

# ETSI EN 301 843-4 V2.2.1 (2017-11)



**ElectroMagnetic Compatibility (EMC) standard  
for marine radio equipment and services;  
Harmonised Standard for electromagnetic compatibility;  
Part 4: Specific conditions for  
Narrow-Band Direct-Printing (NBDP) NAVTEX receivers**

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# Foreword

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

The present document has been prepared under the Commission's standardisation request C(2015) 5376 final [i.4] to provide one voluntary means of conforming to the essential requirements of Directive 2014/53/EU 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.1].

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.

The present document is part 4 of a multi-part deliverable. Full details of the entire series can be found in part 1 [1].

## National transposition dates

Date of adoption of this EN:	17 October 2017
Date of latest announcement of this EN (doa):	31 January 2018
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	31 July 2018
Date of withdrawal of any conflicting National Standard (dow):	31 July 2019

# 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).

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# 1 Scope

The present document together with ETSI EN 301 843-1 [1] covers the assessment of Narrow-Band Direct-Printing (NBDP) NAVTEX receivers operating in the maritime mobile service, and ancillary equipment in respect of ElectroMagnetic Compatibility (EMC).

Technical specifications related to the antenna port and emissions from the enclosure port of NAVTEX receivers are not included in the present document. Such technical specifications are found in the related product standard ETSI EN 300 065 [i.2] for the effective use of the radio spectrum.

The present document specifies the applicable test conditions, performance assessment and performance criteria for NAVTEX receivers operating in the maritime mobile service and the associated ancillary equipment.

In case of differences (for instance concerning special conditions, definitions, abbreviations) between the present document and ETSI EN 301 843-1 [1], the provisions of the present document take precedence.

The electromagnetic environment used in the present document to develop the technical specifications encompasses the electromagnetic environment on-board ships as identified in IEC EN 60945 [i.3].

NOTE: The relationship between the present document and essential requirements of article 3.1b of Directive 2014/53/EU [i.1] is given in annex A.

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## 2 References

### 2.1 Normative references

References are specific, identified by date of publication and/or edition number or version number. Only the cited version applies.

Referenced documents which are not found to be publicly available in the expected location might be found at <https://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] ETSI EN 301 843-1 (V2.2.1) (11-2017): "ElectroMagnetic Compatibility (EMC) standard for marine radio equipment and services; Harmonised Standard for electromagnetic compatibility; Part 1: Common technical requirements".

### 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.

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 not necessary for the application of the present document but they assist the user with regard to a particular subject area.

- [i.1] 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.2] ETSI EN 300 065 (V2.1.2): "Narrow-band direct-printing telegraph equipment for receiving meteorological or navigational information (NAVTEX); Harmonised Standard covering the essential requirements of articles 3.2 and 3.3(g) of the Directive 2014/53/EU".

- [i.3] IEC EN 60945 (2002-10-01) + Corrigendum 1 (2008): "Maritime navigation and radiocommunication equipment and systems - General requirements - Methods of testing and required test results".
- [i.4] Commission Implementing Decision C(2015) 5376 final of 4.8.2015 on a standardisation request to the European Committee for Electrotechnical Standardisation and to the European Telecommunications Standards Institute as regards radio equipment in support of Directive 2014/53/EU of the European Parliament and of the Council.

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## 3 Definitions, symbols and abbreviations

### 3.1 Definitions

For the purposes of the present document, the terms and definitions given in ETSI EN 301 843-1 [1] apply.

### 3.2 Symbols

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

emf	electromotive force
rms	root mean square

### 3.3 Abbreviations

For the purposes of the present document, the abbreviations given in ETSI EN 301 843-1 [1] and the following apply:

CER	Character Error Rate
EFTA	European Free Trade Association
EMC	ElectroMagnetic Compatibility
EUT	Equipment Under Test
NAVTEX	Navigational Telex
NBDP	Narrow-Band Direct-Printing
RF	Radio Frequency

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## 4 General and operational requirements

### 4.1 Environmental profile

The provisions of ETSI EN 301 843-1 [1], clause 4.1 shall apply with the following modifications.

For emission and immunity tests the normal test modulation, test arrangements, etc., as specified in the present document, clauses 4.1 to 4.5, shall apply.

All tests shall be performed with the wanted RF input signal on the operating frequency 490 kHz or 518 kHz as appropriate, unless stated otherwise.

### 4.2 Arrangements for test signals

#### 4.2.0 General

The provisions of ETSI EN 301 843-1 [1], clause 4.2 shall apply.

### 4.2.1 Arrangements for test signals at the input of the receiver

The provisions of ETSI EN 301 843-1 [1], clause 4.2.3 shall apply with the following modifications.

The wanted RF input signal, coupled to the receiver, shall be modulated with normal test modulation as specified for that type of equipment (see clause 4.5).

The level of the wanted signal shall be 40 dB $\mu$ V (emf) unless indicated otherwise.

### 4.2.2 Arrangements for test signals at the output of the receiver

The output of the receiver consists of the printout of transmitted messages.

During immunity tests with continuous RF test signals, the output of the receiver shall be monitored, e.g. by means of a camera coupled to a monitor located outside the test environment, for the verification of continuous printing.

## 4.3 Exclusion bands

### 4.3.0 General

The frequencies on which NAVTEX receivers are intended to operate, shall be excluded from conducted and radiated RF immunity tests.

There shall be no frequency exclusion band applied to emission measurements of NAVTEX receivers, and/or associated ancillary equipment.

The immunity test exclusions are referred to as "exclusion band" and are defined in clause 4.3.1.

### 4.3.1 Exclusion bands for receivers

The exclusion band for NAVTEX receivers is the frequency range 462 kHz to 545 kHz.

## 4.4 Narrow band responses on receivers

The provision of ETSI EN 301 843-1 [1], clause 4.4 shall apply with the following modifications.

No immunity tests shall be carried out on frequencies of identified narrow band responses on NAVTEX receivers.

An increase of the Character Error Rate (CER) above the value of  $4 \times 10^{-2}$  shall be used as criterion for the identification of any unwanted responses.

The nominal frequency offset to be used for the identification of narrowband responses shall be  $\pm 1$  kHz for the first part of the identification procedure, and  $\pm 1,25$  kHz for its second part.

All narrowband responses shall be disregarded from immunity tests.

## 4.5 Normal test modulation

The normal wanted RF test signal shall be an F1B radio-frequency signal modulated with a frequency shift of  $\pm 85$  Hz centred on 490 kHz or 518 kHz as appropriate.

It shall contain signals providing the following traffic information:

- 1 2 3 4 5 6 7 8 9 0 A B C D E F G H I J K L M N O P Q R S T U - Carriage return - Line feed.

For tests with the normal wanted RF test signal, the above information shall be transmitted at least 35 times continuously.



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## 5 Performance assessment

### 5.1 General

The manufacturer shall at the time of submission of the equipment for test, supply the necessary general information as requested in ETSI EN 301 843-1 [1], clause 5.1.

### 5.2 Equipment which can provide a continuous communication link

The provisions of ETSI EN 301 843-1 [1], clause 5.2 shall apply with the following modification.

For immunity tests, the wanted input signal, coupled to the receiver, shall be the normal wanted RF test signal (see clause 4.5). Before each test, this signal (see clause 4.5) shall be applied to the EUT to check the correct functioning and to load the message header memory. The user memories shall be loaded with appropriate test data. During the immunity tests, the normal wanted RF test signal shall be preceded by a different header.

### 5.3 Equipment which does not provide a continuous communication link

The provisions of ETSI EN 301 843-1 [1], clause 5.3 shall apply.

### 5.4 Ancillary equipment

The provisions of ETSI EN 301 843-1 [1], clause 5.4 shall apply.

### 5.5 Equipment classification

NAVTEX receivers belong solely to the category of mobile marine radio equipment.

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## 6 Performance criteria

### 6.0 General

For immunity tests, the wanted input signal, coupled to the receiver, shall be the normal wanted RF test signal (see clause 4.5). Before each test, this signal (see clause 4.5) shall be applied to the EUT to check the correct functioning and to load the message header memory. The user memories shall be loaded with appropriate test data. During the immunity tests, the normal wanted RF test signal shall be preceded by a different header.

The equipment shall meet the performance criteria as specified in clauses 6.1 to 6.5, as appropriate.

### 6.1 Performance criteria A for continuous phenomena applied to receivers

During the test the EUT shall continue to print.

After the test the print shall be examined. The Character Error Rate (CER) in the printed output shall be below  $4 \times 10^{-2}$ .

After the test the wanted RF test signal shall be applied to the EUT using the same header as used preceding the test. The test signal shall not be printed.