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Harmonized European Standard (Telecommunications series)

**Electromagnetic compatibility
and Radio spectrum Matters (ERM);
Maritime mobile transmitters and receivers
for use in the MF and HF bands;
Part 3: Harmonized EN covering essential requirements
under article 3.3(e) of the R&TTE Directive;
Equipment with integrated or associated equipment for
Class E Digital Selective Calling (DSC)**

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Foreword

This Harmonized European Standard (Telecommunications series) 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 a mandate from the European Commission issued under Council Directive 98/34/EC (as amended) [i.2] laying down a procedure for the provision of information in the field of technical standards and regulations and following the Commission Decision 2004/71/EC [i.5] of 4 September 2003.

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 [i.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 [i.1] are given in annex A.

The present document is part 3 of a multi-part deliverable covering Maritime mobile transmitters and receivers for use in the MF and HF bands, as identified below:

- Part 1: "Technical characteristics and methods of measurement";
- Part 2: "Harmonized EN covering essential requirements under article 3.2 of the R&TTE Directive";
- Part 3: "Harmonized EN covering essential requirements under article 3.3(e) of the R&TTE Directive; Equipment with integrated or associated equipment for Class E Digital Selective Calling (DSC)".**

National transposition dates	
Date of adoption of this EN:	9 December 2009
Date of latest announcement of this EN (doa):	31 March 2010
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	30 September 2010
Date of withdrawal of any conflicting National Standard (dow):	30 September 2011

1 Scope

The present document applies to radio transmitters and receivers, for use on vessels operating in either the Medium Frequency (MF) 1 606,5 kHz to 4 000 kHz bands only, or in the Medium and High Frequency (MF/HF) 1 606,5 kHz to 27,5 MHz bands allocated in the International Telecommunications Union (ITU) Radio Regulations [1], to the Maritime Mobile Service (MMS).

The present document refers to equipment for one or more of the following:

- Single SideBand (SSB) modulation for telephony transmission and reception (J3E);
- Frequency Shift Keying (FSK) or SSB modulation of a keyed sub-carrier to transmit and receive Digital Selective Calling (DSC) signals.

The present document refers to radio equipment, which is either fitted with an integrated DSC controller or fitted with a dedicated interface for a DSC controller.

The present document is intended to cover the provisions of Directive 1999/5/EC [i.1] (R&TTE Directive) article 3.3 e), which states that radio equipment within the scope of the present document shall be so constructed that: "it supports certain features ensuring access to emergency services".

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 [i.1] will apply to equipment within the scope of the present document.

2 References

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.
- Non-specific reference may be made only to a complete document or a part thereof and only in the following cases:
 - if it is accepted that it will be possible to use all future changes of the referenced document for the purposes of the referring document;
 - for informative references.

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 indispensable for the application of the present document. For dated references, only the edition cited applies. For non-specific references, the latest edition of the referenced document (including any amendments) applies.

- [1] ITU Radio Regulations (2008).
- [2] ETSI EN 300 373-2 (V1.1.2): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Maritime mobile transmitters and receivers for use in the MF and HF bands; Part 2: Harmonized EN covering essential requirements under article 3.2 of the R&TTE Directive".
- [3] ISO 3791 (1976): "Office machines and data processing equipment - Keyboard layouts for numeric applications".

- [4] ETSI EN 300 338-4 (V1.1.1): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Technical characteristics and methods of measurement for equipment for generation, transmission and reception of Digital Selective Calling (DSC) in the maritime MF, MF/HF and/or VHF mobile service; Part 4: Class E DSC".

2.2 Informative references

The following referenced documents are not essential to the use of the present document but they assist the user with regard to a particular subject area. For non-specific references, the latest version of the referenced document (including any amendments) applies.

- [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] ITU-T Recommendation E.161 (2001): "Arrangement of digits, letters and symbols on telephones and other devices that can be used for gaining access to a telephone network".
- [i.4] ETSI TR 100 028: "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics".
- [i.5] Commission Decision 2004/71/EC 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).
- [i.6] CENELEC EN 60945 (2002): "Maritime navigation and radiocommunication equipment and systems - General requirements - Methods of testing and required test results".

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 [i.1] and the following apply:

assigned frequency: centre of the frequency band assigned to a station

carrier frequency: frequency to which the transmitter or receiver is tuned

environmental profile: range of environmental conditions under which equipment complies with the provisions of the present document

rated output power: (of the receiver) rated output power of the receiver is the output power of the receiver as declared by the manufacturer that complies with both the minimum audio power and maximum total harmonic distortion at the same time

standard output power: (of the receiver) is defined as:

- a) 1 mW for earphone reception;
- b) 500 mW for loudspeaker reception;
- c) 0 dBm into 600 Ω for the audio line outputs;

measured across a resistor equal to the nominal value of the load impedance as declared by the manufacturer

3.2 Symbols

For the purposes of the present document, the symbols given in the ITU Radio Regulations [1] and the following apply:

dB	decibel
dBm	dBmilliwatt
dB μ V	dBmicrovolt
F1B	frequency modulation, single channel containing quantized or digital information without the use of a modulating sub-carrier, telegraphy for automatic reception
g	gram
h	hour
Hz	hertz
J2B	SSB, suppressed carrier, single channel containing quantized or digital information with the use of a modulating sub-carrier, telegraphy for automatic reception
J3E	SSB, suppressed carrier, single channel containing analogue information, telephony
k	kilo
kHz	kilohertz
kPa	kilopascal
l	litre
m	meter
MHz	megahertz
min	minute
mm	millimeter
ms	millisecond
mW	milliwatt
NaCl	sodium chloride
Ω	ohm
pF	picofarad
s	second
V	volt
W	watt

3.3 Abbreviations

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

AGC	Automatic Gain Control
DC	Direct Current
DSC	Digital Selective Calling
EMC	ElectroMagnetic Compatibility
emf	electromotive force
EUT	Equipment Under Test
FSK	Frequency Shift Keying
ISO	International Standards Organization
ITU	International Telecommunications Union
MF	Medium Frequency
MF/HF	Medium and High Frequency
MMS	Maritime Mobile Service
PEP	Peak Envelope Power
R&TTE	Radio and Telecommunications Terminal Equipment
RF	Radio Frequency
RMS	Root Mean Square
SINAD	Signal plus Noise plus Distortion to Noise plus Distortion
SNR	Signal-to-Noise Ratio
SSB	Single Side Band

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 General, operational and technical requirements

4.2.1 General

There are no essential test suites for the requirements in clause 4.2. The availability of the specified controls shall be verified by visual inspection.

4.2.2 General requirements

4.2.2.1 Composition

The equipment shall contain either:

- a dedicated watchkeeping receiver for the DSC decoder;
- a DSC encoder; and
- a DSC decoder.

Or:

- a dedicated DSC controller interface.

4.2.2.1.1 Audio frequencies interfaces

The following inputs and outputs applicable to the type of equipment shall be provided:

- a) transmitters:
 - SSB Telephony:
 - 600 Ω earth free audio input;
 - microphone input;
- b) receivers:
 - SSB Telephony:
 - 600 Ω earth free audio output;
 - earphone output;
 - speaker output.

4.2.2.1.2 DSC Interface

If the equipment does not have an integrated DSC controller then, the equipment shall have a dedicated interface for an external DSC controller compliant with EN 300 338-4 [4].

4.2.2.1.3 Digital input panels

Where a digital input panel with the digits "0" to "9" is provided, the digits shall be arranged to conform to ITU-T Recommendation E.161 [i.3]. However, where an alphanumeric keyboard layout is provided, the digits "0" to "9" may, alternatively, be arranged to conform to ISO 3791 [3].

4.2.2.2 Construction

The attention of the manufacturer is drawn to EN 60945 [i.6] which offers guidelines on the construction and ergonomic details for equipment intended to be used on board vessels.

All controls shall be of sufficient size to enable the usual control functions to be easily performed and the number of controls should be the minimum necessary for simple and satisfactory operation.

Adequately detailed operating instructions shall be provided with the equipment.

The equipment shall be capable of operating on single-frequency and two-frequency channels with manual control (simplex).

4.2.2.3 Controls and indicators

4.2.2.3.1 General

All controls shall be easily identified from the position at which the operator operates the equipment.

The number of operational controls, their design and manner of functioning, location, arrangement and size should provide for simple, quick and efficient operation. Controls which are not necessary for normal operation shall not be readily accessible to the operator.

The controls should be arranged in a manner which minimizes the risk of inadvertent operation.

For transmitters it shall be possible to change the transmitter from any class of emission to another for which it is designed to operate by means of not more than one control.

For receivers the class of emission shall be selectable by not more than one control.

Facilities shall be provided to enable the loudspeaker to be switched off when reception is by headphones or telephone handset. Automatic facilities shall be provided to turn off the loudspeaker during duplex operation.

If a device is provided in the receiver to reduce the effects of impulsive noise, a switch shall be provided to disable its function.

4.2.2.3.2 Illumination

Equipment intended to be installed on the navigating bridge of a ship shall be provided with adequate illumination to enable identification of controls and facilitate reading of indicators at all times. Means shall be provided for reducing continuously, to extinction, the output of any light source on the equipment which is capable of interfering with navigation.

All adjustments and controls necessary for switching the transmitter and receiver to operate on the distress and safety channels covered by the equipment shall be clearly marked in order that this operation can be easily performed.

If the accessible controls are located on a separate control panel and if there are two or more control panels, one of the control panels shall have priority over the others. If there are two or more control panels, when any control panel is in use, this shall be clearly indicated on all of the other control panels.