



**Electromagnetic compatibility and
Radio spectrum Matters (ERM);
Maritime Personal Homing Beacon
intended for use on the frequency 121,5 MHz for
search and rescue purposes only;
Part 2: Harmonized EN covering the essential requirements of
article 3.2 of the R&TTE Directive**

Reference

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Contents

Intellectual Property Rights	5
Foreword.....	5
1 Scope	6
2 References	6
2.1 Normative references	6
2.2 Informative references.....	6
3 Definitions and abbreviations.....	7
3.1 Definitions.....	7
3.2 Abbreviations	7
4 Technical requirements specifications	7
4.1 Environmental profile.....	7
4.2 Conformance requirements	7
4.2.1 Transmitter frequency error	7
4.2.1.1 Definition	7
4.2.1.2 Limit.....	7
4.2.1.3 Conformance.....	7
4.2.2 Modulation characteristics	8
4.2.2.1 Definition	8
4.2.2.2 Limit.....	8
4.2.2.3 Conformance.....	8
4.2.3 Audio sweep characteristics.....	8
4.2.3.1 Definition	8
4.2.3.2 Limit.....	8
4.2.3.3 Conformance.....	8
4.2.4 Spectral carrier power ratio.....	8
4.2.4.1 Definition	8
4.2.4.2 Limit.....	8
4.2.4.3 Conformance.....	8
4.2.5 Maximum Effective Radiated Peak Envelope Power (ERPEP).....	8
4.2.5.1 Definition	8
4.2.5.2 Limit.....	8
4.2.5.3 Conformance.....	8
4.2.6 Effective Radiated Power during CW modulation (ERP(CW)).....	9
4.2.6.1 Definition	9
4.2.6.2 Limit.....	9
4.2.6.3 Conformance.....	9
4.2.7 Transmitter spectrum mask.....	9
4.2.7.1 Definition	9
4.2.7.2 Limit.....	9
4.2.7.3 Conformance.....	9
4.2.8 Radiation produced by operation of the test facility	9
4.2.8.1 Definition	9
4.2.8.2 Limit.....	9
4.2.8.3 Conformance.....	9
4.2.9 Spurious emissions	9
4.2.9.1 Definition	9
4.2.9.2 Limit.....	9
4.2.9.3 Conformance.....	9
5 Testing for compliance with technical requirements.....	10
5.1 Test conditions, power supply and ambient temperatures	10
5.2 Interpretation of the measurement results	10
5.3 Essential radio test suites.....	10
5.3.1 Transmitter frequency error	10

5.3.2	Modulation characteristics	10
5.3.3	Audio sweep characteristics.....	10
5.3.4	Spectral carrier power ratio.....	11
5.3.5	Maximum Effective Radiated Peak Envelope Power (ERPEP).....	11
5.3.6	Effective Radiated Power during CW modulation (ERP(CW)).....	11
5.3.7	Transmitter spectrum mask.....	11
5.3.8	Radiation produced by operation of the test facility	11
5.3.9	Spurious emissions	11
5.4	Other test specifications	11
Annex A (normative):	HS Requirements and conformance Test specifications Table (HS-RTT).....	12
History		14

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Foreword

This Harmonized European Standard (EN) 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 mandate M/284 issued from the European Commission under Directive 98/34/EC [i.2] as amended by Directive 98/48/EC [i.3].

The title and reference to the present document are intended to be included in the publication in the Official Journal of the European Union of titles and references of Harmonized Standard under the Directive 1999/5/EC [i.1].

See article 5.1 of Directive 1999/5/EC [i.1] for information on presumption of conformity and Harmonized Standards or parts thereof the references of which have been published in the Official Journal of the European Union.

The requirements relevant to Directive 1999/5/EC [i.1] are summarized in annex A.

The present document is part 2 of a multi-part deliverable covering the Electromagnetic compatibility and Radio spectrum Matters (ERM); Maritime Personal Homing Beacon intended for use on the frequency 121,5 MHz (radio beacons) as identified below:

Part 1: "Technical characteristics and methods of measurement";

Part 2: "Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive";

Part 3: "Harmonized EN covering the essential requirements of article 3.3(e) of the R&TTE Directive".

National transposition dates	
Date of adoption of this EN:	2 July 2013
Date of latest announcement of this EN (doa):	31 October 2013
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	30 April 2014
Date of withdrawal of any conflicting National Standard (dow):	30 April 2015

1 Scope

The present document states the minimum technical characteristics and methods of measurement required for Maritime Personal Homing Beacon intended for use on the frequency 121,5 MHz for search and rescue purposes only.

The present document also specifies technical characteristics, methods of measurement and required test results.

2 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 reference document (including any amendments) applies.

Referenced documents which are not found to be publicly available in the expected location might be found at <http://docbox.etsi.org/Reference>.

NOTE: While any hyperlinks included in this clause were valid at the time of publication ETSI cannot guarantee their long term validity.

2.1 Normative references

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

- [1] ETSI EN 302 961-1 (V1.2.1) (07-2013): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Maritime Personal Homing Beacon intended for use on the frequency 121,5 MHz for search and rescue purposes only; Part 1: Technical characteristics and methods of measurement".
- [2] ETSI TR 100 028 (all parts) (V1.4.1) (12-2001): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics".

2.2 Informative references

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 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).
- [i.2] 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.
- [i.3] Directive 98/48/EC of the European Parliament and of the Council of 20 July 1998 amending Directive 98/34/EC laying down a procedure for the provision of information in the field of technical standards and regulations.

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in the R&TTE Directive [i.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

supplier: entity referred to in the R&TTE Directive [i.1] responsible for the placing on the market of an equipment within the scope of the Directive

3.2 Abbreviations

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

CW	Carrier Wave
ERP	Effective Radiated Power
ERPEP	Effective Radiated Peak Envelope Power
RF	Radio Frequency

4 Technical requirements specifications

4.1 Environmental profile

Tests defined in the present document shall be carried out at representative points within the boundary limits of the declared operational environmental profile which, as a minimum, shall be that specified in the test conditions contained in the present document.

As technical performance varies subject to environmental conditions, tests shall be carried out under a sufficient variety of environmental conditions as specified in the present document to give confidence of compliance for the affected technical requirements.

4.2 Conformance requirements

4.2.1 Transmitter frequency error

4.2.1.1 Definition

The transmitter frequency error shall be as defined in EN 302 961-1 [1], clause 8.1.1.

4.2.1.2 Limit

The transmitter frequency error limit shall be as stated in EN 302 961-1 [1], clause 8.1.3.

4.2.1.3 Conformance

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

4.2.2 Modulation characteristics

4.2.2.1 Definition

The modulation characteristics shall be as defined in EN 302 961-1 [1], clauses 8.2.1.1, 8.2.2.1 and 8.2.3.1.

4.2.2.2 Limit

The modulation characteristics limits shall be as stated in EN 302 961-1 [1], clause 8.2.5.

4.2.2.3 Conformance

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

4.2.3 Audio sweep characteristics

4.2.3.1 Definition

The audio sweep characteristics shall be as defined in EN 302 961-1 [1], clauses 8.2.6.1 and 8.2.6.2.

4.2.3.2 Limit

The audio sweep characteristics limit shall be as stated in EN 302 961-1 [1], clause 8.2.6.4.

4.2.3.3 Conformance

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

4.2.4 Spectral carrier power ratio

4.2.4.1 Definition

The spectral carrier power ratio shall be as defined in EN 302 961-1 [1], clause 8.3.1.

4.2.4.2 Limit

The spectral carrier power ratio limit shall be as stated in EN 302 961-1 [1], clause 8.3.3.

4.2.4.3 Conformance

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

4.2.5 Maximum Effective Radiated Peak Envelope Power (ERPEP)

4.2.5.1 Definition

The maximum effective radiated peak envelope power shall be as defined in EN 302 961-1 [1], clause 8.4.1.

4.2.5.2 Limit

The maximum effective radiated peak envelope power limit shall be as stated in EN 302 961-1 [1], clause 8.4.4.

4.2.5.3 Conformance

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

4.2.6 Effective Radiated Power during CW modulation (ERP(CW))

4.2.6.1 Definition

The effective radiated power during CW modulation shall be as defined in EN 302 961-1 [1], clause 8.5.1.

4.2.6.2 Limit

The effective radiated power during CW modulation limit shall be as stated in EN 302 961-1 [1], clause 8.5.3.

4.2.6.3 Conformance

Conformance tests as defined in clause 5.3.6 shall be carried out.

4.2.7 Transmitter spectrum mask

4.2.7.1 Definition

The transmitter spectrum mask shall be as defined in EN 302 961-1 [1], clause 8.6.1.

4.2.7.2 Limit

The transmitter spectrum mask limit shall be as stated in EN 302 961-1 [1], clause 8.6.3.

4.2.7.3 Conformance

Conformance tests as defined in clause 5.3.7 shall be carried out.

4.2.8 Radiation produced by operation of the test facility

4.2.8.1 Definition

The radiation produced by operation of the test facility shall be as defined in EN 302 961-1 [1], clause 8.7.1.

4.2.8.2 Limit

The radiation produced by operation of the test facility limit shall be as stated in EN 302 961-1 [1], clause 8.7.3.

4.2.8.3 Conformance

Conformance tests as defined in clause 5.3.8 shall be carried out.

4.2.9 Spurious emissions

4.2.9.1 Definition

The spurious emissions are defined in EN 302 961-1 [1], clause 8.8.1.

4.2.9.2 Limit

The spurious emissions limit shall be as stated in EN 302 961-1 [1], clause 8.8.3.

4.2.9.3 Conformance

Conformance tests as defined in clause 5.3.9 shall be carried out.

5 Testing for compliance with technical requirements

5.1 Test conditions, power supply and ambient temperatures

These shall be as stated in EN 302 961-1 [1], clauses 6.1 and 6.2 and clauses 6.4 to 6.6.

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 TR 100 028 [2] 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 is based on such expansion factors.

Table 1: Absolute measurement uncertainties: maximum values

Parameter	Maximum uncertainty
RF frequency	$\pm 1 \times 10^{-7}$
RF power	$\pm 0,75$ dB
Sweep time	± 5 %
Conducted spurious emission of transmitter	± 4 dB
Radiated emission of transmitter	± 6 dB

5.3 Essential radio test suites

5.3.1 Transmitter frequency error

The test specified in EN 302 961-1 [1], clause 8.1.2 shall be carried out. The results obtained shall be compared to the limits in clause 4.2.1.2 in order to prove compliance with the requirement.

5.3.2 Modulation characteristics

The test specified in EN 302 961-1 [1], clause 8.2.4 shall be carried out. The results obtained shall be compared to the limits in clause 4.2.2.2 in order to prove compliance with the requirement.

5.3.3 Audio sweep characteristics

The tests specified in EN 302 961-1 [1], clause 8.2.6.3 shall be carried out. The results obtained shall be compared to the limits in clause 4.2.3.2 in order to prove compliance with the requirement.

5.3.4 Spectral carrier power ratio

The tests specified in EN 302 961-1 [1], clause 8.3.2 shall be carried out. The results obtained shall be compared to the limits in clause 4.2.4.2 in order to prove compliance with the requirement.

5.3.5 Maximum Effective Radiated Peak Envelope Power (ERPEP)

The tests specified in EN 302 961-1 [1], clauses 8.4.2 and 8.4.3 shall be carried out. The results obtained shall be compared to the limits in clause 4.2.5.2 in order to prove compliance with the requirement.

5.3.6 Effective Radiated Power during CW modulation (ERP(CW))

The test specified in EN 302 961-1 [1], clause 8.5.2 shall be carried out. The results obtained shall be compared to the limits in clause 4.2.6.2 in order to prove compliance with the requirement.

5.3.7 Transmitter spectrum mask

The test specified in EN 302 961-1 [1], clause 8.6.2 shall be carried out. The results obtained shall be compared to the limits in clause 4.2.7.2 in order to prove compliance with the requirement.

5.3.8 Radiation produced by operation of the test facility

The test specified in EN 302 961-1 [1], clause 8.7.2 shall be carried out. The results obtained shall be compared to the limits in clause 4.2.8.2 in order to prove compliance with the requirement.

5.3.9 Spurious emissions

The test specified in EN 302 961-1 [1], clause 8.8.2 shall be carried out. The results obtained shall be compared to the limits in clause 4.2.9.2 in order to prove compliance with the requirement.

5.4 Other test specifications

None.

Annex A (normative): HS Requirements and conformance Test specifications Table (HS-RTT)

The HS Requirements and conformance Test specifications Table (HS-RTT) in table A.1 serves a number of purposes, as follows:

- it provides a statement of all the requirements in words and by cross reference to (a) specific clause(s) in the present document or to (a) specific clause(s) in (a) specific referenced document(s);
- it provides a statement of all the test procedures corresponding to those requirements by cross reference to (a) specific clause(s) in the present document or to (a) specific clause(s) in (a) specific referenced document(s);
- it qualifies each requirement to be either:
 - Unconditional: meaning that the requirement applies in all circumstances; or
 - Conditional: meaning that the requirement is dependant on the manufacturer having chosen to support optional functionality defined within the schedule.
- in the case of Conditional requirements, it associates the requirement with the particular optional service or functionality;
- it qualifies each test procedure to be either:
 - Essential: meaning that it is included with the Essential Radio Test Suite and therefore the requirement shall be demonstrated to be met in accordance with the referenced procedures;
 - Other: meaning that the test procedure is illustrative but other means of demonstrating compliance with the requirement are permitted.

Table A.1: HS Requirements and conformance Test specifications Table (HS-RTT)

Harmonized Standard EN 302 961-2						
The following requirements and test specifications are relevant to the presumption of conformity under the article 3.2 of the R&TTE Directive [i.1]						
Requirement			Requirement Conditionality		Test Specification	
No	Description	Reference: Clause No	U/C	Condition	E/O	Reference: Clause No
1	Transmitter frequency error	4.2.1	U		E	5.3.1
2	Modulation characteristics	4.2.2	U		E	5.3.2
3	Audio sweep characteristics	4.2.3	U		E	5.3.3
4	Spectral carrier power ratio	4.2.4	U		E	5.3.4
5	Maximum effective radiated peak envelope power (ERPEP)	4.2.5	U		E	5.3.5
6	Effective radiated power during CW modulation (ERP(CW))	4.2.6	U		E	5.3.6
7	Transmitter spectrum mask	4.2.7	U		E	5.3.7
8	Radiation produced by operation of the test facility	4.2.8	U		E	5.3.8
9	Spurious emissions	4.2.9	U		E	5.3.9

Key to columns:**Requirement:**

No	A unique identifier for one row of the table which may be used to identify an essential requirement or its test specification.
Description	A textual reference to the requirement.
Clause Number	Identification of clause(s) defining the essential requirement in the present document unless another document is referenced explicitly.

Requirement Conditionality:

U/C	Indicates whether the requirement is to be <i>unconditionally</i> applicable (U) or is <i>conditional</i> upon the suppliers claimed functionality of the equipment (C).
Condition	Explains the conditions when the requirement shall or shall not be applicable for a technical requirement which is classified "conditional".

Test Specification:

E/O	Indicates whether the test specification forms part of the <i>Essential Radio Test Suite</i> (E) or whether it is one of the <i>Other Test Suite</i> (O).
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NOTE: All tests whether "E" or "O" are relevant to the requirements. Rows designated "E" collectively make up the Essential Radio Test Suite; those designated "O" make up the Other Test Suite; for those designated "X" there is no test specified corresponding to the requirement. The completion of all tests classified "E" as specified with satisfactory outcomes is a necessary condition for a presumption of conformity. Compliance with requirements associated with tests classified "O" or "X" is a necessary condition for presumption of conformity, although conformance with the requirement may be claimed by an equivalent test or by manufacturer's assertion supported by appropriate entries in the technical construction file.

Clause Number	Identification of clause(s) defining the test specification in the present, document unless another document is referenced explicitly. Where no test is specified (that is, where the previous field is "X") this field remains blank.
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History

Document history				
V1.0.0	December 2011	Public Enquiry	PE 20120419:	2011-12-21 to 2012-04-19
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