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Elektromagnetna združljivost (EMC) in zadeve v zvezi z radijskim spektrom (ERM) - Tehnične karakteristike in merilne metode za ladijske stražne sprejemnike za sprejem digitalnega selektivnega klica (DSC) v pomorskih področjih MF, MF/HF in VHF

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

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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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1 Scope

The present document states the minimum operational and performance requirements for shipborne receivers intended to be connected to an external installation, including a decoder for DSC, and used as receivers for watchkeeping DSC on board ships operating in the mobile MF, MF/HF and VHF band allocated in the ITU Radio Regulations [1] to the maritime mobile service, both in connection with distress and safety communication and in connection with general communication.

These requirements include the relevant provisions of the ITU Radio Regulations [1], ITU-R Recommendations M.493-9 [3], M.541-8 [11], M.489-2 [10] and the IMO Resolutions A.803(19), A.804(19), A.806(19) and A.694(17).

The present document specifies also technical characteristics, methods of testing and required test results for dedicated watchkeeping receivers for use with radio installations in the GMDSS as required by chapter IV of the SOLAS.

It covers both receivers with analogue output or with digital DSC signal output interfaces or with both.

DSC watchkeeping receivers may be a separate equipment or be integrated with a DSC or radiotelephone equipment.

For integrated equipment the present document specifies the requirements and methods of testing of the DSC watchkeeping receivers only.

DSC watchkeeping receivers can be either fixed-frequency receivers or, in MF/HF bands, scanning receivers.

Requirements for the DSC equipment or radiotelephone equipment are given in ETS 300 162 [12], ETS 300 373 [14] and ETS 300 338 [13] respectively.

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, subsequent revisions do apply.
- A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

[1] ITU Radio Regulations.

[2] ITU-T Recommendation E.161 (1993): "Arrangement of digits, letters and symbols on telephones and other devices that can be used for gaining access to a telephone network".

[3] ITU-R Recommendation M.493-9 (1997): "Digital selective-calling system for use in the maritime mobile service".

[4] ISO 3791 (1976): "Office machines and data processing equipment -- Keyboard layouts for numeric applications".

[5] IEC 1162-1 (1995): "Maritime navigation and radiocommunication equipment and systems - Digital interfaces - Part 1: Single talker and multiple listeners".

[6] ETR 028: "Radio Equipment and Systems (RES); Uncertainties in the measurement of mobile radio equipment characteristics".

[7] ITU-T Recommendation V.11 (1993): "Electrical characteristic for unbalanced double-current interchange circuits".

[8] IEC 417 (1973): "Graphical symbols for use on equipment. Index, survey and compilation of the single sheets".

[9] ITU-R Recommendation SM.332-4 (1994): "Selectivity of receivers".

[10] ITU-R Recommendation M.489-2: "Technical characteristics of VHF radiotelephone equipment operating in the maritime mobile service in channels spaced by 25 kHz".

[11] ITU-R Recommendation M.541-8 (1997): "Operational procedures for the use of digital selective-calling (DSC) equipment in the maritime mobile service".

[12] ETS 300 162 Ed 2 (1998): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Radiotelephone transmitters and receivers for the maritime mobile service operating in the VHF bands - Technical characteristics and methods of measurement".

[13] ETS 300 338 (1995): "Radio Equipment and Systems (RES); 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".

[14] ETS 300 373 (1995) + A1 (1997): "Radio Equipment and Systems (RES); Technical characteristics and methods of measurements for maritime mobile transmitters and receivers for use in the MF and HF bands".

3 Definitions and abbreviations

3.1 Definitions

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

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

continuous watch: Continuous watch means that the radio watch concerned is not interrupted other than for brief intervals when the ship's receiving capability is impaired or blocked by its own communications or when the facilities are under periodical maintenance or check.

F1B: Frequency modulation with digital information, without a sub-carrier for automatic reception.

G2B: Phase-modulation with digital information, with a sub-carrier for automatic reception.

J2B: Single sideband with digital information, with the use of a modulating sub-carrier for automatic reception, with the carrier suppressed to at least 40 dB below peak envelope power.

performance check: A check of calling sensitivity (see subclause 7.2).

3.2 Abbreviations

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

a.c.	alternating current
d.c.	direct current
DSC	Digital Selective Calling
EUT	Equipment Under Test
e.m.f.	electromotive force
FSK	Frequency Shift Keying
GMDSS	Global Maritime Distress and Safety System
HF	High Frequency
IF	Intermediate Frequency
IMO	International Maritime Organization
MF	Medium Frequency
MF/HF	Medium and High Frequency

RF	Radio Frequency
r.m.s.	root mean square
SOLAS	(International Convention for the) Safety of Life at Sea
VHF	Very High Frequency

4 General and operational requirements

4.1 General

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

4.2 Construction

4.2.1 General

The equipment shall be so constructed that it is capable of keeping continuous watch on relevant DSC channels (see subclause 5.1) and of being operated readily.

4.2.2 Design

In all respects the mechanical and electrical design and construction and the finish of the equipment shall conform with good engineering practice, and the equipment shall be suitable for use on board ships at sea.

The equipment shall be designed for continuous operation.

4.2.3 Accessibility

All parts of the equipment that are subject to inspection and maintenance adjustments, shall be easily accessible. Components shall be easily identifiable either by markings within the equipment, or with the aid of technical descriptions.

4.2.4 Calibration and maintenance

The equipment shall be so constructed that its main modules can easily be replaced and put into operation without elaborate recalibration or readjustment.

4.2.5 Antenna static protection

In order to protect against damage due to static voltages that may appear at the input of the receiver, there shall be a d.c. path from the antenna terminal to ground not exceeding 100 kΩ.

4.2.6 Digital input panels

Where a digital input panel with the digits "0" to "9" is provided, the digits should be arranged to conform with ITU-T Recommendation E.161 [2]. However, where an alphanumeric keyboard layout, as used on office machinery and data processing equipment, is provided, the digits "0" to "9" may, alternatively, be arranged to conform with ISO 3791 [4].

4.3 Controls and indicators

4.3.1 General

The number of operational controls, their design and manner of functioning, location, arrangement and size should provide for simple, quick and efficient operation. All operational controls shall permit normal adjustments to be easily performed and shall be arranged in a manner which minimizes the risk of inadvertent activation.

4.3.2 Identification

All operational controls and indicators shall be easy to identify and read from the position at which the equipment is normally operated.

The controls and indicators shall be identified in English. Symbols as specified in IEC 417 [8] may be used in addition.

4.3.3 Protection against possible maladjustment

Controls not required for normal operation shall not be readily accessible.

Operational controls, the inadvertent exercise of which could switch off the equipment, lead to its performance degradation or to false indications not obvious to the operator, shall be protected especially against unintentional operation.

4.3.4 Light sources

Equipment with controls and indicators shall be provided with adequate adjustable illumination to enable identification of controls and facilitate reading of indicators at all times. Means shall be provided for dimming the output of any equipment light source.

4.3.5 Operation

The equipment shall be so designed that misuse of the controls cannot cause injury to personnel.

4.4 Software

Facilities shall be provided to protect all operational software incorporated in the equipment.

Any software required in an equipment to facilitate operation, including that for its initial activation/reactivation, shall be permanently installed within the equipment, in such a way that it is not possible for the user to have access to this software.

Means shall be provided to monitor the operation of the equipment at appropriate regular intervals and to activate an alarm or signal in the event of a failure which is not recoverable automatically.

4.5 Memory

Pre-programmed DSC distress calling frequencies and information inherent to the operation of the equipment shall be stored in non-volatile devices.

If the equipment contains information in operator programmable memory devices, such devices shall be protected from interruptions in the power supply up to at least 10 hours duration.

4.6 Interfaces

The equipment submitted for test, when integrated with a DSC or radiotelephone equipment, shall be provided with an accessible test point at the watchkeeping receiver analog or digital signal output.