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**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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# ETSI EN 300 373-1 V1.4.1 (2013-09)



**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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# Contents

Intellectual Property Rights .....	10
Foreword.....	10
1 Scope .....	11
2 References .....	11
2.1 Normative references .....	11
2.2 Informative references.....	12
3 Definitions, symbols and abbreviations .....	13
3.1 Definitions.....	13
3.2 Symbols.....	13
3.3 Abbreviations .....	14
4 General requirements .....	15
4.1 Construction .....	15
4.1.1 Design.....	15
4.1.2 Inspection and maintenance.....	15
4.1.3 Illumination.....	15
4.1.4 Antenna static protection .....	15
4.1.5 Digital input panels.....	15
4.1.6 DSC operation .....	15
4.1.7 NBDP operation.....	16
4.1.8 Interfaces.....	16
4.1.8.1 Audio frequency.....	16
4.1.8.2 Digital interfaces.....	16
4.1.9 Antenna matching.....	16
4.2 Controls and indicators.....	16
4.2.1 General.....	16
4.2.2 Ease of use.....	17
4.2.3 Loudspeaker switching .....	17
4.2.4 Noise reducer.....	17
4.2.5 Frequency indication and class of emission.....	17
4.2.6 Synthesizer lock.....	17
4.2.7 Channel switching .....	17
4.2.8 Distress controls.....	17
4.2.9 Telephony transmit control .....	17
4.2.10 Misuse.....	18
4.2.11 Control panel priority.....	18
4.2.12 Manual gain control and Automatic Gain Control (AGC).....	18
4.2.13 Output indication .....	18
4.2.14 Audio Processing .....	18
4.3 Labels .....	18
4.3.1 General.....	18
4.3.2 Power supplies .....	18
4.3.3 Distress frequencies .....	18
4.3.4 Manufacturer.....	19
4.3.5 Compass safe distance .....	19
4.4 Safety precautions .....	19
4.4.1 Protection.....	19
4.4.2 Earthing .....	19
4.4.3 Access.....	19
4.4.4 Memories .....	19
4.5 Classes of emission .....	20
4.6 Frequency bands.....	20
4.6.1 Requirement.....	20
4.6.2 MF band.....	20
4.6.3 HF bands.....	20

4.7	Warming up period.....	20
4.7.1	Time.....	20
4.7.2	Heaters.....	20
4.7.3	Heating circuits.....	20
4.7.4	Delay.....	20
4.8	Instructions.....	21
4.8.1	Repair instructions.....	21
4.8.2	Accessibility.....	21
5	Test conditions.....	21
5.1	General.....	21
5.2	Test power source.....	21
5.3	Internally generated signals.....	21
5.4	Normal test conditions.....	22
5.4.1	Normal temperature and humidity.....	22
5.4.2	Normal test power source.....	22
5.4.2.1	Mains voltage and frequency.....	22
5.4.2.2	Secondary battery power sources.....	22
5.4.2.3	Other power sources.....	22
5.5	Extreme test conditions.....	22
5.5.1	Extreme temperature tests.....	22
5.5.2	Extreme values of test power source.....	22
5.5.2.1	Mains voltage and mains frequency.....	22
5.5.2.2	Secondary battery power sources.....	22
5.5.2.3	Other power sources.....	23
5.6	Artificial antennas.....	23
5.6.1	Transmitters.....	23
5.6.2	Receivers.....	23
5.7	Standard test signals.....	23
5.7.1	Test signals applied to the receiver input.....	23
5.7.1.1	Sources.....	23
5.7.1.2	Levels.....	23
5.7.2	Normal test signals.....	24
5.7.2.1	Class of emission J3E.....	24
5.7.3	Test signals for equipment with integrated DSC decoder.....	24
5.7.3.1	Reference to standard DSC signals.....	24
5.7.3.2	Standard DSC test signal 1.....	24
5.7.3.3	Standard DSC test signal 2.....	24
5.7.4	Symbol error rate at the DSC receiving part.....	24
5.7.5	Choice of testing frequencies.....	24
5.7.6	Exclusion bands for emissions testing.....	25
5.7.6.1	Receiver exclusion bands.....	25
5.7.6.2	Transmitter exclusion bands.....	25
5.7.7	Reference bandwidths for spurious measurements.....	25
5.8	Measurement uncertainty and interpretation of the measuring results.....	25
5.8.1	Measurement uncertainty.....	25
5.8.2	Interpretation of measurement results.....	26
6	General conditions of measurement.....	26
6.1	Sequence of testing.....	26
7	Environmental tests.....	26
7.1	Introduction.....	26
7.2	Procedure.....	27
7.3	Performance check.....	27
7.4	Performance check of DSC with encoder/decoder.....	27
7.5	Vibration test.....	28
7.5.1	Method of measurement.....	28
7.5.2	Requirement.....	28
7.6	Temperature tests.....	28
7.6.1	General.....	28
7.6.2	Dry heat.....	28
7.6.2.1	Internally mounted equipment.....	28

7.6.2.1.1	Method of measurement .....	28
7.6.2.1.2	Requirement .....	29
7.6.2.2	Externally mounted equipment .....	29
7.6.2.2.1	Method of measurement .....	29
7.6.2.2.2	Requirement .....	29
7.6.3	Damp heat .....	29
7.6.3.1	Method of measurement .....	29
7.6.3.2	Requirement .....	29
7.6.4	Low temperature cycle .....	30
7.6.4.1	Internally mounted equipment .....	30
7.6.4.1.1	Method of measurement .....	30
7.6.4.1.2	Requirement .....	30
7.6.4.2	Externally mounted equipment .....	30
7.6.4.2.1	Method of measurement .....	30
7.6.4.2.2	Requirement .....	30
7.7	Corrosion test .....	30
7.7.1	General .....	30
7.7.2	Method of measurement .....	31
7.7.3	Requirements .....	31
7.8	Rain test .....	31
7.8.1	General .....	31
7.8.2	Method of measurement .....	32
7.8.3	Requirements .....	32
8	Transmitter .....	32
8.1	General .....	32
8.1.1	Output power reduction .....	32
8.1.2	Class of emission .....	32
8.1.3	Minimum number of operating frequencies .....	32
8.1.3.1	Transmitters operating between 1 606,5 kHz to 4 000 kHz only .....	32
8.1.3.2	Transmitters operating between 1 606,5 kHz to 27 500 kHz .....	33
8.2	Frequency error .....	33
8.2.1	Definition .....	33
8.2.2	Method of measurement .....	33
8.2.3	Limits .....	33
8.3	Output power and intermodulation products .....	33
8.3.1	Definitions .....	33
8.3.2	Method of measurement .....	34
8.3.3	Limits .....	34
8.3.3.1	Output power in the range 1 606,5 kHz to 4 000 kHz for all modulation modes .....	34
8.3.3.2	Output power in the range 4 MHz to 27,5 MHz for all modulation modes .....	34
8.3.3.3	Intermodulation products for SSB telephony modes .....	34
8.4	Unwanted frequency modulation .....	34
8.4.1	Definition .....	34
8.4.2	Method of measurement .....	34
8.4.3	Limits .....	35
8.5	Sensitivity of the microphone .....	35
8.5.1	Definition .....	35
8.5.2	Method of measurement .....	35
8.5.3	Limits .....	35
8.6	Sensitivity of the 600 $\Omega$ line input for SSB telephony .....	35
8.6.1	Definition .....	35
8.6.2	Method of measurement .....	35
8.6.3	Limits .....	35
8.7	Automatic level control and/or limiter for SSB telephony .....	35
8.7.1	Method of measurement .....	36
8.7.2	Limits .....	36
8.8	Audio frequency response of SSB telephony .....	36
8.8.1	Definition .....	36
8.8.2	Method of measurement .....	37
8.8.3	Limits .....	37
8.9	Power of out-of-band emissions of SSB telephony .....	37

8.9.1	Definition.....	37
8.9.2	Method of measurement .....	38
8.9.3	Limits.....	38
8.10	Power of conducted spurious emissions of SSB telephony.....	38
8.10.1	Definition.....	38
8.10.2	Method of measurement .....	38
8.10.3	Limits.....	39
8.11	Residual hum and noise power for telephony.....	39
8.11.1	Definition.....	39
8.11.2	Method of measurement .....	39
8.11.3	Limits.....	39
8.12	Carrier suppression.....	39
8.12.1	Definition.....	39
8.12.2	Method of measurement .....	39
8.12.3	Limits.....	40
8.13	Continuous operation on telephony.....	40
8.13.1	Definition.....	40
8.13.2	Method of measurement .....	40
8.13.3	Limits.....	40
8.14	Protection of transmitter .....	40
8.14.1	Definition.....	40
8.14.2	Method of measurement .....	40
8.14.3	Limits.....	40
8.15	Radiated spurious emissions.....	40
8.15.1	Definition.....	40
8.15.2	Method of measurement .....	41
8.15.3	Limits.....	42
9	Transmitter with DSC encoder.....	42
9.1	Frequency error .....	42
9.1.1	Definition.....	42
9.1.2	Method of measurement .....	42
9.1.3	Limits.....	42
9.2	Output power.....	42
9.2.1	Definitions .....	42
9.2.2	Method of measurement .....	43
9.2.3	Limits.....	43
9.2.3.1	Output power in the range 1 606,5 kHz to 4 000 kHz.....	43
9.2.3.2	Output power in the range 4 MHz to 27,5 MHz for all modulation modes.....	43
9.2.3.3	Difference of power of B-state frequency and Y-state frequency .....	43
9.3	Out-of-band emission of DSC.....	43
9.3.1	Definition.....	43
9.3.2	Method of measurement .....	43
9.3.3	Limits.....	43
9.4	Spurious emission of DSC .....	44
9.4.1	Definition.....	44
9.4.2	Method of measurement .....	44
9.4.3	Limits.....	45
9.5	Residual frequency modulation of DSC.....	45
9.5.1	Definition.....	45
9.5.2	Method of measurement .....	45
9.5.3	Limits.....	45
9.6	Modulation rate of DSC .....	45
9.6.1	Definition.....	45
9.6.2	Method of measurement .....	45
9.6.3	Limits.....	46
9.7	Testing of call sequences of DSC.....	46
9.8	Transmitter tuning of DSC equipment .....	46
9.9	Testing of free channel transmission on DSC frequencies .....	46
9.9.1	Definition.....	46
9.9.2	Method of measurement .....	46
9.9.2.1	Distress frequency.....	46

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9.9.2.2	Ship-ship routine frequency .....	47
9.9.3	Requirement.....	47
10	Receiver.....	47
10.1	Receiver output powers .....	47
10.1.1	Standard output power .....	47
10.1.2	Rated output power.....	47
10.2	Frequency error .....	48
10.2.1	Definition.....	48
10.2.2	Method of measurement .....	48
10.2.3	Limits.....	48
10.3	Unwanted frequency modulation .....	48
10.3.1	Definition.....	48
10.3.2	Method of measurement .....	48
10.3.3	Limits.....	48
10.4	Pass band .....	49
10.4.1	Definition.....	49
10.4.2	Method of measurement .....	49
10.4.2.1	Class of emission J3E.....	49
10.4.3	Limits.....	49
10.5	Maximum usable sensitivity.....	49
10.5.1	Definition.....	49
10.5.2	Methods of measurement.....	49
10.5.3	Limits.....	50
10.6	Adjacent signal selectivity.....	50
10.6.1	Definition.....	50
10.6.2	Method of measurement .....	50
10.6.3	Limits.....	50
10.7	Blocking or desensitization .....	50
10.7.1	Definition.....	50
10.7.2	Method of measurement .....	51
10.7.3	Limits.....	51
10.8	Intermodulation response.....	51
10.8.1	Definition.....	51
10.8.2	Method of measurement .....	51
10.8.2.1	Class of emission J3E.....	51
10.8.3	Limits.....	52
10.9	Reciprocal mixing .....	52
10.9.1	Definition.....	52
10.9.2	Method of measurement .....	52
10.9.3	Results .....	52
10.10	Spurious response rejection ratio.....	52
10.10.1	Definition.....	52
10.10.2	Method of measurement .....	53
10.10.3	Limits.....	53
10.11	Harmonic content in output .....	54
10.11.1	Definition.....	54
10.11.2	Method of measurement .....	54
10.11.3	Limits.....	54
10.12	Audio frequency intermodulation.....	54
10.12.1	Definition.....	54
10.12.2	Method of measurement .....	54
10.12.3	Limits.....	54
10.13	Conducted spurious emissions .....	54
10.13.1	Definition.....	54
10.13.2	Methods of measurement.....	55
10.13.3	Limits.....	55
10.14	Internally generated spurious signals .....	55
10.14.1	Definition.....	55
10.14.2	Method of measurement .....	55
10.14.3	Limits.....	55
10.15	AGC efficiency .....	55

10.15.1	Definition.....	55
10.15.2	Method of measurement and limits.....	56
10.15.2.1	Settings.....	56
10.15.2.2	Increase in Signal-to-Noise Ratio (SNR).....	56
10.15.2.3	Range.....	56
10.16	AGC time constants (attack and recovery time).....	56
10.16.1	Definitions.....	56
10.16.2	Method of measurement.....	56
10.16.3	Limits.....	56
10.17	Protection of input circuits.....	57
10.17.1	Definition.....	57
10.17.2	Method of measurement.....	57
10.17.3	Limit.....	57
10.18	Radiated spurious emission.....	57
10.18.1	Definition.....	57
10.18.2	Method of measurement.....	57
10.18.3	Limits.....	58
11	Receiver with DSC decoder.....	58
11.1	Calling sensitivity.....	58
11.1.1	Definition.....	58
11.1.2	Method of measurement.....	58
11.1.3	Limits.....	59
11.2	Adjacent channel selectivity.....	59
11.2.1	Definition.....	59
11.2.2	Method of measurement.....	59
11.2.3	Limits.....	59
11.3	Co-channel rejection.....	60
11.3.1	Definition.....	60
11.3.2	Method of measurement.....	60
11.3.3	Limits.....	60
11.4	Intermodulation response.....	60
11.4.1	Definition.....	60
11.4.2	Method of measurement.....	60
11.4.3	Limits.....	61
11.5	Spurious response rejection.....	61
11.5.1	Definition.....	61
11.5.2	Method of measurement.....	61
11.5.3	Limits.....	62
11.6	Blocking immunity.....	62
11.6.1	Definition.....	62
11.6.2	Method of measurement.....	62
11.6.3	Limits.....	62
11.7	Dynamic range.....	62
11.7.1	Definition.....	62
11.7.2	Method of measurements.....	62
11.7.3	Limits.....	63
11.8	Verification of correct decoding of various types of DSC signals.....	63
<b>Annex A (normative):</b>	<b>Radiated measurement.....</b>	<b>64</b>
A.1	Test sites and general arrangements for measurements involving the use of radiated fields.....	64
A.1.1	Anechoic chamber.....	64
A.1.2	Anechoic chamber with a ground plane.....	65
A.1.3	OATS.....	66
A.1.4	Test antenna.....	67
A.1.5	Substitution antenna.....	67
A.1.6	Measuring antenna.....	68
A.2	Guidance on the use of radiation test sites.....	68
A.2.1	Verification of the test site.....	68
A.2.2	Preparation of the EUT.....	68
A.2.3	Power supplies to the EUT.....	68

A.2.4	Volume control setting for analogue speech tests .....	68
A.2.5	Range length.....	69
A.2.6	Site preparation .....	69
A.3	Coupling of signals.....	70
A.3.1	General .....	70
A.3.2	Data signals .....	70
A.3.3	Speech and analogue signals .....	70
A.3.3.1	Acoustic coupler description.....	70
A.3.3.2	Calibration .....	71
<b>Annex B (normative):</b>	<b>Spectrum analyser specification .....</b>	<b>72</b>
<b>Annex C (normative):</b>	<b>Protocol for the EN 61162-1 Commands Frequency Set Information (FSI) .....</b>	<b>73</b>
C.1	Frequency Set Information (FSI) .....	73
<b>Annex D (informative):</b>	<b>DSC test calls.....</b>	<b>74</b>
D.1	Interoperability tests.....	74
<b>Annex E (informative):</b>	<b>Bibliography.....</b>	<b>75</b>
History	.....	76

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## Foreword

This European Standard (EN) 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; Equipment with integrated or associated equipment for Class E Digital Selective Calling (DSC)".

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.

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# 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 [6], 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 [6], the International Convention for the Safety Of Life At Sea (SOLAS) [i.1], the IMO Resolutions A.694(17) [i.3] and A806 (19) [i.2] 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 [i.12].

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 Recommendation M.493-13 ITU-R [i.4].

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 1: The requirements for integrated equipment may be found in other relevant ENs.

NOTE 2: The requirements for other modes of operation may be found in other relevant ENs.

The tests in the present document are applicable to equipment operating on all frequencies in the bands 1 606,5 kHz to 4 000 kHz or 1 606,5 kHz to 27,5 MHz as allocated in the Radio Regulations [6], to the MMS.

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.

NOTE 3: The EMC requirements and requirements for cabinet radiation for ancillary equipment are found in EN 301 843-5 [i.5], clause 7.1.1. SIST EN 300 373-1 V1.4.1:2013  
http://standards.iteh.ai/SIST EN 300 373-1 V1.4.1:2013

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# 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 301 033: "Electromagnetic compatibility and Radio spectrum Matters (ERM); Technical characteristics and methods of measurement for shipborne watchkeeping receivers for reception of Digital Selective Calling (DSC) in the maritime MF, MF/HF and VHF bands".
- [2] Recommendation ITU-T 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".
- [3] CENELEC EN 61162-1 (2011): "Maritime navigation and radiocommunication equipment and systems - Digital interfaces - Part 1: Single talker and multiple listeners".

- [4] ISO 3791 (1976): "Office machines and data processing equipment -- Keyboard layouts for numeric applications".
- [5] ETSI TR 100 028 (V1.4.1) (all parts): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics".
- [6] ITU Radio Regulations (2012).
- [7] ANSI C63.5-2006: "American National Standard for Electromagnetic Compatibility - Radiated Emission Measurements in Electromagnetic Interference (EMI) Control - Calibration of Antennas (9 kHz to 40 GHz)".
- [8] IEC 60489-3 Second edition (1999) appendix F: "Methods of measurement for radio equipment used in the mobile services. Part 3: Receivers for A3E or F3E emissions".
- [9] ETSI EN 300 338-2 (V1.3.1): "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 2: Class A/B DSC".
- [10] CISPR 16-1-1 ed. 3.1 (2010) "Specification for radio disturbance and immunity measuring apparatus and methods - Part 1-1: Radio disturbance and immunity measuring apparatus - Measuring apparatus".

## 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] International Convention for the Safety of Life at Sea (SOLAS), as amended.
- [i.2] 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".  
<https://standards.iteh.ai/catalog/standards/sist/aeb52309-6671-47fb-a4bd-0a0694171337>
- [i.3] IMO Resolutions A.694(17): "General Requirements for Shipborne Radio Equipment Forming Part of the Global Maritime Distress and Safety System and for Electronic Navigational Aids".
- [i.4] Recommendation ITU-R M.493-13: "Digital selective-calling system for use in the maritime mobile service".
- [i.5] ETSI EN 301 843-5: "Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for marine radio equipment and services; Part 5: Specific conditions for MF/HF radiotelephone transmitters and receivers".
- [i.6] ETSI ETS 300 019-1-6: "Equipment Engineering (EE); Environmental conditions and environmental tests for telecommunications equipment; Part 1-6: Classification of environmental conditions; Ship environments".
- [i.7] Recommendation ITU-R SM.326-6: "Determination and measurement of the power of radio transmitters".
- [i.8] Recommendation ITU-R SM.332-4: "Selectivity of receivers".
- [i.9] ETSI TR 102 273 (parts 2, 3 and 4): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Improvement on Radiated Methods of Measurement (using test site) and evaluation of the corresponding measurement uncertainties".
- [i.10] ETSI TS 101 570-2 (V1.1.1): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Interoperability Testing for Maritime Digital Selective Calling (DSC) Radios; Part 2: Class A/B Test Descriptions".
- [i.11] ETSI ETS 300 067 (Edition 1) (1990): "Radio Equipment and Systems (RES); Radiotelex equipment operating in the maritime MF/HF service; Technical Characteristics and methods of measurement".

[i.12] Council Directive 96/98/EC of 20 December 1996 on marine equipment (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 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

**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.

**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

### 3.2 Symbols

For the purposes of the present document, the following symbols apply as defined in the Radio Regulations [6]:

dBA	dB relative to $2 \times 10^{-5}$ Pascal
dBd	antenna gain relative to a half-wave dipole
dB $\mu$ V	dB relative to 1 microvolt emf
dB $\mu$ V/m	dB relative to 1 microvolt per metre