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European Standard (Telecommunications series)

**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 4: Class E DSC**

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Foreword

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

The present document is part 4 of a multi-part deliverable covering Digital Selective Calling (DSC), as identified below:

Part 1: "Common requirements";

Part 2: "Class A/B DSC";

Part 3: "Class D DSC";

Part 4: "Class E DSC".

The present document covers the operator interfaces and operating system for Class E DSC equipment.

National transposition dates

Date of adoption of this EN:	1 February 2010
Date of latest announcement of this EN (doa):	31 May 2010
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	30 November 2010
Date of withdrawal of any conflicting National Standard (dow):	30 November 2010

1 Scope

The present document states the minimum requirements for general communication for shipborne fixed installations using DSC - class E.

Class E DSC is intended to be used in the Medium Frequency (MF) and/or High Frequency (HF) bands of the Maritime Mobile Service (MMS), for distress, urgency and safety communication and general communications and uses telephony for subsequent communications.

The present document is part 4 of a multi-part deliverable that covers the requirements to be fulfilled by equipment that is either integrated with a transmitter and/or a receiver or equipment that is a stand-alone DSC terminal.

These requirements include the relevant provisions and the guidelines of the IMO as detailed in MSC/Circ.803 [i.1] for non-SOLAS vessels participating in the GMDSS as well as Commission Decision of 4 September 2003 (2004/71/EC [3]).

2 References

References are either specific (identified by date of publication and/or edition number or version number) or non-specific.

- For a specific reference, subsequent revisions do not apply.
- Non-specific reference may be made only to a complete document or a part thereof and only in the following cases:
 - if it is accepted that it will be possible to use all future changes of the referenced document for the purposes of the referring document;
 - for informative references

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2.1 Normative references

The following referenced documents are indispensable for the application of the present document. For dated references, only the edition cited applies. For non-specific references, the latest edition of the referenced document (including any amendments) applies.

- [1] "ITU Radio Regulations", 2008.
- [2] ITU-R Recommendation M.493-12 (2007): "Digital selective-calling system for use in the maritime mobile service".
- [3] Commission Decision 2004/71/EC of 4 September 2003 on essential requirements relating to marine radio communication equipment which is intended to be used on non-SOLAS vessels and to participate in the Global Maritime Distress and Safety System (GMDSS).

2.2 Informative references

The following referenced documents are not essential to the use of the present document but they assist the user with regard to a particular subject area. For non-specific references, the latest version of the referenced document (including any amendments) applies.

- [i.1] IMO Circular MSC/Circ-803: "Participation of non-SOLAS ships in the Global Maritime Distress and Safety System (GMDSS)".
- [i.2] ETSI EN 300 338-1: "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 1: Common requirements".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in EN 300 338-1 [i.2] and the following apply:

acknowledged: automated procedure it indicates that the objective of the initial DSC message has been achieved

active: automated procedure which has control of the general receiver and transmitter and is thus able to engage in subsequent communications and receive DSC messages on both the watch receiver and general receiver

automated procedure: set of actions necessary to complete the objective of an initiating DSC message or non DSC communication event

NOTE 1: Four DSC automated procedures are designed to process these. They are the receiving of distress DSC messages, the receiving of non distress DSC messages, the sending of distress DSC alert attempts and the sending of non distress DSC messages. In addition a fifth procedure is designed to handle non DSC communication events.

NOTE 2: These automated procedures are called:

- Received distress automated procedure.
- Sending distress automated procedure.
- Received non-distress automated procedure.
- Sending non-distress automated procedure.
- Communications automated procedure.

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

class E: intended to provide minimum facilities for MF/HF DSC distress, urgency and safety as well as routine calling and reception, not necessarily in full accordance with IMO GMDSS carriage requirements for MF installations

default: value selected or an action taken by the equipment software in the absence of any operator input

distress DSC message: DSC message or acknowledgement containing the distress information

distress event: unique distress situation identified by two parameters of the distress information; the MMSI of the vessel in distress and the nature of distress

engaged: used to indicate that the equipment is busy handling an automated procedure

factory default: default value that is set by the manufacturer such that the field or behaviour is defined prior to any operator intervention

general receiver: transceiver used for the reception of all subsequent communications

NOTE: It is important to distinguish this unit from the watch receiver.

information characters: set of symbols in a DSC message that contains the items of interest for the recipient and is used to compute the ECC symbol that terminates the message

NOTE: These symbols are repeated in the DX/RX time diversity pattern.

initial DSC message: DSC message that starts an automated procedure

non distress DSC message: DSC messages or acknowledgments that do not have the format specifier or category of "distress"

objective: when in reference to a DSC message or automated procedure, the goal or intent of the item

NOTE: Usually this goal or intent is to establish subsequent communications or request information.

operator options: any choices the operator can make while the automated procedure is engaged

pertinent to the automated procedure: expression used primarily with reference to DSC messages to indicate that the message has something to do with the procedure and is therefore 'handled' by the procedure

NOTE: A DSC message is pertinent to an automated procedure if the set of information characters in the DSC message has the correct values.

pertinent to the station: any DSC message that would start an automated procedure if the radio were in standby

self-terminating alarm: short alarm that stops by itself without operator intervention

NOTE: The purpose of this alarm is to inform the operator that a DSC message is received but it does not require his immediate attention.

symbol (as part of the DSC sentence): 7 binary bits of a 10 bit DSC word that have the information content

top level: means that items, buttons, or functions are present and visible without requiring any action by the operator (such as scrolling, opening up menus, or removing any obscuring covers, etc.)

two-tone alarm: alarm consisting of a repetition of the 2 200 Hz frequency for 250 ms followed by a 1 300 Hz frequency for 250 ms

NOTE: This alarm is used for the initiation of the received distress DSC automated procedure.

urgency alarm: alarm consisting of a repetition of the 2 200 Hz frequency for 250 ms followed by 250 ms period of silence

NOTE: This alarm is used for the initiation of the received non distress DSC automated procedure when the category of the initiating DSC message is "urgency".

watch receiver: separate receiver in DSC radios that continuously monitors the appropriate MF, HF or MF and HF DSC distress frequencies

word (as part of the DSC sentence): used to describe the 10 binary bits that make up the coded entities of a transmitted DSC message

NOTE: The 10 bits consist of a 7 bit "symbol" that gives the information content and 3 bit error check that gives the number of 0 binary bits in the 7 bit symbol.

3.2 Abbreviations

For the purposes of the present document, the abbreviations given in EN 300 338-1 [i.2] apply.

4 Controls and Indicators in Class E DSC Equipment

4.1 Visual indication

Any visual display of the information content shall be clearly legible under all ambient light conditions.

4.1.1 Primary DSC alphanumeric display

The display characters shall have a minimum height of 3,5 mm, and a nominal character width/height ratio of 0,7.

The display shall have a minimum of 12 characters per line and a minimum of 32 characters total.

Any displayed information shall be static. Horizontal scrolling techniques are not permitted (see clause 4.1.3).

The display shall be capable of:

- prompting the operator if an incorrect operation is attempted;
- displaying error messages;
- displaying incoming and logged calls in plain language;
- displaying all the user programmable information content of a DSC call.

4.1.1.1 Additional display information

Additional display characters or symbols shall be capable of:

- showing the functions and options currently available;
- displaying that unread received DSC calls are present in memory;
- displaying other visual alarms;
- displaying whether the position and time information is automatically entered or manually entered.

For integrated equipment there shall be additional display characters and symbols as required for displaying operating frequency, channel number and other radio parameters.

Where logic flows and procedural guidance, expressed by graphical symbols, have an advantage over text, this shall be allowed. Any graphical symbols shall be clearly defined in the operation manual.

4.1.2 Display requirements for additional controllers

Where the additional controller is a fixed installation, it shall have exactly the same characteristics as the primary controller, including the display.

Where the additional controller is a handheld device, it shall have exactly the same characteristics as the primary controller, except for the display, which may be scaled down for a minimum character height of 2 mm.

4.1.3 Handling visual information

In case all information, or user options, required for the active automated procedure, cannot be contained on a single screen, means shall be available to inform the user:

- a) that more information is available;
- b) how to select the relevant information not yet displayed, e.g. by means of a next button or info key.

5 Technical requirements

5.1 Facilities for DSC transmission and reception

5.1.1 Watch receiver capabilities

The watchkeeping receiver part of the DSC equipment shall be designed for continuous operation on:

- MF equipment: 2 187,5 kHz;
- HF equipment: 8 414,5 kHz; 4 207,5 kHz, 6 312 kHz, 12 577 kHz and 16 804,5 kHz.

The watchkeeping receiver need not operate when the transmitter is in use.

The user may be permitted to deselect up to three of the following frequencies as appropriate for propagation reasons:

- 4 207,5 kHz;
- 6 312 kHz;
- 12 577 kHz; and
- 16 804,5 kHz.

5.2 Facilities for coding and decoding of DSC

5.2.1 Call functions

The facilities for coding and composition of calls shall be so arranged that it is possible for the operator quickly and precisely to enter a call. The types of DSC calls provided in this equipment are specified in clause 5.2.4.

The CALL functions shall permit selection of the following functions:

- **INDIVIDUAL**: for making a call to a specific MMSI;
- **GROUP**: for making a call to a specific Group MMSI;
- **GEOGRAPHIC**: for making geographic area calls;
- **RECEIVED CALLS**: for retrieving stored incoming DSC calls;
- **OTHER**: for equipment housekeeping functions.

5.2.2 INDIVIDUAL calls

The INDIVIDUAL call facility shall permit either the MANUAL entry of a MMSI or the selection of a station from the DIRECTORY list. The DIRECTORY list shall have a facility for at least 10 entries. Their MMSIs shall be programmable. If the called station is a coast station (i.e. MMSI commencing 00) no further information shall be requested from the operator. If the called station is a ship station the equipment shall request input of a channel number. The equipment shall assist the operator by suggesting a suitable inter-ship channel as defined in appendix 17 of the Radio Regulations [1].

5.2.3 GEOGRAPHIC area calls

It shall be possible to transmit GEOGRAPHIC calls by means of deliberate actions, such as two levels of menu instructions.

The operator shall be able to select either Urgency or Safety category and the equipment shall propose the default working frequency of 2 182 kHz for MF equipment or 8 291 kHz for HF equipment (the operator shall have the option to change the frequency).

After the transmission of the GEOGRAPHIC call, the equipment shall automatically tune to selected working frequency and select the maximum transmitter power.

5.2.4 DSC call functionality

The following DSC calls shall be available in the equipment.

Table 1

CALL TYPE	Tx	Rx	Format specifier	Notes
Distress alert (RT)	Y	Y	112	
Distress alert (FEC)	N	Y	112	Subsequent comms 113
Distress acknowledgement (RT)	#	Y	116	
Distress acknowledgement (FEC)	N	Y	116	Subsequent comms 113
Distress relay individual (RT)	#	Y	120	This includes DROBOSE
Distress relay Individual (FEC)	#	Y	120	Subsequent comms 113
Distress relay Geographic area (RT)	#	Y	102	
Distress relay Geographic area (FEC)	#	Y	102	Subsequent comms 113
Distress relay All Ships (RT)	#	O	116	
Distress relay All Ships (FEC)	#	O	116	Subsequent comms 113
Distress relay ACK Individual (RT)	#	Y	120	
Distress relay ACK All Ships (RT)	#	O	116	
Distress relay ACK Individual (FEC)	#	Y	120	
Distress relay ACK All Ships (FEC)	#	O	116	
Geographic area RT call	Y	Y	102	Urgency (110) and Safety (108) only
Individual RT call	N	Y	120	Urgency (110) and Safety (108) only
Individual RT call acknowledgement	Y	N	120	Urgency (110) and Safety (108) only
Individual RT call acknowledgement "unable to comply"	Y	N	120	Urgency (110) and Safety (108) only
Individual test call	Y	Y	120	Safety (108) only
Individual test call acknowledgement	Y	Y	120	Safety (108) only
Routine group call RT	Y	Y	114	
Routine individual RT call	Y	Y	120	
Routine individual RT call with position	Y	N	120	
Routine individual RT ACK	Y	Y	120	
Distress Alert Cancel	Y	Y	112	This is the 'self addressed' distress ACK

If any other calls, not listed in the table above, are implemented in the device, they shall comply with tables 4.1 to 4.10.2 of ITU-R Recommendation M.493-12 [2]. Individual routine category polling and position calls from previous versions of ITU-R Recommendation M.493 may be implemented for the sake of reverse compatibility.

Call types marked # shall not be available in the equipment.

Call types marked Y shall be available in the equipment.

Call types marked N are not required to be available in the equipment.

Call types marked O are for reverse compatibility with older equipment.