

Final draft **ETSI EN 300 718-2** V1.1.1 (2001-01)

Candidate Harmonized European Standard (Telecommunications series)

**Electromagnetic compatibility
and Radio spectrum Matters (ERM);
Avalanche Beacons;
Transmitter-receiver systems;
Part 2: Harmonized EN covering essential requirements
of article 3.2 of the R&TTE Directive**



Reference

REN/ERM-RP08-0409-2

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Radio, regulation, safety, SAR, testing

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Pursuant to the ETSI IPR Policy, no investigation, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

Foreword

This Candidate Harmonized European Standard (Telecommunications series) 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 is part 2 of a multi-part deliverable covering Avalanche Beacons; transmitter-receiver systems, as identified below:

- Part 1: "Technical characteristics and test methods";
- Part 2: "Harmonized EN covering essential requirements of article 3.2 of the R&TTE Directive";**
- Part 3: "Harmonized EN covering essential requirements of article 3.3e 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 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").

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

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.

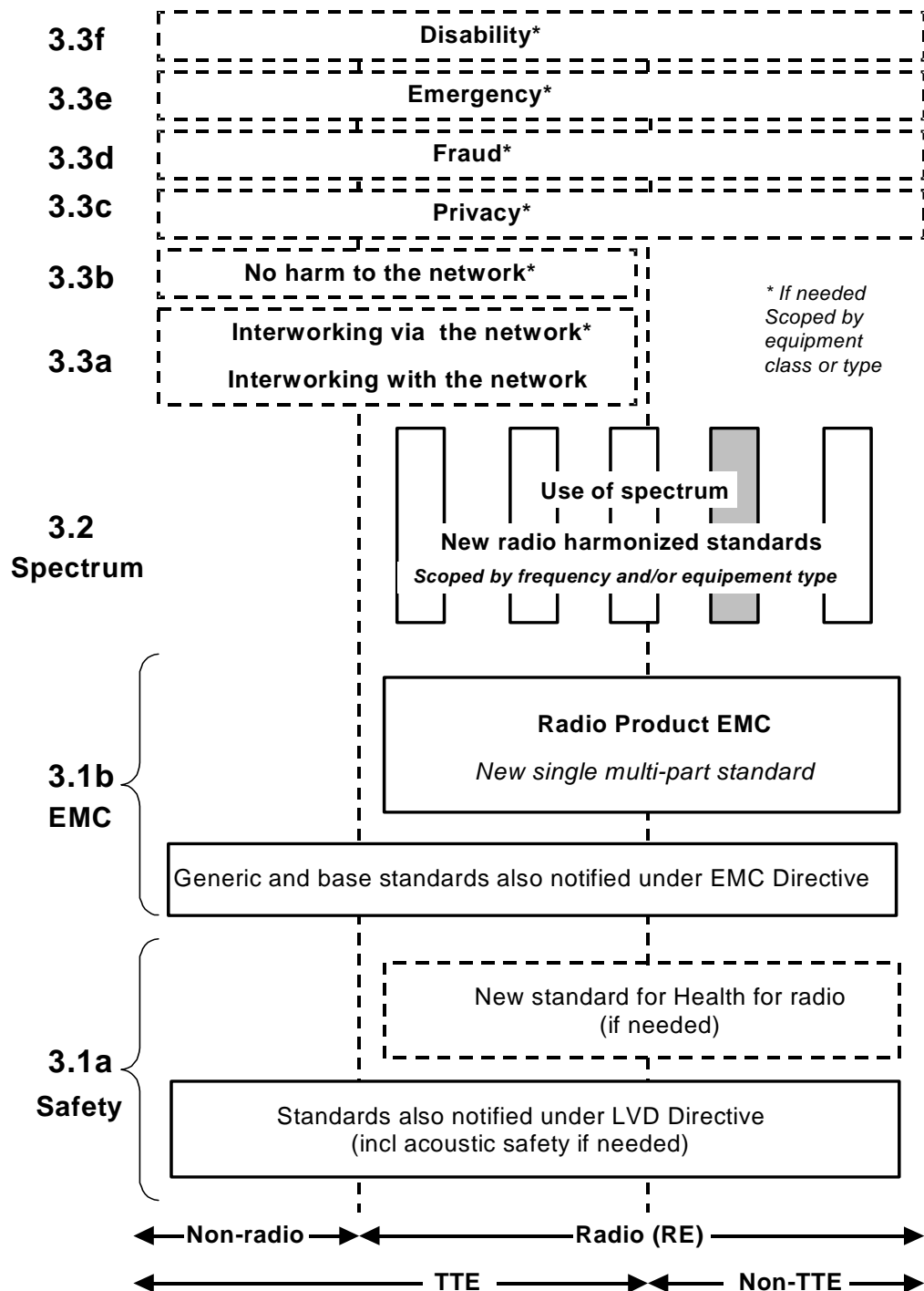


Figure 1: Modular structure for the various standards used under the R&TTE Directive

The left hand edge of the figure shows the different clauses of article 3 of the Directive.

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 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 3.1b, the diagram shows the new single multi-part product EMC standard for radio, and the existing collection of generic and base standards currently used under the EMC Directive. The parts of the present document will become available in the second half of 2000, and the existing separate EMC standards will be used until it is available.

For article 3.1a the diagram shows the existing safety standards currently used under the LVD Directive and the possibility of a new standard on health relating to radio emissions.

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 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 applies to requirements for avalanche beacons. Avalanche beacons are portable radio systems used for locating avalanche victims, for the purpose of direct rescue, i.e. for rescue by comrades not buried by the avalanche. The present document is applicable for avalanche beacons operating at a frequency of 457 kHz. 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 ENs (e.g. EN 300 718-3 [5]) 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 ETSI web site at <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 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 (R&TTE Directive).
- [2] ETSI EN 300 718-1 (V1.2.1, 2001): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Avalanche Beacons; Transmitter-receiver systems; Part 1: Technical characteristics and test methods".
- [3] ETSI ETR 028 (Edition 2, 1994): "Radio Equipment and Systems (RES); Uncertainties in the measurement of mobile radio equipment characteristics".
- [4] ITU Radio Regulations (1998), Appendix S1: "Classification of emissions and necessary bandwidth".
- [5] ETSI EN 300 718-3 (V1.1.1, 2001): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Avalanche Beacons; Transmitter-receiver systems; Part 3: Harmonized EN covering essential requirements of article 3.3e of the R&TTE Directive".

3 Definitions, abbreviations and symbols

3.1 Definitions

For the purposes of the present document, the terms and definitions given in the R&TTE Directive [1], and the following apply:

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

H-field: magnetic component of the field measured as current per unit length

3.2 Abbreviations

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

EN	European Standard
R&TTE	Radio and Telecommunications Terminal Equipment
RF	Radio Frequency

3.3 Symbols

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

A1A	Class of emission (ITU Radio Regulations [4])
f	Frequency
H	Magnetic field strength

4 Technical conformance 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.

(Necessary environmental conditions are validated under article 3.3e and so are permitted in EN 300 718-3 [5], clause 4.1.1) but as they are outside the scope of article 3.2 should not be in the present document (modularity principle)).

4.2 Operating frequency

The operating frequency shall be as stated in EN 300 718-1 [2] clause 4.2.8.

4.3 Modulation and carrier keying

4.3.1 Definition

This shall be as defined in EN 300 718-1 [2] clause 8.1.1

4.3.2 Limits

The modulation and carrier keying shall be as stated in EN 300 718-1 [2] clause 8.1.3.

4.3.3 Conformance

Conformance tests as defined in EN 300 718-1 [2] clause 8.1.2 shall be carried out.

4.4 Frequency error

4.4.1 Definition

This shall be as defined in EN 300 718-1 [2] clause 8.2.1

4.4.2 Limits

The transmitter frequency error limit shall be as stated in EN 300 718-1 [2] clause 8.2.3.

4.4.3 Conformance

Conformance tests as defined in EN 300 718-1 [2] clause 8.2.2 shall be carried out.

4.5 Maximum output field strength (H-field)

4.5.1 Definition

This shall be as defined in EN 300 718-1 [2] clause 8.3.1.

4.5.2 Limits

The maximum transmitter output field strength shall be as stated in EN 300 718-1 [2] clause 8.3.3.2.

4.5.3 Conformance

Conformance tests as defined in EN 300 718-1 [2] clause 8.3.2 shall be carried out.

4.6 Transmitter spurious emissions

4.6.1 Definition

This shall be as defined in EN 300 718-1 [2] clause 8.4.1.

4.6.2 Radiated H-field

4.6.2.1 Limits

This shall be as defined in EN 300 718-1 [2] clause 8.4.2.2.

4.6.2.2 Conformance

Conformance tests as defined in EN 300 718-1 [2] clause 8.4.2.1 shall be carried out.

4.6.3 Effective radiated power

4.6.3.1 Limits

This shall be as defined in EN 300 718-1 [2] clause 8.4.3.2.

4.6.3.2 Conformance

Conformance tests as defined in EN 300 718-1 [2] clause 8.4.3.1 shall be carried out.

4.7 Receiver spurious emissions

4.7.1 Definition

This shall be as defined in EN 300 718-1 [2] clause 9.3.1.

4.7.2 Radiated H-field

4.7.2.1 Limits

This shall be as defined in EN 300 718-1 [2] clause 9.3.2.2.

4.7.2.2 Conformance

Conformance tests as defined in EN 300 718-1 [2] clause 9.3.2.1 shall be carried out.

4.7.3 Effective radiated power

4.7.3.1 Limits

This shall be as defined in EN 300 718-1 [2] clause 9.3.3.2.

4.7.3.2 Conformance

Conformance tests as defined in EN 300 718-1 [2] clause 9.3.3.1 shall be carried out.

5 Conditions for compliance with the requirements

5.1 General

These shall be as described in EN 300 718-1 [2] clauses 6.1 to 6.4.

5.1.1 Environment

The normal and extreme test conditions shall be as specified in EN 300 718-1 [2] clauses 5.1 to 5.4.

Tests defined in the present document shall be carried out at representative points within the boundary limits of the declared operational environmental profile.

Where technical performance varies subject to environmental conditions, tests shall be carried out under a sufficient variety of environmental conditions (within the boundary limits of the declared operational environmental profile) to give confidence of compliance for the affected technical requirements.

5.1.2 Accessories

Where a unit of equipment provides a facility which is additional to requirements of the present document, the operation or malfunction of such an additional facility shall not prevent the avalanche beacons conforming fully to the requirements of the present document during normal combined operation.

6 Measurement uncertainties

The accumulated measurement uncertainties of the test system in use for the parameters to be measured should not exceed those given in table 1. This is in order to ensure that the measurements remain within an acceptable uncertainty.

Table 1: Parameter Uncertainty

Parameter	Maximum uncertainty
RF frequency	$\pm 1 \times 10^{-6}$
Radiated emission of transmitter, valid up to 1 GHz (Substitution method)	± 2 dB
Radiated emission of transmitter, valid up to 1 GHz (Direct measurement, using calibrated antennas)	± 6 dB
Temperature	$\pm 1^{\circ}\text{C}$
Humidity	± 5 %
Transmitted H field at a distance of 10 m	$\pm 0,1 \mu\text{A/m}$
carrier keying times	± 3 ms
NOTE: Where applicable for the test methods according to the present document the uncertainty figures are valid to a confidence level of 95 % calculated according to the methods described in ETR 028 [3].	

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

- 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 [3] and shall correspond to an expansion factor (coverage factor) $k = 1,96$ of $k = 2$ (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 is based on such expansion factors.

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.

The EN-RT is placed in an annex of the EN in order that it may be photocopied and used as a proforma.

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

EN Reference		EN 300 718-2 (the present document)			Comment
No.	Reference	EN-R (Note)	Status		
1	4.1	Operating frequency	M		
2	4.2	Modulation and carrier keying	M		
3	4.3	Frequency error	M		
4	4.4	Maximum output field strength	M		
5	4.5	Transmitter spurious emissions	M		
6	4.6	Receiver spurious emissions	M		

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

Key to columns:

No table entry number;

Reference clause 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	January 2001	One-step Approval Procedure	OAP 20010518: 2001-01-17 to 2001-05-18