



SLOVENSKI STANDARD SIST EN 301 688:2001

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ElectroMagnetic Compatibility and Radio Spectrum Matters (ERM); Technical characteristics and methods of measurement for fixed and portable VHF equipment operating on 121,5 MHz and 123,1 MHz

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European Standard (Telecommunications series)

Electromagnetic compatibility and Radio spectrum Matters (ERM); Technical characteristics and methods of measurement for fixed and portable VHF equipment operating on 121,5 MHz and 123,1 MHz

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Foreword

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

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Date of adoption of this EN:	26 May 2000
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1 Scope

The present document specifies the minimum technical requirements for maritime two-way AM VHF radiotelephone apparatus for communications between ships in distress and rescuing aircraft. The standard incorporates relevant provisions of the ITU Radio Regulations [1], of IMO Assembly Resolutions [2] and of Annex 10 to the ICAO Convention [3].

The maritime VHF equipment described in the present document is intended for communications on the aeronautical emergency frequencies 121,5 MHz and 123,1 MHz only.

The present document is applicable to portable and fixed installed equipment.

The intention of the present document is to define equipment that in all respects have mechanical and electrical design, construction and finish in conformance with good engineering practice and that is suitable for use on board ships at sea in distress situations.

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, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.
- A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

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- [1] <https://standards.iteh.ai/catalog/standards/sist/dc9466bf-5a83-4ca2-b2c2-6aed1f32c683/sist-en-301-688-2001>
ITU Radio Regulations.
- [2] IMO International Convention for the Safety Of Life At Sea (SOLAS).
- [3] ICAO Convention on International Civil Aviation, annex 10.
- [4] ETSI ETS 300 225: "Radio Equipment and Systems (RES); Technical characteristics and methods of measurement for survival craft portable VHF radiotelephone apparatus".
- [5] ISO/R 694: "Positioning of magnetic compasses in ships".
- [6] EUROCAE ED-14C: "Environmental conditions and test procedures for airborne equipment".
- [7] ETSI ETR 028: "Radio Equipment and Systems (RES); Uncertainties in the measurement of mobile radio equipment characteristics".

3 Symbols and abbreviations

3.1 Symbols

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

A3E	amplitude modulation with double sideband and full carrier
dBA	acoustic level in dB relative to 2×10^{-5} Pa
dBd	antenna gain in dB relative to dipole radiation

3.2 Abbreviations

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

AM	Amplitude Modulation
emf	electro-motive force
ERP	Effective Radiated Power
EUT	Equipment Under Test
pep	peak envelope power
RF	Radio Frequency
rms	root mean square
SINAD	Signal + Noise + Distortion/Noise + Distortion
VHF	Very High Frequency

4 General requirements

4.1 Construction

Portable equipment shall in one unit comprise at least transmitter, receiver, antenna, battery, operating controls including press-to-transmit switch, microphone and loudspeaker.

For portable equipment, the antenna gain shall be declared by the manufacturer and shall be at least -12 dBd.

Equipment intended for fixed installations shall have an 50 Ω RF socket.

Portable equipment shall be of small size and light in weight.

Portable equipment shall include provision for the connection of external microphone and headset.

The equipment shall have a colour which distinguishes it from the portable VHF equipment specified in ETS 300 225 [4].

The equipment shall be operational within 5 seconds of switching on.

Any part of the equipment required to be checked during inspection or maintenance operations as laid down by the manufacturer, shall be readily accessible.

4.2 Controls

The number of controls shall be the minimum necessary for simple operation. With the possible exception of channel selection, it shall be possible to operate the equipment using only one hand.

The equipment shall be provided with an on-off switch and a visual indication that the equipment is switched on.

The equipment shall be provided with a manual volume control by which the audio output may be varied.

The press-to-transmit switch shall be non-locking and return to standby (receive) mode when released. The time necessary to change from transmission to reception, or vice versa, shall not exceed 0,3 seconds.

The equipment shall have a channel selector and shall clearly indicate which frequency the equipment is set to. The channel switching arrangement shall be such that the time necessary to change from one frequency to the other does not exceed 5 seconds. It shall not be possible to transmit during channel switching operations. Independent selection of transmitting and receiving frequencies shall not be possible. In the transmission mode, the output of the receiver shall be muted.

If the equipment includes a test facility, the switch which operates this facility shall be so designed that it automatically returns to normal position when released.

4.3 Operating frequencies

The equipment shall be capable of operating on the single frequency channels 121,5 MHz and 123,1 MHz only, with manual control (simplex).

The equipment shall operate with class of emission A3E.

4.4 Labelling

The labels on the equipment shall be permanently fixed to the exterior of the equipment.

All controls and indicators shall be clearly labelled.

The labelling shall at least comprise the following information:

- text containing the words: "Only for emergency communications with aircraft";
- brief operating instructions;
- type designation of the equipment and serial number;
- expiry date for any primary batteries;
- for portable equipment, compass safe distance, according to ISO Recommendation 694 Method B [5] or Eurocae [6].

4.5 Power source

For portable equipment, the source of energy shall be a primary battery that may be replaceable by the user without the use of special tools and without degrading the performance of the equipment. In addition, provisions may be made to operate the equipment using an external source of electrical energy.

Fixed radio installation should be powered from the ship's main source of electrical energy. In addition, it should be possible to operate the installation from an alternative source of electrical energy. Alternatively, the source of energy may be a primary battery integrated in the equipment and may be replaceable by the user.

Primary batteries shall have a shelf life of at least 2 years.

Provisions shall be made for protecting the equipment from damage due to accidental reversal of the polarity of the battery or of any external power supply.

The capacity of the primary battery shall be sufficient to operate the equipment continuously for at least 10 hours at normal temperature condition (see subclause 5.4.1) with the following duty cycle:

- 6 seconds transmit without modulation followed by 6 seconds reception with an RF input signal at the nominal frequency of the receiver at a level of +60 dB μ V using normal test modulation (subclause 6.4) with the audio volume control set to give minimum 200 mW output power followed by 48 seconds reception without input signal under muted condition (operational squelch condition).

5 Test conditions, power sources and ambient temperatures

5.1 Determination of the lower extreme test voltage

When determining the capacity of the primary battery, the battery voltage shall be measured at the end of a duration test. During this duration test, when activated, the transmitter should be modulated to give maximum output power (pep at 100 % modulation). However, this measurement would require an acoustic modulation signal and is complicated to perform. This test may therefore be performed with no modulation (unmodulated carrier) of the transmitter during the periods when the transmitter is activated and it is estimated that an 8 hours duration test with the transmitter modulated to 100 % modulation depth corresponds to a 10 hours duration test with the transmitter keyed without modulation. The equipment shall be operated with the following duty cycle:

- 6 seconds transmission without modulation followed by 6 seconds reception with an RF input signal at the nominal frequency of the receiver at a level of +60 dB μ V using normal test modulation (subclause 6.4) with the audio volume control set to give minimum 200 mW output power followed by 48 seconds reception without input signal under muted condition (operational squelch condition).

The lower extreme test voltage is the voltage of the battery at the end of this duration test measured with the transmitter activated.

5.2 Normal and extreme test conditions

Testing of the equipment shall be made under normal test conditions and also, where stated, under extreme test conditions.

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5.3 Test power source

During testing, the equipment shall be supplied from a test power source capable of producing normal and extreme test voltages as specified in subclauses 5.4.2 and 5.5.2. The tests power source shall only be used in measurements where its effect on the test results are negligible. The power source voltage shall be measured at the input terminals of the equipment.

During testing, the power source voltages shall be maintained within a tolerance of ± 3 % relative to the voltage level at the beginning of each test.

5.4 Normal test conditions

5.4.1 Normal temperature and humidity

The normal temperature and humidity conditions for tests shall be a combination of temperature and humidity within the following limits:

- Temperature +15°C to +35°C;
- Relative humidity 20 % to 75 %.

5.4.2 Normal power source

For portable equipment, the normal test voltage shall be the nominal voltage of the battery as declared by the manufacturer.

For fixed installation equipment, the normal test voltage shall be the nominal mains voltage. The frequency of the test voltage shall be 50 Hz \pm 1 Hz.