



SLOVENSKI STANDARD

SIST ETS 300 162 E1:2003

01-december-2003

FUX]g_UcdfYa U]b`g]ghYa]`fF9GLĚFUX]chY`YZc`bg_]`cXXU`b_]`]b`gdfY`Ya b_]`nU
dca cfg_Y`a cV]`bY`ghcf]`lj Yž_]`cVfUhi `Y`c`j`dUgcj]` J<: `Ě`HY\ b] bY`UfU`hYf]`gh]_Y
]b`a Yf]`bY`a YtcXY

Radio Equipment and Systems (RES); Radiotelephone transmitters and receivers for the maritime mobile service operating in VHF bands; Technical characteristics and methods of measurement

iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST ETS 300 162 E1:2003](https://standards.iteh.ai/catalog/standards/sist/1718379e-50de-4887-8792-6d82a69f497e/sist-ets-300-162-e1-2003)

<https://standards.iteh.ai/catalog/standards/sist/1718379e-50de-4887-8792-6d82a69f497e/sist-ets-300-162-e1-2003>

Ta slovenski standard je istoveten z: **ETS 300 162 Edition 1**

ICS:

33.060.20	Sprejemna in oddajna oprema	Receiving and transmitting equipment
47.020.70	Navigacijska in krmilna oprema	Navigation and control equipment

SIST ETS 300 162 E1:2003

en

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST ETS 300 162 E1:2003

<https://standards.iteh.ai/catalog/standards/sist/1718379e-50de-4887-8792-6d82a69f497e/sist-ets-300-162-e1-2003>



EUROPEAN
TELECOMMUNICATION
STANDARD

ETS 300 162

October 1993

Source: ETSI TC-RES

Reference: DE/RES-1002

ICS: 33.060

Key words: Maritime, radiotelephone, VHF

**Radio Equipment and Systems (RES);
Radiotelephone transmitters and receivers for the
maritime mobile service operating in the VHF bands
Technical characteristics and methods of measurement**

ETSI

European Telecommunications Standards Institute

ETSI Secretariat

Postal address: F-06921 Sophia Antipolis CEDEX - FRANCE

Office address: 650 Route des Lucioles - Sophia Antipolis - Valbonne - FRANCE

X.400: c=fr, a=atlas, p=etsi, s=secretariat - **Internet:** secretariat@etsi.fr

Tel.: +33 92 94 42 00 - Fax: +33 93 65 47 16

Copyright Notification: No part may be reproduced except as authorized by written permission. The copyright and the foregoing restriction extend to reproduction in all media.

© European Telecommunications Standards Institute 1993. All rights reserved.

iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST ETS 300 162 E1:2003](https://standards.iteh.ai/catalog/standards/sist/1718379e-50de-4887-8792-6d82a69f497e/sist-ets-300-162-e1-2003)

<https://standards.iteh.ai/catalog/standards/sist/1718379e-50de-4887-8792-6d82a69f497e/sist-ets-300-162-e1-2003>

Contents

Foreword	7
1 Scope	9
2 Normative references	9
3 General requirements	9
3.1 Construction	9
3.2 Controls and indicators	10
3.3 Handset and loudspeaker	11
3.4 Switching time	11
3.5 Safety precautions	12
3.6 Class of emission and modulation characteristics	12
3.7 Multiple watch facilities	12
3.7.1 Additional performance standards	12
3.7.2 Scanning characteristics	13
3.8 Facilities for DSC transmission and reception	14
3.9 Labelling	14
3.10 Warm up	14
4 Test conditions, power sources and ambient temperatures	15
4.1 Normal and extreme test conditions	15
4.2 Test power source	15
4.3 Normal test conditions	15
4.3.1 Normal temperature and humidity	15
4.3.2 Normal power sources	15
4.3.2.1 Mains voltage and frequency	15
4.3.2.2 Battery power source	15
4.3.2.3 Other power sources	15
4.4 Extreme test conditions	16
4.4.1 Extreme temperatures	16
4.4.2 Extreme values of test power sources	16
4.4.2.1 Mains voltage	16
4.4.2.2 Battery power source	16
4.4.2.3 Other power sources	16
4.5 Procedure for tests at extreme temperatures	16
4.6 Environmental tests	16
4.7 Extended usage tests	17
5 General conditions of measurement	17
5.1 Arrangements for test signals applied to the receiver input	17
5.2 Squelch	17
5.3 Normal test modulation	17
5.4 Artificial antenna	17
5.5 Arrangements for test signals applied to the transmitter input	17
5.6 Tests on equipment with a duplex filter	17
5.7 Test channels	18
5.8 Measurement uncertainty and interpretation of the measured results	18
5.8.1 Measurement uncertainty	18
5.8.2 Interpretation of the measurement results	18

6	Transmitter	19
6.1	Frequency error.....	19
6.1.1	Definition.....	19
6.1.2	Method of measurement.....	19
6.1.3	Limits	19
6.2	Carrier power.....	19
6.2.1	Definitions	19
6.2.2	Method of measurement.....	19
6.2.3	Limits	19
6.2.3.1	Normal test conditions	19
6.2.3.2	Extreme test conditions.....	20
6.3	Frequency deviation	20
6.3.1	Definition.....	20
6.3.2	Maximum permissible frequency deviation.....	20
6.3.2.1	Method of measurement.....	20
6.3.2.2	Limits.....	20
6.3.3	Reduction of frequency deviation at modulation frequencies above 3 kHz ..	20
6.3.3.1	Method of measurement.....	20
6.3.3.2	Limits.....	20
6.4	Limitation characteristics of the modulator.....	21
6.4.1	Definition.....	21
6.4.2	Method of measurement.....	21
6.4.3	Limits	21
6.5	Sensitivity of the modulator, including microphone	21
6.5.1	Definition.....	21
6.5.2	Method of measurement.....	22
6.5.3	Limits	22
6.6	Audio frequency response.....	22
6.6.1	Definition.....	22
6.6.2	Method of measurement.....	22
6.6.3	Limit	22
6.7	Audio frequency harmonic distortion of the emission.....	22
6.7.1	Definition.....	22
6.7.2	Method of measurement.....	22
6.7.2.1	Normal test conditions	22
6.7.2.2	Extreme test conditions.....	22
6.7.3	Limits	23
6.8	Adjacent channel power.....	23
6.8.1	Definition.....	23
6.8.2	Measurement.....	23
6.8.2.1	Method of measurement.....	23
6.8.2.2	Power measuring receiver specification	23
6.8.2.2.1	IF filter	24
6.8.2.2.2	Attenuation indicator.....	25
6.8.2.2.3	RMS value indicator	25
6.8.2.2.4	Oscillator and amplifier.....	25
6.8.3	Limits	25
6.9	Conducted spurious emissions conveyed to the antenna.....	26
6.9.1	Definition.....	26
6.9.2	Method of measurement.....	26
6.9.3	Limit	26
6.10	Cabinet radiation and conducted spurious emissions other than those conveyed to the antenna	26
6.10.1	Definitions	26
6.10.2	Method of measurement.....	26
6.10.3	Limits	26
6.11	Residual modulation of the transmitter.....	27
6.11.1	Definition.....	27
6.11.2	Method of measurement.....	27
6.11.3	Limit	27
6.12	Transient frequency behaviour of the transmitter.....	27
6.12.1	Definitions	27

	6.12.2	Method of measurement	28
7	Receiver		31
	7.1	Harmonic distortion and rated audio frequency output power	31
		7.1.1 Definition	31
		7.1.2 Methods of measurement	31
		7.1.3 Limits	31
	7.2	Audio frequency response	31
		7.2.1 Definition	31
		7.2.2 Method of measurement	32
		7.2.3 Limits	32
	7.3	Maximum usable sensitivity	32
		7.3.1 Definition	32
		7.3.2 Method of measurement	32
		7.3.3 Limits	33
	7.4	Co-channel rejection	33
		7.4.1 Definition	33
		7.4.2 Method of measurement	33
		7.4.3 Limit	33
	7.5	Adjacent channel selectivity	33
		7.5.1 Definition	33
		7.5.2 Method of measurement	33
		7.5.3 Limits	34
	7.6	Spurious response rejection	34
		7.6.1 Definition	34
		7.6.2 Method of measurement	34
		7.6.3 Limit	34
	7.7	Intermodulation response	34
		7.7.1 Definition	34
		7.7.2 Method of measurement	34
		7.7.3 Limit	35
	7.8	Blocking or desensitisation	35
		7.8.1 Definition	35
		7.8.2 Method of measurement	35
		7.8.3 Limit	35
	7.9	Spurious emissions	36
		7.9.1 Definition	36
		7.9.2 Method of measuring the power level	36
		7.9.3 Method of measuring the effective radiated power	36
		7.9.4 Limit	36
	7.10	Amplitude response of the receiver limiter	36
		7.10.1 Definition	36
		7.10.2 Method of measurement	36
		7.10.3 Limit	37
	7.11	Receiver noise and hum level	37
		7.11.1 Definition	37
		7.11.2 Method of measurement	37
		7.11.3 Limit	37
	7.12	Squelch operation	37
		7.12.1 Definition	37
		7.12.2 Method of measurement	37
		7.12.3 Limits	38
	7.13	Squelch hysteresis	38
		7.13.1 Definition	38
		7.13.2 Method of measurement	38
		7.13.3 Limit	38
	7.14	Multiple watch characteristic	38

	7.14.1	Definition.....	38
	7.14.2	Method of measurement.....	39
	7.14.3	Limits	39
8		Duplex operation.....	39
	8.1	Receiver desensitisation with simultaneous transmission and reception.....	39
		8.1.1 Definition.....	39
		8.1.2 Method of measurement.....	39
		8.1.3 Limits	40
	8.2	Receiver spurious response rejection	40
9		Interference.....	40
	9.1	General.....	40
	9.2	Conducted spurious emission into the mains.....	40
		9.2.1 Conditions of measurement.....	40
		9.2.2 Method of measurement.....	40
		9.2.3 Limits	40
		History	42

iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST ETS 300 162 E1:2003](https://standards.iteh.ai/catalog/standards/sist/1718379e-50de-4887-8792-6d82a69f497e/sist-ets-300-162-e1-2003)

<https://standards.iteh.ai/catalog/standards/sist/1718379e-50de-4887-8792-6d82a69f497e/sist-ets-300-162-e1-2003>

Foreword

This European Telecommunication Standard (ETS) has been produced by the Radio Equipment and Systems (RES) Technical Committee of the European Telecommunications Standards Institute (ETSI), and was adopted, having passed through the ETSI standards approval procedure, (Public Enquiry 19: 1991-05-13 to 1991-10-04, Vote 27: 1992-09-21 to 1992-11-13).

This ETS lays down minimum requirements for VHF radio transmitters and receivers operating on board ships in certain frequency bands allocated to the maritime mobile service, and incorporates the requirements of the relevant recommendations of the International Maritime Organization.

iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST ETS 300 162 E1:2003](https://standards.iteh.ai/catalog/standards/sist/1718379e-50de-4887-8792-6d82a69f497e/sist-ets-300-162-e1-2003)

<https://standards.iteh.ai/catalog/standards/sist/1718379e-50de-4887-8792-6d82a69f497e/sist-ets-300-162-e1-2003>

Blank page

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST ETS 300 162 E1:2003

<https://standards.iteh.ai/catalog/standards/sist/1718379e-50de-4887-8792-6d82a69f497e/sist-ets-300-162-e1-2003>

1 Scope

This ETS states the minimum requirements for VHF transmitters and receivers fitted with a 50 Ω external antenna socket or connector for use on board ships and operating in the bands between 156 and 174 MHz allocated to the maritime mobile service by the Radio Regulations ¹⁾ (see Radio Regulations, Appendices 18 [1] and 19 [2]). The relevant requirements detailed in the references in Clause 2, Normative References are incorporated in this ETS.

2 Normative references

This ETS incorporates by dated or undated reference provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent references to or revisions of any of these publications apply to this ETS only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

- [1] Radio Regulations, Appendix 18 (1990): "Table of Transmitting frequencies in the band 156-174 MHz for Stations in the Maritime Mobile Service".
- [2] Radio Regulations, Appendix 19 (1990): "Technical Characteristics for Transmitters and Receivers used in the Maritime Mobile Service in the band 156-174 MHz".
- [3] CCITT Recommendation E.161 (1988): "Arrangement of figures, letters and symbols on telephones and other devices that can be used for access to a telephone network".
- [4] CEPT Recommendation T/R 34-01: "Specifications for Maritime Mobile Radio equipment".
- [5] CCITT Recommendation P.53 (1988): "Psophometric apparatus for the objective measurement of circuit noise".
- [6] International Convention on Safety of Life at Sea.
- [7] CISPR Publication 16 (1987): "CISPR specification for radio interference measuring apparatus and measuring methods".
- [8] NMEA 0183 Version 2.00: "Standard for interfacing marine electronic devices".

3 General requirements

3.1 Construction

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.

¹⁾ Use in certain inland waterways may impose additional requirements.

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.

Full 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 the Radio Regulations require a separation of 4,6 MHz between the transmitting frequency and the receiving frequency.

The equipment shall be capable of operating on single frequency and two-frequency channels with manual control (simplex). It may also be capable of operating on two-frequency channels without manual control (duplex).

The equipment shall be able to operate on all channels defined in Appendix 18 to the Radio Regulations [1].

Operation on channels 75 and 76 shall be prevented by appropriate means. Additional VHF channels outside those defined by Appendix 18 to the Radio Regulations [1] may also be provided, but means shall be provided to block any or all of these additional channels, as may be required by an Administration, before installation on board ships. It shall not be possible for the user to unblock or block these additional channels.

The equipment shall be so designed that use of channel 70 for purposes other than Digital Selective Calling (DSC) is prevented.

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

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

<https://standards.iteh.ai/catalog/standards/sist/1718379e-50de-4887-8792-6d82a69f497e/sist-ets-300-162-e1-2003>

3.2 Controls and indicators

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

Where practicable, channels 16 and 70 should be distinctively marked. Selection of channel 16, and if possible channel 70, shall preferably be by readily accessible means (e.g. a distinctively marked key). Where an input panel on the equipment for entering the digits 0 - 9 is provided, this shall conform to CCITT Recommendation E.161 [3].

The equipment shall have the following additional controls and indicators:

- on/off switch for the entire installation with a visual indication that the installation is in operation;
- a manual non-locking push to talk switch to operate the transmitter;
- on/off switch for the loudspeaker;
- a switch for reducing transmitter output power to no more than 1 W;
- an audio frequency power volume control;
- a squelch control;
- a control for reducing the brightness of the equipment illumination to zero;
- an output power detector giving a visual indication that the carrier is being produced.

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;
- if the accessible controls are located on a separate console and if there are two or more control consoles, one of the consoles shall have priority over the others. If there are two or more control consoles, the operation of one console shall be indicated on the other consoles.

3.3 Handset and loudspeaker

The equipment shall be fitted with a telephone handset or microphone, and an integral loudspeaker and/or a socket for an external loudspeaker. A handset is required if duplex operation is provided.

It shall be possible to switch off the loudspeaker without causing a variation in the audio frequency power provided to the handset, if supplied.

During transmission in simplex operation the receiver output shall be muted.

During transmission in duplex operation only the handset shall be operative. Measures shall be taken to ensure correct operation when duplex is used and precautions shall be taken to prevent harmful electrical or acoustic feedback which might produce oscillations.

3.4 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.