



**Portable Very High Frequency (VHF) radiotelephone equipment
for the maritime mobile service operating in the VHF bands
(for non-GMDSS applications only);
Harmonised Standard covering the essential requirements
of article 3.2 of the Directive 2014/53/EU**

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Contents

Intellectual Property Rights	7
Foreword.....	7
Modal verbs terminology.....	7
1 Scope	8
2 References	8
2.1 Normative references	8
2.2 Informative references.....	8
3 Definitions, symbols and abbreviations	9
3.1 Definitions.....	9
3.2 Symbols.....	9
3.3 Abbreviations	9
4 General and operational requirements.....	10
4.1 Construction	10
4.2 Controls and indicators.....	10
4.3 Microphone and loudspeaker	11
4.4 Safety precautions	11
4.5 Labelling.....	11
5 Technical requirements specifications	12
5.1 Environmental profile.....	12
5.2 Conformance requirements	12
5.2.1 Switching time	12
5.2.2 Class of emission and modulation characteristics.....	12
6 General conditions of measurement	12
6.1 Arrangements for RF connections to the equipment.....	12
6.1.1 RF connections to integral antenna equipment	12
6.1.2 RF connection to equipment with a detachable antenna.....	12
6.2 Arrangements for test signals applied to the receiver input.....	12
6.3 Squelch.....	12
6.4 Normal test modulation	12
6.5 Artificial antenna.....	13
6.6 Arrangements for test signals applied to the transmitter input	13
6.7 Test channels.....	13
6.8 Test conditions, power sources and ambient temperatures.....	13
6.8.1 Normal and extreme test conditions.....	13
6.8.2 Test power source	13
6.9 Normal test conditions.....	13
6.9.1 Normal temperature and humidity	13
6.9.2 Normal power sources	13
6.9.2.1 Battery power source.....	13
6.9.2.2 Other power sources.....	14
6.10 Extreme test conditions	14
6.10.0 General.....	14
6.10.1 Extreme temperatures	14
6.10.2 Extreme values of test power sources	14
6.10.2.1 Battery power source.....	14
6.10.2.2 Other power sources.....	14
6.11 Procedure for tests at extreme temperatures.....	14
7 Environmental tests	14
7.1 Procedure.....	14
7.2 Performance check	15
7.3 Drop test.....	15
7.3.1 Definition.....	15
7.3.2 Method of measurement	15

7.3.3	Requirement.....	15
7.4	Temperature tests	15
7.4.1	Definition.....	15
7.4.2	Dry heat	15
7.4.2.1	Definition	15
7.4.2.2	Method of measurement.....	15
7.4.2.3	Requirement	16
7.4.3	Damp heat.....	16
7.4.3.1	Definition	16
7.4.3.2	Method of measurement.....	16
7.4.3.3	Requirement	16
7.4.4	Low temperature cycle.....	16
7.4.4.1	Definition	16
7.4.4.2	Method of measurement.....	16
7.4.4.3	Requirement	16
8	Transmitter	16
8.1	Frequency error	16
8.1.1	Definition.....	16
8.1.2	Method of measurement	17
8.1.3	Limits.....	17
8.2	Carrier power.....	17
8.2.1	Definitions	17
8.2.2	Method of measurement	17
8.2.3	Limits, Normal and extreme test conditions	17
8.3	Frequency deviation	17
8.3.1	Definition.....	17
8.3.2	Maximum permissible frequency deviation.....	17
8.3.2.1	Method of measurement.....	17
8.3.2.2	Limits	17
8.3.3	Reduction of frequency deviation at modulation frequencies above 3 kHz.....	18
8.3.3.1	Method of measurement	18
8.3.3.2	Limits	18
8.4	Sensitivity of the modulator, including microphone	19
8.4.1	Definition.....	19
8.4.2	Method of measurement	19
8.4.3	Limits.....	19
8.5	Audio frequency response	19
8.5.1	Definition.....	19
8.5.2	Method of measurement	19
8.5.3	Limit	19
8.6	Audio frequency harmonic distortion of the emission.....	20
8.6.1	Definition.....	20
8.6.2	Method of measurement	20
8.6.2.1	RF Coupling to the test demodulator	20
8.6.2.2	Normal test conditions	20
8.6.2.3	Extreme test conditions	21
8.6.3	Limits.....	21
8.7	Adjacent channel power	21
8.7.1	Definition.....	21
8.7.2	Method of measurement	21
8.7.3	Limits.....	21
8.8	Conducted spurious emissions conveyed to the antenna	22
8.8.1	Definition.....	22
8.8.2	Method of measurement	22
8.8.3	Limit	22
8.9	Cabinet radiation and conducted spurious emissions other than those conveyed to the antenna	22
8.9.1	Definitions	22
8.9.2	Method of measurement	22
8.9.3	Limits.....	23
8.10	Residual modulation of the transmitter	23
8.10.1	Definition.....	23

8.10.2	Method of measurement	23
8.10.3	Limit	24
8.11	Transient frequency behaviour of the transmitter.....	24
8.11.1	Definitions	24
8.11.2	Method of measurement	24
8.11.3	Limits.....	25
9	Receiver.....	27
9.1	Harmonic distortion and rated audio frequency output power	27
9.1.1	Definition.....	27
9.1.2	Methods of measurement.....	27
9.1.3	Limits.....	27
9.2	Audio frequency response	27
9.2.1	Definition.....	27
9.2.2	Method of measurement	27
9.2.3	Limits.....	28
9.3	Maximum usable sensitivity	28
9.3.1	Definition.....	28
9.3.2	Method of measurement	29
9.3.3	Limits.....	29
9.4	Co-channel rejection.....	29
9.4.1	Definition.....	29
9.4.2	Method of measurement	29
9.4.3	Limit	29
9.5	Adjacent channel selectivity.....	30
9.5.1	Definition.....	30
9.5.2	Method of measurement	30
9.5.3	Limits.....	30
9.6	Spurious response rejection.....	30
9.6.1	Definition.....	30
9.6.2	Method of measurement	30
9.6.3	Limit	31
9.7	Intermodulation response	31
9.7.1	Definition.....	31
9.7.2	Method of measurement	31
9.7.3	Limit	31
9.8	Blocking or desensitization	31
9.8.1	Definition.....	31
9.8.2	Method of measurement	31
9.8.3	Limit	32
9.9	Conducted spurious emissions	32
9.9.1	Definition.....	32
9.9.2	Method of measurement	32
9.9.3	Limit	32
9.10	Radiated spurious emissions.....	32
9.10.1	Definition.....	32
9.10.2	Method of measurements.....	32
9.10.3	Limit	33
9.11	Receiver noise and hum level.....	33
9.11.1	Definition.....	33
9.11.2	Method of measurement	33
9.11.3	Limit	34
9.12	Squelch operation.....	34
9.12.1	Definition.....	34
9.12.2	Method of measurement	34
9.12.3	Limits.....	34
9.13	Squelch hysteresis	35
9.13.1	Definition.....	35
9.13.2	Method of measurement	35
9.13.3	Limit	35
10	Testing for compliance with technical requirements.....	35

10.1	Environmental conditions for testing	35
10.2	Interpretation of the measurement results	35
Annex A (normative):	Relationship between the present document and the essential requirements of Directive 2014/53/EU	37
Annex B (normative):	Measuring receiver for adjacent channel power measurement.....	39
B.1	Power measuring receiver specification.....	39
B.1.0	General	39
B.1.1	IF filter	39
B.1.2	Attenuation indicator.....	40
B.1.3	rms value indicator	40
B.1.4	Oscillator and amplifier	40
History	41

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Foreword

This draft Harmonised European Standard (EN) has been produced by ETSI Technical Committee Electromagnetic compatibility and Radio spectrum Matters (ERM), and is now submitted for the combined Public Enquiry and Vote phase of the ETSI standards EN Approval Procedure.

The present document has been prepared to provide a means of conforming to the essential requirements of Directive 2014/53/EU [i.2] of the European Parliament and of the Council of 16 April 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of radio equipment and repealing Directive 1999/5/EC.

NOTE: The corresponding Commission's standardization request is expected shortly.

Once the present document is cited in the Official Journal of the European Union under that Directive, compliance with the normative clauses of the present document given in table A.1 confers, within the limits of the scope of the present document, a presumption of conformity with the corresponding essential requirements of that Directive, and associated EFTA regulations.

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

Modal verbs terminology

In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the [ETSI Drafting Rules](#) (Verbal forms for the expression of provisions).

"**must**" and "**must not**" are **NOT** allowed in ETSI deliverables except when used in direct citation.

1 Scope

The present document states the minimum technical characteristics and methods of measurement required for portable Very High Frequency (VHF) radiotelephones not providing maritime distress and safety communications functions (i.e. not forming part of the Global Maritime Distress and Safety System (GMDSS)) operating in certain frequency bands allocated to the maritime mobile service using either 25 kHz or 25 kHz and 12,5 kHz channels.

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

The present document contains requirements to demonstrate that "... *Radio equipment shall be so constructed that it both effectively uses and supports the efficient use of radio spectrum in order to avoid harmful interference*" [i.2] and that "...*radio equipment supports certain features ensuring access to emergency services*" [i.2].

2 References

2.1 Normative 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 referenced 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.

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

- [1] ITU Radio Regulations (2012), appendix 18: "Table of transmitting frequencies in the VHF maritime mobile band".
- [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] Recommendation ITU-R M.493-13 (2009): "Digital selective-calling system for use in the maritime mobile service".
- [4] Recommendation ITU-R M.541-9 (2004): "Operational procedures for the use of digital selective-calling equipment in the maritime mobile service".
- [5] ETSI EN 300 225 (V1.4.1) (12-2004): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Technical characteristics and methods of measurement for survival craft portable VHF radiotelephone apparatus".
- [6] Recommendation ITU-T O.41 (10-1994): "Psophometer for use on telephone-type circuits".
- [7] Recommendation ITU-R M.1084-5 (03-2012): "Interim solutions for improved efficiency in the use of the band 156-174 MHz by stations in the maritime mobile service".
- [8] ETSI TS 103 052 (V1.1.1) (03-2011): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Radiated measurement methods and general arrangements for test sites up to 100 GHz".

2.2 Informative 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 referenced document (including any amendments) applies.

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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] Recommendation ITU-R SM.332-4: "Selectivity of receivers".
- [i.2] Directive 2014/53/EU of the European Parliament and of the Council of 16 April 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of radio equipment and repealing Directive 1999/5/EC.
- [i.3] 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".
- [i.4] ETSI TR 100 028-2 (V1.4.1) (12-2001): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics; Part 2".

3 Definitions, symbols and abbreviations

3.1 Definitions

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

block: to inhibit a function by making it inaccessible from the user interface

detachable antenna: antenna fixed to the equipment by means of an antenna connector and detachable by the user

G3E: phase-modulation (frequency modulation with a pre-emphasis of 6 dB/octave) for speech

integral antenna: antenna that is permanently fixed to the equipment and not detachable by the user

modulation index: ratio between the frequency deviation and the modulation frequency

performance check: check of:

- the transmitter carrier power and frequency
- receiver sensitivity

3.2 Symbols

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

dBa Relative to 2×10^{-5} Pa

3.3 Abbreviations

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

ad	amplitude difference
AIS	Automatic Identification System
DSC	Digital Selective Calling
emf	electromotive force
EUT	Equipment Under Test
fd	frequency difference
GMDSS	Global Maritime Distress and Safety System
IF	Intermediate Frequency
MPFD	Maximum Permissible Frequency Deviation
RF	Radio Frequency
rms	root mean square
SINAD	(Signal + Noise + Distortion)/(Noise + Distortion)
VHF	Very High Frequency

4 General and operational requirements

4.1 Construction

The manufacturer shall declare that compliance to the requirements of clause 4 is achieved and shall provide relevant documentation.

The mechanical and electrical construction and finish of the equipment shall conform in all respects to good engineering practice, and the equipment shall be suitable for use on board ships.

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.

All parts of the equipment to be checked during inspection or maintenance operations shall be readily accessible. The components shall be readily identifiable.

Technical documentation shall be supplied with the equipment.

The VHF maritime mobile service uses both single-frequency and two-frequency channels. For two-frequency channels there shall be a separation of 4,6 MHz between the transmitting frequency and the receiving frequency (see Radio Regulations appendix 18 [1]).

The equipment, which can consist of more than one unit, shall be capable of operating on single frequency and two-frequency channels with manual control (simplex).

The equipment shall be of a colour which distinguishes it from the portable VHF equipment specified in ETSI EN 300 225 [5].

The equipment shall be able to operate on all channels defined in ITU Radio Regulations, appendix 18 [1], noting in particular footnotes m) and e).

Additional VHF channels for maritime use outside those defined by appendix 18 to the ITU Radio Regulations [1] may also be provided where permitted by relevant administrations. These channels shall be clearly identified for use as relating to the relevant administration(s) and accessed through a positive action(s) for enabling use of these channel(s) but means shall be provided to block any or all of these additional channels if required by the relevant administration(s).

If 12,5 kHz channels are implemented in the equipment it shall be in accordance with Recommendation ITU-R M.1084-5 [7].

The equipment shall be so designed that use of channel 70 for purposes other than DSC is prevented (see Recommendations ITU-R M.493-13 [3] and M.541-9 [4]), and that use of channels AIS1 and AIS2 for purposes other than AIS is prevented.

Scan or multiple watch may be provided but means shall be provided to block or unblock these functions.

If the equipment is fitted with an auxiliary antenna connector, simultaneous connection of both the auxiliary antenna and the normal antenna shall be prevented.

It shall not be possible to transmit while any frequency synthesizer used within the transmitter is out of lock.

It shall not be possible to transmit during channel switching operations.

4.2 Controls and indicators

The equipment shall have a channel selector and shall indicate the designator, as shown in ITU Radio Regulations, appendix 18 [1], of the channel at which the equipment is set. The channel designator shall be legible irrespective of the external lighting conditions.

Channel 16 shall be distinctively marked. Selection of channel 16, shall be preferably by readily accessible means (e.g. a distinctively marked key). Selection of channel 16 by any means shall automatically set the transmitter output power to maximum. This power level may subsequently be reduced by manual user control if required.

Where an input panel on the equipment for entering the digits 0 to 9 is provided, this shall conform to Recommendation ITU-T E.161 [2].

The equipment shall have the following additional controls and indicators:

- on/off switch for the equipment with a visual indication that the equipment is in operation;
- a manual, non-locking push to talk switch to operate the transmitter with a visual indication that the transmitter is activated and facilities to limit the transmission time to a maximum of 5 minutes. A short audible alarm and a visual indication may be provided to show when the transmission will be automatically terminated within the next 10 s. It shall be possible to reoperate the push to talk switch and reactivate the transmitter after a 10 s period;
- a switch for reducing transmitter output power to no more than 1 W where the RF output power is more than 1 W;
- an audio frequency power volume control;
- a squelch control;
- a visual indication that the transmitter is activated.

The equipment shall also meet the following requirements:

- the user shall not have access to any control which, if wrongly set, might impair the technical characteristics of the equipment.

4.3 Microphone and loudspeaker

The equipment shall be fitted with an integral microphone and an integral loudspeaker.

During transmission the receiver output shall be muted.

4.4 Safety precautions

Measures shall be taken to protect the equipment against the effects of overcurrent or overvoltage.

Measures shall be taken to prevent damage to the equipment that might arise from an accidental reversal of polarity of the electrical power source.

No damage to the equipment shall occur when the antenna terminals are placed on open circuit or short circuit while transmitting for a period of at least 5 minutes in each case.

In order to provide protection against damage due to the build up of static voltages at the antenna terminals, there shall be a dc path from the antenna terminals to chassis not exceeding 100 k Ω .

The information in any volatile memory device shall be protected from interruptions in the power supply of up to 60 s duration.

4.5 Labelling

All controls, instruments, indicators and terminals shall be clearly labelled.

Details of any external power supply from which the equipment is intended to operate shall be clearly indicated on the equipment.

The equipment shall be clearly and indelibly marked on the exterior with the identification of the manufacturer, type designation of the equipment, the serial number of the unit and the text: "Not intended for distress and safety purposes".

The compass safe distance shall be stated on the equipment.

5 Technical requirements specifications

5.1 Environmental profile

The technical requirements of the present document apply under the environmental profile for operation of the equipment, which shall be declared by the supplier, but as a minimum, shall be that specified in the test conditions contained in the present document. The equipment shall comply with all the technical requirements of the present document at all times when operating within the boundary limits of the declared operational environmental profile.

5.2 Conformance requirements

5.2.1 Switching time

The channel switching arrangement shall be such that the time necessary to change over from using one of the channels to using any other channel does not exceed 5 s.

The time necessary to change over from transmission to reception or vice versa, shall not exceed 0,3 s.

5.2.2 Class of emission and modulation characteristics

The equipment shall use phase modulation, G3E (frequency modulation with a pre-emphasis of 6 dB/octave) for speech.

6 General conditions of measurement

6.1 Arrangements for RF connections to the equipment

6.1.1 RF connections to integral antenna equipment

For equipment without an antenna connector, the manufacturer shall prepare the equipment with a temporary 50 Ω connector to be used as the RF input/output port.

6.1.2 RF connection to equipment with a detachable antenna

Equipment having an antenna connector shall be tested using the antenna connector as the RF input/output port.

In the case where equipment has more than one antenna connector, the connector normally used to connect the portable antenna to the equipment shall be used.

6.2 Arrangements for test signals applied to the receiver input

Test signal sources shall be connected to the receiver input in such a way that the impedance presented to the receiver input is 50 Ω , irrespective of whether one or more test signals are applied to the receiver simultaneously.

The levels of the test signals shall be expressed in terms of the emf at the terminals to be connected to the receiver.

The nominal frequency of the receiver is the carrier frequency of the selected channel.

6.3 Squelch

Unless otherwise specified, the receiver squelch facility shall be made inoperative for the duration of the conformance tests.

6.4 Normal test modulation

For normal test modulation, the modulation frequency shall be:

- 25 kHz channels: 1 kHz and the frequency deviation shall be ± 3 kHz.