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Candidate Harmonized European Standard (Telecommunications series)

**Electromagnetic compatibility
and Radio spectrum Matters (ERM);
Radiotelephone transmitters and receivers for
the maritime mobile service operating in VHF bands
with the use of 12,5 kHz channels;
Part 2: Harmonized EN covering essential requirements
of article 3.2 of the R&TTE Directive**



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), and is now submitted for the ETSI standards One-step Approval Procedure.

The present document has been produced by ETSI in response to a mandate from the European Commission issued under Council Directive 98/34/EC (as amended) [4] 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").

Technical specifications relevant to Directive 1999/5/EC [1] are given in annex A.

The present document is part 2 of a multi-part deliverable covering the radiotelephone transmitters and receivers for the maritime mobile service operating in VHF bands, as identified below:

- Part 1: "Technical characteristics and methods of measurement";
- 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 3.3 (e) of 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

1 Scope

The present document applies to shipborne Very High Frequency (VHF) transmitters and receivers capable of voice and Digital Selective Calling (DSC), radio equipment.

The present document lays down minimum requirements for VHF radio transmitters and receivers operating in certain frequency bands allocated to the maritime mobile service using both 25 kHz and 12,5 kHz channels, and incorporates the requirements of the relevant recommendations of the International Maritime Organization (IMO).

The present document is intended to cover the provisions of Directive 1999/5/EC [1] (R&TTE Directive) 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 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.

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.

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

- [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 300 162-1 (V1.4.1): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Radiotelephone transmitters and receivers for the maritime mobile service operating in VHF bands; Part 1: Technical characteristics and methods of measurement".
- [3] ETSI TR 100 028-1 (V1.4.1): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics; Part 1".
- [4] 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.
- [5] Commission Decision of 4 September 2003 on essential requirements relating to marine radio communication equipment which is intended to be used on non-SOLAS vessels and to participate in the Global Maritime Distress and Safety System (GMDSS) (2004/71/EC).

3 Definitions and abbreviations

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

3.2 Abbreviations

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

DSC	Digital Selective Calling
EMC	Electro-Magnetic Compatibility
LV	Low Voltage
R&TTE	Radio and Telecommunications Terminal Equipment
VHF	Very High 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. These environmental conditions represent those required by Article 2 of EC decision 2004/71/EC [5] (which shall also be within the boundary limits of the declared operational environmental profile).

4.2 Conformance requirements

4.2.1 Frequency error

4.2.1.1 Definition

The frequency error is defined in EN 300 162-1 [2], clause 8.1.1.

4.2.1.2 Limit

The frequency error limit shall be as stated in EN 300 162-1 [2], 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 Carrier power

4.2.2.1 Definition

The carrier power is defined in EN 300 162-1 [2], clause 8.2.1.

4.2.2.2 Limit

The carrier power limit shall be as stated in EN 300 162-1 [2], clause 8.2.3.

4.2.2.3 Conformance

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

4.2.3 Frequency deviation

4.2.3.1 Definition

The frequency deviation is defined in EN 300 162-1 [2], clause 8.3.1.

4.2.3.2 Limit

The frequency deviation limit shall be as stated in EN 300 162-1 [2], clauses 8.3.2.2 and 8.3.3.2.

4.2.3.3 Conformance

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

4.2.4 Adjacent channel power

4.2.4.1 Definition

The adjacent channel power is defined in EN 300 162-1 [2], clause 8.7.1.

4.2.4.2 Limit

The adjacent channel power limit shall be as stated in EN 300 162-1 [2], clause 8.7.3.

4.2.4.3 Conformance

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

4.2.5 Conducted spurious emissions conveyed to the antenna

4.2.5.1 Definition

The conducted spurious emissions conveyed to the antenna is defined in EN 300 162-1 [2], clause 8.8.1.

4.2.5.2 Limit

The conducted spurious emissions conveyed to the antenna limit shall be as stated in EN 300 162-1 [2], clause 8.8.3.

4.2.5.3 Conformance

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

4.2.6 Cabinet radiation and conducted spurious emissions other than those conveyed to the antenna

4.2.6.1 Definition

The cabinet radiation and conducted spurious emissions other than those conveyed to the antenna is defined in EN 300 162-1 [2], clause 8.9.1.

4.2.6.2 Limit

The cabinet radiation and conducted spurious emissions other than those conveyed to the antenna limit shall be as stated in EN 300 162-1 [2], clause 8.9.3.

4.2.6.3 Conformance

Conformance tests as defined in clause 5.3.6 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 300 162-1 [2], clause 8.14.1.

4.2.7.2 Limit

The transient frequency behaviour of the transmitter limit shall be as stated in EN 300 162-1 [2], clause 8.14.3.

4.2.7.3 Conformance

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

4.2.8 Maximum usable sensitivity

4.2.8.1 Definition

The maximum usable sensitivity is defined in EN 300 162-1 [2], clause 9.3.1.

4.2.8.2 Limit

The maximum usable sensitivity limit shall be as stated in EN 300 162-1 [2], clause 9.3.3.

4.2.8.3 Conformance

Conformance tests as defined in clause 5.4.2 may be carried out.

4.2.9 Co-channel rejection

4.2.9.1 Definition

The co-channel rejection is defined in EN 300 162-1 [2], clause 9.4.1.

4.2.9.2 Limit

The co-channel rejection limit shall be as stated in EN 300 162-1 [2], clause 9.4.3.

4.2.9.3 Conformance

Conformance tests as defined in clause 5.4.3 may be carried out.

4.2.10 Adjacent channel selectivity

4.2.10.1 Definition

The adjacent channel selectivity is defined in EN 300 162-1 [2], clause 9.5.1.

4.2.10.2 Limit

The adjacent channel selectivity limit shall be as stated in EN 300 162-1 [2], clause 9.5.3.

4.2.10.3 Conformance

Conformance tests as defined in clause 5.4.4 may be carried out.

4.2.11 Spurious response rejection

4.2.11.1 Definition

The spurious response rejection is defined in EN 300 162-1 [2], clause 9.6.1.

4.2.11.2 Limit

The spurious response rejection limit shall be as stated in EN 300 162-1 [2], clause 9.6.3.

4.2.11.3 Conformance

Conformance tests as defined in clause 5.4.5 may be carried out.

4.2.12 Intermodulation response

4.2.12.1 Definition

The intermodulation response is defined in EN 300 162-1 [2], clause 9.7.1.

4.2.12.2 Limit

The intermodulation response limit shall be as stated in EN 300 162-1 [2], clause 9.7.3.

4.2.12.3 Conformance

Conformance tests as defined in clause 5.4.6 may be carried out.

4.2.13 Blocking or desensitization

4.2.13.1 Definition

The blocking or desensitization is defined in EN 300 162-1 [2], clause 9.8.1.

4.2.13.2 Limit

The blocking or desensitization limit shall be as stated in EN 300 162-1 [2], clause 9.8.3.

4.2.13.3 Conformance

Conformance tests as defined in clause 5.4.7 may be carried out.

4.2.14 Receiver conducted spurious emissions

4.2.14.1 Definition

The receiver conducted spurious emissions is defined in EN 300 162-1 [2], clause 9.9.1.

4.2.14.2 Limit

The receiver conducted spurious emissions limit shall be as stated in EN 300 162-1 [2], clause 9.9.3.

4.2.14.3 Conformance

Conformance tests as defined in clause 5.4.8 may be carried out.

4.2.15 Receiver radiated spurious emissions

4.2.15.1 Definition

The receiver radiated spurious emissions is defined in EN 300 162-1 [2], clause 9.10.1.

4.2.15.2 Limit

The receiver radiated spurious emissions limit shall be as stated in EN 300 162-1 [2], clause 9.10.3.

4.2.15.3 Conformance

Conformance tests as defined in clause 5.4.9 may be carried out.

4.2.16 Receiver desensitization with simultaneous transmission and reception (Equipment designed for duplex operation)

4.2.16.1 Definition

The receiver desensitization, with simultaneous transmission and reception, is defined in EN 300 162-1 [2], clause 10.1.1.

4.2.16.2 Limit

The receiver desensitization, with simultaneous transmission and reception, limit shall be as stated in EN 300 162-1 [2], clause 10.1.3.

4.2.16.3 Conformance

Conformance tests as defined in clause 5.4.10 may be carried out.

5 Testing for compliance with technical requirements

5.1 Test conditions, power supply and ambient temperatures

The test conditions and procedures shall be as defined in EN 300 162-1 [2], clauses 6.1 to 6.6 and 6.8 to 6.11.

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 100 028-1 [3] 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
Maximum frequency deviation:	
- within 300 Hz to 6 kHz of modulation frequency	± 5 %
- within 6 kHz to 25 kHz of modulation frequency	± 3 dB
Deviation limitation	± 5 %
Adjacent channel power	± 5 dB
Conducted spurious emission of transmitter	± 4 dB
Audio output power	$\pm 0,5$ dB
Sensitivity at 20 dB SINAD	± 3 dB
Conducted emission of receiver	± 3 dB
Two-signal measurement	± 4 dB
Three-signal measurement	± 3 dB
Radiated emission of transmitter	± 6 dB
Radiated emission of receiver	± 6 dB
Transmitter transient time	± 20 %
Transmitter transient frequency	± 250 Hz
Receiver desensitization (duplex operation)	$\pm 0,5$ dB

5.3 Essential radio test suites

5.3.1 Frequency error

The test specified in EN 300 162-1 [2], 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 Carrier power

The test specified in EN 300 162-1 [2], clause 8.2.2 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 Frequency deviation

The test specified in EN 300 162-1 [2], clauses 8.3.2.1 and 8.3.3.1 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 Adjacent channel power

The test specified in EN 300 162-1 [2], clause 8.7.2 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 Conducted spurious emissions conveyed to the antenna

The test specified in EN 300 162-1 [2], clause 8.8.2 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 Cabinet radiation and conducted spurious emissions other than those conveyed to the antenna

The test specified in EN 300 162-1 [2], clause 8.9.2 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 Transient frequency behaviour of the transmitter

The test specified in EN 300 162-1 [2], clause 8.14.2 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.

5.4 Other test specifications

5.4.1 General

The requirements in clauses 4.2.8 to 4.2.15 inclusive have been set on the assumption that the test specifications in clauses 5.4.2 to 5.4.9 will be used to verify the performance of the equipment.

5.4.2 Maximum usable sensitivity

The test specified in EN 300 162-1 [2], clause 9.3.2 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.

5.4.3 Co-channel rejection

The test specified in EN 300 162-1 [2], clause 9.4.2 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.

5.4.4 Adjacent channel selectivity

The test specified in EN 300 162-1 [2], clause 9.5.2 shall be carried out. The results obtained shall be compared to the limits in clause 4.2.10.2 in order to prove compliance with the requirement.

5.4.5 Spurious response rejection

The test specified in EN 300 162-1 [2], clause 9.6.2 shall be carried out. The results obtained shall be compared to the limits in clause 4.2.11.2 in order to prove compliance with the requirement.

5.4.6 Intermodulation response

The test specified in EN 300 162-1 [2], clause 9.7.2 shall be carried out. The results obtained shall be compared to the limits in clause 4.2.12.2 in order to prove compliance with the requirement.

5.4.7 Blocking or desensitization

The test specified in EN 300 162-1 [2], clause 9.8.2 shall be carried out. The results obtained shall be compared to the limits in clause 4.2.13.2 in order to prove compliance with the requirement.

5.4.8 Receiver conducted spurious emissions

The test specified in EN 300 162-1 [2], clause 9.9.2 shall be carried out. The results obtained shall be compared to the limits in clause 4.2.14.2 in order to prove compliance with the requirement.

5.4.9 Receiver radiated spurious emissions

The test specified in EN 300 162-1 [2], clause 9.10.2 shall be carried out. The results obtained shall be compared to the limits in clause 4.2.15.2 in order to prove compliance with the requirement.

5.4.10 Receiver desensitization with simultaneous transmission and reception (Duplex operation)

The test specified in EN 300 162-1 [2], clause 10.1.2 shall be carried out. The results obtained shall be compared to the limits in clause 4.2.16.2 in order to prove compliance with the requirement.

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

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 HS-RTT proforma in this annex so that it can be used for its intended purposes and may further publish the completed HS-RTT.
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The HS Requirements & conformance Test specifications Table (HS-RTT) in table A.1 below serves a number of purposes, as follows:

- it provides a statement of all the essential requirements in words and by cross reference to a specific clause in the present document or to a specific clause in a specific referenced document;
- it provides a statement of all the test procedure corresponding to those essential requirements by cross reference to specific clause(s) in the present document or to a specific clause(s) in 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 dependent on the supplier 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;
- when the schedule is completed in respect of a particular equipment including the testing outcomes, including a completed version of table A.1 it provides a means to assert the "presumption of conformity" with the HS.

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

Harmonized Standard EN 300 162-2							
The following technical requirements and test specifications are relevant to the presumption of conformity under Article 3.2 of the R&TTE Directive							
Technical Requirement reference			Technical 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	Transmitter carrier power	4.2.2	U		E	5.3.2	
3	Transmitter frequency deviation	4.2.3	U		E	5.3.3	
4	Transmitter adjacent channel power	4.2.4	U		E	5.3.4	
5	Transmitter Conducted spurious emissions conveyed to the antenna	4.2.5	U		E	5.3.5	
6	Transmitter Cabinet radiation and conducted spurious emissions other than those conveyed to the antenna	4.2.6	U		E	5.3.6	
7	Transient frequency behaviour of the transmitter	4.2.7	U		E	5.3.7	
8	Receiver maximum useable sensitivity	4.2.8	U		O	5.4.2	
9	Receiver co-channel rejection	4.2.9	U		O	5.4.3	
10	Receiver adjacent channel selectivity	4.2.10	U		O	5.4.4	
11	Receiver spurious response rejection	4.2.11	U		O	5.4.5	
12	Receiver inter-modulation response	4.2.12	U		O	5.4.6	
13	Receiver blocking or desensitization	4.2.13	U		O	5.4.7	
14	Receiver spurious emissions at the antenna	4.2.14	U		O	5.4.8	

Harmonized Standard EN 300 162-2							
The following technical requirements and test specifications are relevant to the presumption of conformity under Article 3.2 of the R&TTE Directive							
Technical Requirement reference			Technical Requirement Conditionality		Test Specification		
No	Description	Reference: Clause No	U/C	Condition	E/O	Reference: Clause No	
15	Receiver cabinet radiated spurious emissions	4.2.15	U		O	5.4.9	
16	Receiver desensitization with simultaneous transmission and reception (Duplex operation)	4.2.16	U		O	5.4.10	

Key to columns:

Essential 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 Essential Requirement

Reference: Clause Number

Identification of clause(s) defining the essential requirement in the present document unless another document is referenced explicitly

Conditionality:

U/C Indicates whether the requirement is to be *unconditionally* applicable (U) or is *conditional* upon the suppliers claimed functionality of the equipment (C)

Condition Explains the conditions when the requirement shall or shall not be applicable for a requirement which is classified "conditional"

Test Specification:

E/O Indicates whether the test specification forms part of the *Essential Radio Test Suite* (E) or whether it is one of the *Other Test Suite* (O)

NOTE: All tests whether "E" or "O" are relevant to technical 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 technical requirements. All tests classified "E" shall be performed as specified with satisfactory outcomes is a necessary condition for a presumption of conformity. Technical requirements associated with tests classified "O" or "X" must be complied with as 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.

Reference: 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

Annex B (informative): The EN title in the official languages

Language	EN title
Czech	
Danish	
Dutch	
English	Electromagnetic compatibility and Radio spectrum Matters (ERM); Radiotelephone transmitters and receivers for the maritime mobile service operating in VHF bands with the use of 12,5 kHz channels; Part 2: Harmonized EN covering essential requirements of article 3.2 of the R&TTE Directive
Estonian	
Finnish	
French	
German	
Greek	
Hungarian	
Icelandic	
Italian	
Latvian	
Lithuanian	
Maltese	
Norwegian	
Polish	
Portuguese	
Slovak	
Slovenian	
Spanish	
Swedish	

Annex C (informative): Bibliography

- 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).
- Council Directive 73/23/EEC of 19 February 1973 on the harmonization of the laws of Member States relating to electrical equipment designed for use within certain voltage limits (LV Directive).

History

Document history		
V1.1.2	December 2000	Publication
V1.2.1	July 2006	One-step Approval Procedure OAP 20061117: 2006-07-19 to 2006-11-17