
Elektromagnetna združljivost in zadeve v zvezi z radijskim spektrom (ERM) – Pomorski mobilni oddajniki in sprejemniki za uporabo v radiofrekvenčnih pasovih MF in HF – 1. del: Tehnične karakteristike in merilne metode

Electromagnetic compatibility and Radio spectrum Matters (ERM); Maritime mobile transmitters and receivers for use in the MF and HF bands; Part 1: Technical characteristics and methods of measurement

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Part 1: Technical characteristics and
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Foreword

This European Standard (Telecommunications series) has been produced by ETSI Technical Committee Electromagnetic compatibility and Radio spectrum Matters (ERM).

The present document is part 1, 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".

The present document sets out the minimum requirements for Medium Frequency (MF) and Medium and High Frequency (MF/HF) equipment on board ships, operating in the maritime mobile MF and HF radio services.

Every EN prepared by ETSI is a voluntary standard. The present document contains text concerning conformance testing of the equipment to which it relates. This text should be considered only as guidance and does not make the present document mandatory.

National transposition dates

Date of adoption of this EN:	13 September 2002
Date of latest announcement of this EN (doa):	31 December 2002
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	30 June 2003
Date of withdrawal of any conflicting National Standard (dow):	30 June 2003

1 Scope

The present document states the minimum requirements for radio transmitters and receivers, for use on ships, operating in either the Medium Frequency (MF) only or in the Medium and High Frequency (MF/HF) bands allocated in the International Telecommunications Union (ITU) Radio Regulations [1], to the Maritime Mobile Service (MMS).

The present document includes the International Maritime Organization (IMO) and ITU requirements included in the relevant provisions of the Radio Regulations [1], the International Convention for the Safety Of Life At Sea (SOLAS) [3], the IMO Resolutions A.694(17) [5] and A806 (19) [4] and is primarily intended to specify equipment suitable for fitting to ships subject to the SOLAS convention and complying with the European Marine Equipment Directive [20].

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 in accordance with ITU-R Recommendation M.493-10 [6].

The present document also refers to radio equipment, which is not integrated with the DSC encoder or decoder, but defines the interfaces with such equipment.

NOTE: The requirements for integrated equipment may be found in other relevant ETSs.

The tests in the present document are applicable to receivers for operating on all frequencies in the bands 1 605 kHz to 4 000 kHz or 1 605 kHz to 27,5 MHz as allocated in the Radio Regulations [1], to the MMS.

Other spot frequency receivers should meet all the requirements of the present document and other relevant standards as applicable for the frequencies and modes provided.

If the equipment, or parts of it, are designed in such a manner that they can be used for other categories of maritime radiocommunication (e.g. Morse telegraphy or NBDP (ETS 300 067 [10])), those parts of the equipment should fulfil the relevant requirements of the appropriate standards for the service(s) in question e.g. ETS 300 067 [10].

The EMC parameters defined in the clauses of this standard covering emission tests and immunity test (see clauses 8 and 9) have been selected to ensure an adequate level of compatibility for apparatus in marine environments.

Compliance to the EMC requirements of this standard does not signify compliance to any safety requirements. However, it is the responsibility of the assessor of the equipment to record in their test report any observations regarding the test sample becoming dangerous or unsafe as a result of the application of the tests called for herein.

The present document does not address the testing of ancillary equipment on a stand-alone basis, i.e. separately from the radio equipment with which it is to be used.

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] ITU Radio Regulations 1998.

[2] ITU-T Recommendation E.161 (1988): "Arrangement of digits, letters and symbols on telephones and other devices that can be used for gaining access to a telephone network".

[3] International Convention for the Safety of Life at Sea, (SOLAS), as amended 1988.

- [4] IMO Resolutions A.806(19): "Performance standards for shipborne MF/HF radio installations capable of voice communication, narrow-band direct printing and digital selective calling".
- [5] IMO Resolutions A.694(17): "General requirements for shipborne radio equipment forming part of the global maritime distress and safety system (GMDSS) and for electronic navigational aids".
- [6] ITU-R Recommendation M.493-10 (2000): "Digital selective-calling system for use in the maritime mobile service".
- [7] IEC 61162-1 (2000-07): "Maritime navigation and radiocommunication equipment and systems - Digital interfaces - Part 1: Single talker and multiple listeners".
- [8] ISO 3791: "Office machines and data processing equipment - Keyboard layouts for numeric applications".
- [9] ETSI TR 100 028 (all parts): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics".
- [10] ETSI ETS 300 067: "Radio Equipment and Systems (RES); Radiotelex equipment operating in the maritime MF/HF service; Technical Characteristics and methods of measurement".
- [11] IEC 60050-161: "International Electrotechnical Vocabulary. Chapter 161: Electromagnetic compatibility".
- [12] CISPR 16-1: "Specification for radio disturbance and immunity measuring apparatus and methods - Part 1: Radio disturbance and immunity measuring apparatus".
- [13] EN 60945: "Maritime navigation and radiocommunication equipment and systems - General requirements - Methods of testing and required test results".
- [14] EN 61000-4-2: "Electromagnetic compatibility (EMC) - Part 4-2: Testing and measurement techniques - Electrostatic discharge immunity test".
- [15] EN 61000-4-3: "Electromagnetic compatibility (EMC) - Part 4-3: Testing and measurement techniques - Radiated, radio-frequency, electromagnetic field immunity test".
- [16] EN 61000-4-4: "Electromagnetic compatibility (EMC) - Part 4-4: Testing and measurement techniques - Electrical fast transient/burst immunity test".
- [17] EN 61000-4-6: "Electromagnetic compatibility (EMC) - Part 4-6: Testing and measurement techniques - Immunity to conducted disturbances, induced by radio-frequency fields".
- [18] IEC 61000-4-11: "Electromagnetic compatibility (EMC) - Part 4-11: Testing and measurement techniques - Voltage dips, short interruptions and voltage variations immunity tests".
- [19] EN 61000-4-5: "Electromagnetic compatibility (EMC) - Part 4-5: Testing and measurement techniques - Surge immunity test".
- [20] Council Directive 96/98/EC of 20 December 1996 on marine equipment (the Marine Equipment Directive).

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply.

ancillary equipment: equipment (apparatus) used in connection with a transmitter or receiver is considered to be an ancillary equipment if:

- the equipment is intended for use in conjunction with a transmitter or receiver to provide additional operational or control features to the radio equipment (e.g. to extend control to another position or location); and
- the equipment cannot be used on a stand alone basis to provide user functions independently of the radio equipment; and
- the radio equipment to which it is connected is capable of providing some intended operation, such as transmitting or receiving, without the ancillary equipment (i.e. it is not a sub-unit of the radio equipment essential to the basic functions of the radio equipment).

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

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

continuous phenomena (continuous disturbance): electromagnetic disturbance, the effects of which on a particular device or equipment cannot be resolved into a succession of distinct effects (see IEC 60050-161)

duplex: radiocommunications operation over a two-frequency channel with simultaneous transmission and reception.

effective radiated power: product of the power supplied to the antenna and its gain relative to a half-wave dipole (see ITU Radio Regulations).

enclosure port: physical boundary of the apparatus through which electromagnetic fields may radiate or impinge

NOTE: In the case of integral antenna equipment, this port is inseparable from the antenna port.

port: particular interface, of the specified equipment (apparatus), with the electromagnetic environment

NOTE: For example, any connection point on an equipment intended for connection of cables to or from that equipment is considered as a port (see figure 1).

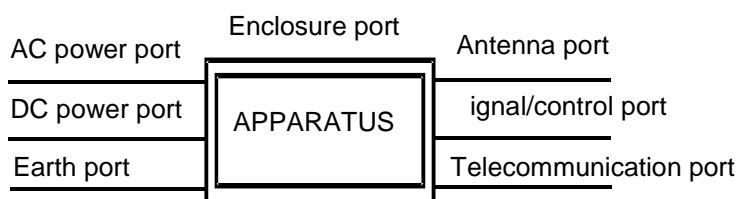


Figure 1: EUT Ports for EMC purposes

Q ratio: ratio of an observed magnitude of acceleration at the equipment to the magnitude of acceleration at the base of the vibration table

radio communications equipment: marine communications equipment which includes one or more radio transmitters or receivers or parts thereof, for use in a mobile or portable application onboard ship

NOTE: Such equipment may be operated with ancillary equipment but, if so, is not dependent upon it for basic functionality.

simplex: radiocommunications operation over a single-frequency or two-frequency channel with manual control to alternate between transmission and reception

spurious emission: emission on a frequency, or frequencies, which are outside the necessary bandwidth and the level of which may be reduced without affecting the corresponding transmission of information

NOTE: Spurious emissions include harmonic emissions, parasitic emissions, intermodulation products and frequency conversion products but exclude out-of-band emissions (ITU Radio Regulations).

switching range: maximum frequency range over which the receiver or the transmitter can be operated without reprogramming or realignment

transient phenomena: Pertaining to or designating a phenomena or a quantity which varies between two consecutive steady states during a time interval short compared with the time-scale of interest (IEC 60050-161).

3.2 Symbols

For the purposes of the present document, the following symbols apply as defined in the Radio Regulations [1]:

F1B	frequency modulation, single channel containing quantized or digital information without the use of a modulating sub-carrier, telegraphy for automatic reception.
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.
dB _A	dB relative to 2×10^{-5} Pascal
dB _d	antenna gain relative to a half-wave dipole
dB _{μV}	dB relative to 1 microvolt emf
dB _{μV/m}	dB relative to 1 microvolt per metre

3.3 Abbreviations

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

AC	Alternating Current	SIST EN 300 373-1 V1.2.1:2003
AGC	Automatic Gain Control	http://catalog.standards/sist/8a8bce8d-3833-4102-a5c9-4849a189c67a/sist-en-300-373-1-v1-2-1-2003
Bd	Baud	
BER	Bit Error Rate	
DC	Direct Current	
DSC	Digital Selective Calling	
EE	Equipment Engineering	
EMC	ElectroMagnetic Compatibility	
emf	electromotive force	
ESD	Electrostatic Discharge	
EUT	Equipment Under Test	
FSI	Frequency Set Information	
FSK	Frequency Shift Keying	
IEC	International Electrotechnical Committee	
IF	Intermediate Frequency	
IMO	International Maritime Organization	
ISO	International Standards Organization	
ITU	International Telecommunications Union	
MF	Medium Frequency	
MF/HF	Medium and High Frequency	
MMS	Maritime Mobile Service	
NBDP	Narrow Band Direct Printing telegraphy	
RF	Radio Frequency	
RMS	Root Mean Square	
rms	root mean square	
SINAD	Signal + Noise + Distortion / Noise + Distortion	
SNR	Signal-to-Noise Ratio	
SOLAS	Safety Of Life At Sea	
sr	switching range	
SSB	Single SideBand	
USB	Upper SideBand	