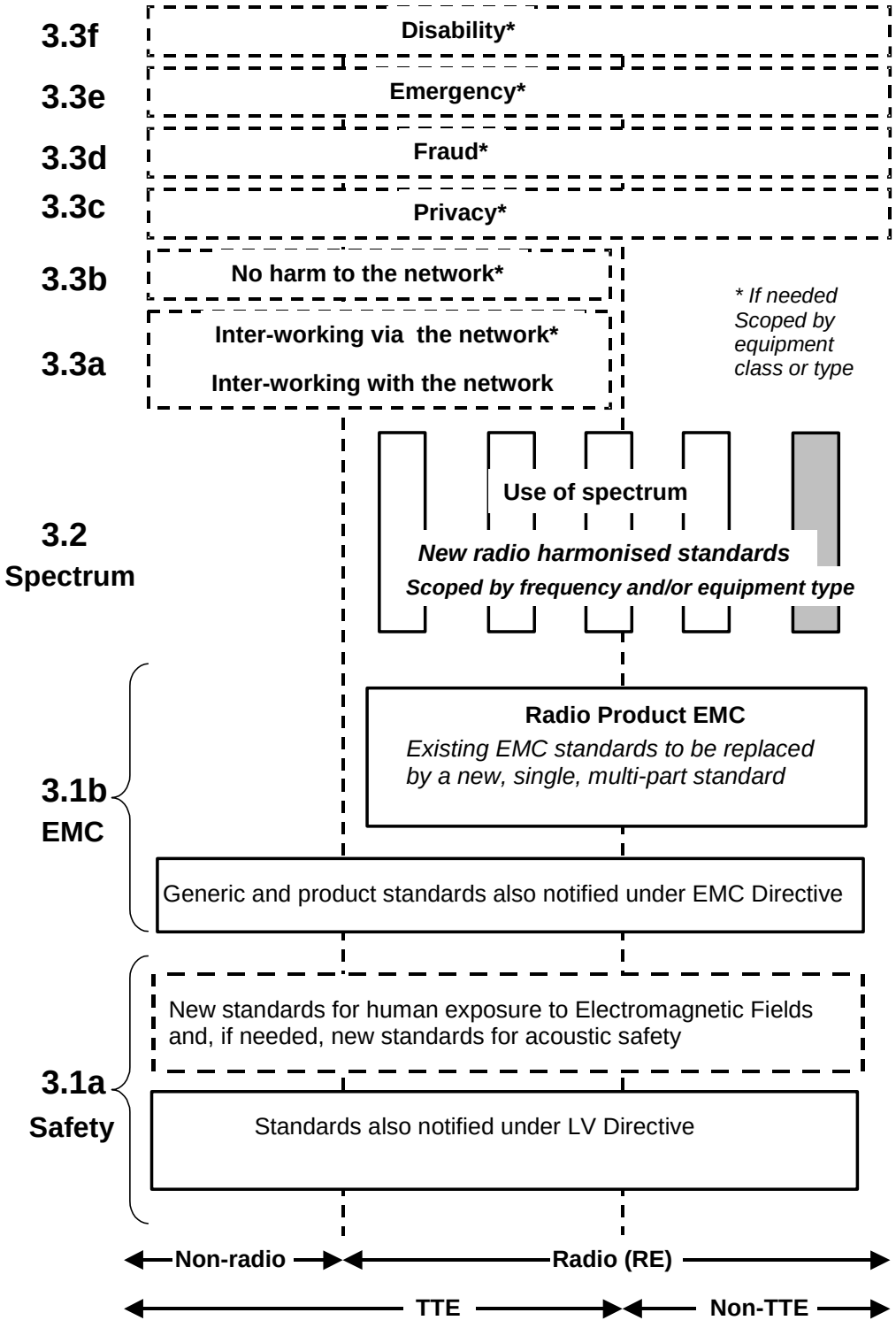

Figure 1: Modular structure for the various standards used under the R&TTE Directive [1]

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.

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 which may be required by a user, nor does it necessarily represent the optimum performance achievable.

The present document applies to constant envelope angle modulation systems for use in the land mobile service, using the available bandwidth, operating on radio frequencies between 30 MHz and 1 000 MHz, with channel separations of 12,5 kHz, 20 kHz and 25 kHz intended for data transmissions. It applies to digital and combined analogue and digital radio equipment which is hand portable, using an integral antenna and intended for the transmission of data and/or speech.

The technical characteristics given in this present document are independent of data rate but may in practice limit the maximum data rate achievable. Future editions of this present document may be prepared which may allow complex modulation methods, together with their appropriate limits, for use at higher bit rates.

In this present document, a digital radio equipment is defined as a radio equipment which transmits and/or receives data.

Data equipment is understood as equipment handling continuous bit streams or messages.

The equipment comprises a transmitter and associated encoder and modulator and/or a receiver and associated demodulator and decoder. The encoder and/or decoder may be a separate piece of equipment, in which case this present document covers the combination of encoder and/or decoder and transmitter and/or receiver equipment.

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.

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

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 300 390-1 (V0.1): "Land mobile service radio equipment intended for the transmission of data (and speech) and using an integral antenna; Technical characteristics and test conditions ".

[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.

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in the R&TTE Directive [1] and EN 300 390-1 [4] apply.

3.2 Symbols

For the purposes of the present document, the symbols given in EN 300 390-1 [4] apply.

3.3 Abbreviations

For the purposes of the present document, the abbreviations given in EN 300 390-1 [4] apply:

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

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 Conformance requirements

4.2.1 Transmitter frequency error

4.2.1.1 Definition

The transmitter frequency error is defined in EN 300 390-1 [4], subclause 8.1.1.

4.2.1.2 Limit

The transmitter frequency error limit shall be as stated in EN 300 390-1 [4], subclause 5.1.1 table 1.

4.2.1.3 Conformance

Conformance tests as defined in subclause 5.2.1 shall be carried out.

4.2.2 Effective radiated power

4.2.2.1 Definition

The effective radiated power is defined in EN 300 390-1 [4], subclause 8.2.1.

4.2.2.2 Limit

The effective radiated power limit shall be as stated in EN 300 390-1 [4], subclause 5.1.2.

4.2.2.3 Conformance

Conformance tests as defined in subclause 5.2.2 shall be carried out.

4.2.3 Adjacent channel power

4.2.3.1 Definition

The adjacent channel power is defined in EN 300 390-1 [4], subclause 8.3.1.

4.2.3.2 Limit

The adjacent channel power limit shall be as stated in EN 300 390-1 [4], subclause 5.1.3.

4.2.3.3 Conformance

Conformance tests as defined in subclause 5.2.3 shall be carried out.

4.2.4 Radiated spurious emissions

4.2.4.1 Definition

The radiated spurious emissions is defined in EN 300 390-1 [4], subclause 8.4.1.

4.2.4.2 Limit

The radiated spurious emissions limit shall be as stated in EN 300 390-1 [4], subclause 5.1.4 table 2.

4.2.4.3 Conformance

Conformance tests as defined in subclause 5.2.4 shall be carried out.

4.2.5 Transmitter attack time

4.2.5.1 Definition

The transmitter attack time is defined in EN 300 390-1 [4], subclause 8.5.1.

4.2.5.2 Limit

The transmitter attack time limit shall be as stated in EN 300 390-1 [4], subclause 5.1.5.

4.2.5.3 Conformance

Conformance tests as defined in subclause 5.2.5 shall be carried out.

4.2.6 Transmitter release time

4.2.6.1 Definition

The transient periods are defined in EN 300 390-1 [4], subclause 8.6.1.

4.2.6.2 Limit

The transient periods limit shall be as stated in EN 300 390-1 [4], subclause 5.1.6.

4.2.6.3 Conformance

Conformance tests as defined in subclause 5.2.6 shall be carried out.

4.2.7 Transient frequency behaviour of the transmitter

4.2.7.1 Definition

The transient frequency behaviour of the transmitter is defined in EN 300 390-1 [4], subclause 8.7.1.

4.2.7.2 Limit

The transient frequency behaviour of the transmitter limit shall be as stated in EN 300 390-1 [4], subclauses 5.1.7.1 and 5.1.7.2.

4.2.7.3 Conformance

Conformance tests as defined in subclause 5.2.7 shall be carried out.

4.2.8 Average usable sensitivity

4.2.8.1 Definition

The average usable sensitivity is defined in EN 300 390-1 [4], subclause 9.1.1.

4.2.8.2 Limit

The average usable sensitivity limit shall be as stated in EN 300 390-1 [4], subclause 5.2.1 table 3(a) and table 3(b).

4.2.8.3 Conformance

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

4.2.9 Co-channel rejection

4.2.9.1 Definition

The co-channel rejection is defined in EN 300 390-1 [4], subclause 9.3.1.

4.2.9.2 Limit

The co-channel rejection limit shall be as stated in EN 300 390-1 [4], subclause 5.2.3.

4.2.9.3 Conformance

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

4.2.10 Adjacent channel selectivity

4.2.10.1 Definition

The adjacent channel selectivity is defined in EN 300 390-1 [4], subclause 9.4.1.

4.2.10.2 Limit

The adjacent channel selectivity limit shall be as stated in EN 300 390-1 [4], subclause 5.2.4 table 4.

4.2.10.3 Conformance

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

4.2.11 Spurious response rejection

4.2.11.1 Definition

The spurious response rejection is defined in EN 300 390-1 [4], subclause 9.5.1.

4.2.11.2 Limit

The spurious response rejection limit shall be as stated in EN 300 390-1 [4], subclause 5.2.5.

4.2.11.3 Conformance

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

4.2.12 Intermodulation response rejection

4.2.12.1 Definition

The intermodulation response rejection is defined in EN 300 390-1 [4], subclause 9.6.1.

4.2.12.2 Limit

The intermodulation response rejection limit shall be as stated in EN 300 390-1 [4], subclause 5.2.6.

4.2.12.3 Conformance

Conformance tests as defined in subclause 5.3.6 may be carried out.

4.2.13 Blocking or desensitization

4.2.13.1 Definition

The blocking or desensitization is defined in EN 300 390-1 [4], subclause 9.7.1.

4.2.13.2 Limit

The blocking or desensitization limit shall be as stated in EN 300 390-1 [4], subclause 5.2.7.

4.2.13.3 Conformance

Conformance tests as defined in subclause 5.3.7 may be carried out.

4.2.14 Receiver spurious radiations

4.2.14.1 Definition

The receiver spurious radiations are defined in EN 300 390-1 [4], subclause 9.8.1.

4.2.14.2 Limit

The receiver spurious radiations limit shall be as stated in EN 300 390-1 [4], subclause 5.2.8 table 5.

4.2.14.3 Conformance

Conformance tests as defined in subclause 5.3.8 may be carried out.

5 Testing for compliance with technical requirements

5.1 Test conditions, power supply and ambient temperatures

Conformity tests shall be made under normal test conditions, and also, where stated in EN 300 390-1 [4], under extreme test conditions.

The test conditions and procedures shall be as specified in EN 300 390-1 [4] subclauses 6.2, 6.3, 6.4 and 6.5.

5.2 Essential radio test suites

5.2.1 Frequency error

The test specified in EN 300 390-1 [4], subclause 8.1.2 shall be carried out. The results obtained shall be compared to the limits in subclause 4.2.1.2 in order to prove compliance with the requirement.

5.2.2 Effective radiated power

The tests specified in EN 300 390-1 [4], subclause 8.2.2 shall be carried out. The results obtained shall be compared to the limits in subclause 4.2.2.2 in order to prove compliance with the requirement.

5.2.3 Adjacent channel power

The tests specified in EN 300 390-1 [4], subclause 8.3.2 shall be carried out. The results obtained shall be compared to the limits in subclause 4.2.3.2 in order to prove compliance with the requirement.

5.2.4 Radiated spurious emissions

The tests specified in EN 300 390-1 [4] subclause 8.4.2 shall be carried out. The results obtained shall be compared to the limits in subclause 4.2.4.2 in order to prove compliance with the requirement.

5.2.5 Transmitter attack time

The tests specified in EN 300 390-1 [4], subclause 8.5.2 shall be carried out. The results obtained shall be compared to the limits in subclause 4.2.5.2 in order to prove compliance with the requirement.

5.2.6 Transmitter release time

The tests specified in EN 300 390-1 [4], subclause 8.6.2 shall be carried out. The results obtained shall be compared to the limits in subclause 4.2.6.2 in order to prove compliance with the requirement.

5.2.7 Transient frequency behaviour of the transmitter

The tests specified in EN 300 390-1 [4], subclause 8.7.3 shall be carried out. The results obtained shall be compared to the limits in subclause 4.2.7.2 in order to prove compliance with the requirement.

5.3 Other test specifications

5.3.1 General

The requirements in subclauses 4.2.8 to 4.2.14 inclusive have been set on the assumption that the test specifications in subclauses 5.3.2 to 5.3.8 will be used to verify the performance of the equipment.

5.3.2 Receiver sensitivity

The test specified in EN 300 390-1 [4], subclauses 9.1.2 and 9.1.3 or subclauses 9.1.4 and 9.1.5 shall be carried out. The results obtained shall be compared to the limits in subclause 4.2.8.2 in order to prove compliance with the requirement.

5.3.3 Co-channel rejection

The test specified in EN 300 390-1 [4], subclause 9.3.2 or 9.3.3 shall be carried out. The results obtained shall be compared to the limits in subclause 4.2.9.2 in order to prove compliance with the requirement.

5.3.4 Adjacent channel selectivity

The test specified in EN 300 390-1 [4], subclause 9.4.2 or 9.4.3 shall be carried out. The results obtained shall be compared to the limits in subclause 4.2.10.2 in order to prove compliance with the requirement.

5.3.5 Spurious response rejection

The test specified in EN 300 390-1 [4], subclauses 9.5.2, 9.5.3, 9.5.4 and 9.5.6 or subclauses 9.5.2, 9.5.3, 9.5.5 and 9.5.7 shall be carried out. The results obtained shall be compared to the limits in subclause 4.2.11.2 in order to prove compliance with the requirement.

5.3.6 Intermodulation response rejection

The test specified in EN 300 390-1 [4], subclause 9.6.2 or 9.6.3 shall be carried out. The results obtained shall be compared to the limits in subclause 4.2.12.2 in order to prove compliance with the requirement.

5.3.7 Blocking or desensitization

The test specified in EN 300 390-1 [4], subclause 9.7.2 or 9.7.3 shall be carried out. The results obtained shall be compared to the limits in subclause 4.2.13.2 in order to prove compliance with the requirement.

5.3.8 Receiver spurious radiations

The test specified in EN 300 390-1 [4], subclause 9.8.2 shall be carried out. The results obtained shall be compared to the limits in subclause 4.2.14.2 in order to prove compliance with the requirement.

Annex A (normative): The EN Requirements Table (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 300 390-2				Comment
No.	**Reference**	**EN-R (note)**	**Status**			
1	4.2.1	Frequency error	M			
2	4.2.2	Effective radiated power	M			
3	4.2.3	Adjacent channel power	M			
4	4.2.4	Radiated spurious emissions	M			
5	4.2.5	Transmitter attack time	M			
6	4.2.6	Transmitter release time	M			
7	4.2.7	Transient frequency behaviour of the transmitter	M			
8	4.2.8	Receiver sensitivity	M			
9	4.2.9	Co-channel rejection	M			
10	4.2.10	Adjacent channel selectivity	M			
11	4.2.11	Spurious response rejection	M			
12	4.2.12	Intermodulation response rejection	M			
13	4.2.13	Blocking or desensitization	M			
14	4.2.14	Receiver spurious radiations	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.

History

Document history		
V1.1.1	March 2000	One-step Approval Procedure OAP 20000721: 2000-03-22 to 2000-07-21
V1.1.1	September 2000	Publication