



# AMENDMENT

**ETS 300 373**

**A1**

**August 1997**

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**Key words:** Maritime, radio, telephony

**This amendment A1 modifies  
the European Telecommunication Standard ETS 300 373 (1995)**

**Radio Equipment and Systems (RES);  
Technical characteristics and methods of measurement for  
maritime mobile transmitters and receivers for  
use in the MF and HF bands**

**URGENT TECHNICAL CORRECTION**

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## Foreword

This amendment to ETS 300 373 (1995) has been produced by the Radio Equipment and Systems (RES) Technical Committee of the European Telecommunications Standards Institute (ETSI).

<b>Transposition dates</b>	
Date of adoption of this amendment:	8 August 1997
Date of latest announcement of this amendment (doa):	30 November 1997
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Date of withdrawal of any conflicting National Standard (dow):	31 May 1998

## Amendments

### 4.2.1 General

*Replace entire subclause with the following:*

All controls shall be easily identified from the position at which the operator operates the equipment.

The number of operational controls, their design and manner of functioning, location, arrangement and size should provide for simple, quick and efficient operation. Controls which are not necessary for normal operation shall not be readily accessible to the operator.

The controls should be arranged in a manner which minimizes the risk of inadvertent operation.

For transmitters it shall be possible to change the transmitter from any class of emission to another for which it is designed to operate by means of not more than one control.

For receivers the class of emission shall be selectable by not more than one control.

### 4.3.3 Distress frequencies

*Replace entire subclause with the following:*

The distress frequencies shown in table 1 which are applicable to the equipment, shall be clearly indicated, either on the front panel of the equipment or on an instruction label supplied with the equipment.

**Table 1: Distress frequencies**

DSC (kHz)	Telephony (kHz)	Telex (kHz)
2 187,5	2 182	2 174,5
4 207,5	4 125	4 177,5
6 312	6 215	6 268
8 414,5	8 291	8 376,5
12 577	12 290	12 520
16 804,5	16 420	16 695
NOTE: The above DSC and telex frequencies are assigned frequencies whereas the carrier frequency is indicated for telephony.		

In addition, manual controls necessary for the tuning of the equipment to the relevant frequencies in table 1, and their settings, shall be clearly indicated.

### 4.5 Classes of emission

*Replace entire subclause with the following:*

The equipment shall provide for the transmission and/or reception of signals using the classes of emission defined below, as appropriate to the equipment:

J3E SSB telephony, with the carrier suppressed at least 40 dB below peak envelope power;

H3E SSB telephony on the frequency 2 182 kHz only with the carrier 4,5 dB - 6 dB below peak envelope power. For on-board test purposes, using only a dummy load, facilities shall be provided for H3E operation on the frequency of 2 200 kHz;

F1B FSK suitable for DSC with a frequency shift of  $\pm 85$  Hz. Alternatively class of modulation J2B can be used with a 1 700 Hz sub-carrier. In this case the equipment shall be tuned to a carrier frequency 1 700 Hz below the assigned frequency.

The receiver may also provide for the reception of signals of other classes of emission.

## 5 Test conditions

*Add the following:*

When preparing test report forms for equipment tested in accordance with this ETS, the point where the DC voltage is measured shall be specified (see subclause 5.2).

### 5.7.1 Measurement uncertainty

*Replace entire subclause with the following:*

Parameter	Maximum value of measurement uncertainty
RF frequency:	$\pm 1 \times 10^{-8}$
RF Power, PEP in 50 $\Omega$	$\pm 1,5$ dB
RF Power, PEP in 10 $\Omega$ / 250 pF	$\pm 2,5$ dB
Conducted spurious emissions of transmitter:	$\pm 4$ dB
Audio output power:	$\pm 0,5$ dB
Sensitivity of receiver:	$\pm 3$ dB
Conducted emission of receiver:	$\pm 3$ dB
Two signal measurement:	$\pm 4$ dB
Three signal measurement:	$\pm 3$ dB

For the test methods according to this ETS the uncertainty figures are valid to a confidence level of 95 % calculated according to the methods described in ETR 028 [8].

### 6.3 Performance check

*Replace entire subclause with the following:*

For the purpose of this ETS, the term "performance check" shall be taken to mean the following measurements and limits:

for the transmitter:

- frequency error:

With the transmitter connected to an artificial antenna (see subclause 5.5), the transmitter shall be tuned to the frequency 2 182 kHz and operated in H3E mode. The transmitter frequency shall be within  $\pm 10$  Hz of 2 182 kHz;

- output power:

With the transmitter connected to an artificial antenna (see subclause 5.5), the transmitter shall be tuned to the frequency 2 182 kHz and operated in H3E mode. When keyed without modulation, the output power of the transmitter (carrier power) shall be within 15 W and 140 W;

- for the receiver:

- maximum usable sensitivity.

With the AGC operative, the receiver shall be adjusted to 2 182 kHz and operated in H3E mode. A test signal as specified in subclause 5.6.2.2 shall be applied. The level of the input signal shall be adjusted until the SINAD at the output of the receiver is 20 dB, and the output power is at least the standard output power (see subclause 8.1.1). The level of the input signal shall be not greater than + 36 dB $\mu$ V.

### 7.3.3.3 Intermodulation products for SSB telephony modes

*Replace entire subclause with the following:*

The value of intermodulation products shall not exceed 25 dB below the highest of the two tones under normal test conditions.

### 7.4.2 Method of measurement

*Replace entire subclause with the following:*

The transmitter complete with chassis covers and shock absorbers (if supplied) shall be clamped in its normal operating position to a vibrating table and shall be connected to the appropriate artificial antenna as specified in subclause 5.5.1.

The transmitter shall then be switched on, adjusted for the transmission of class of emission J3E and, after the warming-up period permitted under subclause 4.7, shall be modulated by means of a test signal consisting of an audio frequency tone applied to the modulation input at a frequency of 1 000 Hz for SSB telephony or 1 700 Hz for DSC.

The level of the input test signal shall be adjusted to such a level that the output power is 3 dB below the result of the power measurement in subclause 7.3.

Any frequency deviation shall be measured by means of a monitoring receiver using a suitable, calibrated, FM demodulator or frequency deviation meter. The deviation meter bandwidth shall be  $\pm 125$  Hz. The table shall be vibrated as detailed in subclause 6.4.

The test shall be performed on 2 182 kHz if the transmitter is designed to work in the 1 605 kHz - 4 000 kHz band only or on a frequency in the 8 MHz band if the equipment is designed to work on all maritime bands in the 1 605 kHz - 27 500 kHz range.

### 7.6.2 Method of measurement

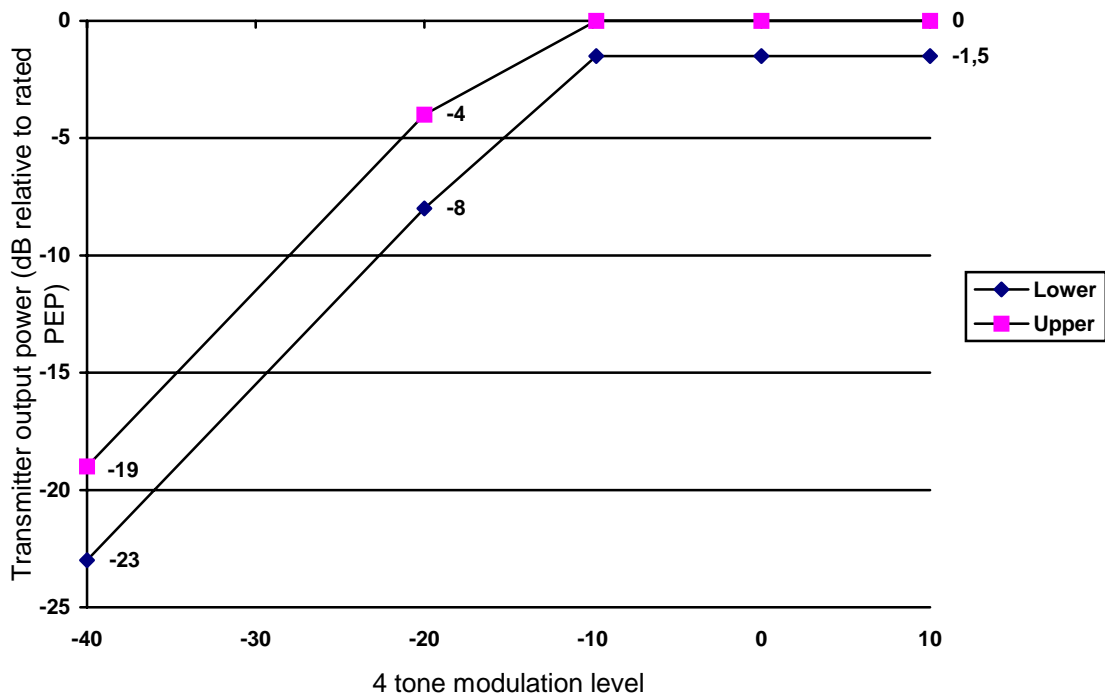
*Replace entire subclause with the following:*

An audio tone with a frequency of 1 000 Hz and a level of -16 dBm shall be applied to the 600  $\Omega$  line input terminals.

**7.7.2 Limits**

*Replace entire subclause with the following:*

The graph shall lie within the limits given in figure 2.



**Figure 2: Limits**

**7.10.2 Method of measurement**

*Replace entire subclause with the following:*

The transmitter shall be connected to a 50 Ω power attenuator. The modulation input shall be terminated by a 600 Ω termination, and the transmitter shall be placed in the transmit mode.

The spurious emissions shall be measured from 9 kHz to 4 GHz. The frequencies ± 12 kHz of the assigned frequency shall be excluded from this transmitter test.

Any limiter or automatic control of the modulation level shall be in normal operation.

For stand-alone transmitters this test shall be repeated in the transmitter stand-by mode. The frequencies within the centre frequency  $f_c$  and  $f_c + 2,7$  kHz shall be excluded from this transmitter test.

**7.10.3 Limits**

*Replace entire subclause with the following:*

The power of any conducted spurious emission at the antenna port shall be in accordance with table 3.

**Table 3: Limits for conducted spurious emissions**

Frequency range	Minimum attenuation below peak envelope power in Tx mode	Power in the Tx standby mode
9 kHz to 2 GHz	43 dB without exceeding the power of 50 mW	2 nW
>2 GHz to 4 GHz	43 dB without exceeding the power of 50 mW	20 nW

**7.16.3.3 Limit**

*Replace entire subclause with the following:*

The modulation depth shall be between 70 % and 100 %. The variation between the two tones shall be less than 1,2 to 1.

**8.3.2 Method of measurement**

*Replace entire subclause with the following:*

The receiver, complete with chassis covers and shock absorbers (if supplied), shall be clamped in its normal operating position to a vibrating table.

The receiver shall then be switched on, adjusted for the reception of class of emission J3E and after the warming-up period permitted under subclause 4.7 a radio frequency test signal as detailed in subclause 5.6.2.3 shall be applied to its input at a level of + 60 dBµV.

The receiver shall be adjusted to deliver standard output power at 1 kHz. The table shall be vibrated as detailed in subclause 6.4.1. Any frequency deviation of the output signal occurring during this test, shall be measured using a suitable, calibrated, FM demodulator. The deviation meter bandwidth shall be ± 125 Hz.

If the receiver does not have telephony facilities then the same test is performed using the reception of class of emission F1B with the appropriate test signal at the same levels but with an output frequency of 1 700 Hz.

**8.5.3 Limits**

*Replace entire subclause with the following:*

The maximum usable sensitivity shall be better than the values given in table 4.

**Table 4: Limits of maximum usable sensitivity**

Frequency range and class of emission	Maximum level of input of input signal (dBµV) 50 Ω or 10 Ω and 250 pF source impedance		
	Normal conditions	Extreme conditions	
1 605 - 4 000 kHz			
	J3E	+ 16	+ 22
	H3E	+ 30	+ 36
4 - 27,5 MHz	F1B	+5	+11
	J3E	+11	+17
	F1B	+ 0	+ 6



### **8.9.2.2 Class of emission H3E**

*Delete entire subclause.*

### **8.11.3 Limits**

*Replace entire subclause with the following:*

#### **Class of emission J3E or H3E and Class of emission F1B (analogue output)**

The spurious response rejection ratio shall not be less than 60 dB.

#### **Class of emission F1B (Digital output)**

The bit error ratio shall be  $10^{-2}$  or better.

### **8.14.2 Methods of measurement**

*Replace entire subclause with the following:*

The receiver antenna port shall be terminated into 50  $\Omega$  and a search shall be made for the presence of signals appearing across the resistor. The measurement shall be made over the frequency range 9 kHz to 4 GHz.

### **8.14.3 Limits**

*Replace entire subclause with the following:*

The power of any discrete component measured into 50  $\Omega$  shall not exceed 2 nW from 9 kHz to 2 GHz and 20 nW from 2 GHz to 4 GHz.

### **8.15.2 Method of measurement**

*Replace entire subclause with the following:*

The receiver shall have no input signal and be terminated at its antenna input with a load impedance equal to those specified in subclause 5.5. The receiver shall be set to J3E mode and a search made throughout the bands for whistles in the output. For conformance testing manufacturers may need to provide a means for quickly searching the bands in steps of no more than 1 kHz.

### **8.16.2.1 Settings**

*Replace entire subclause with the following:*

To check the performance of the AGC, tests shall be carried out with the receiver adjusted for each maritime mobile band. The input signal shall be the appropriate normal test signal specified in subclause 5.6.2. The characteristics shall be checked at all audio outputs.

### **8.18.2 Method of measurement**

*Replace entire subclause with the following:*

An unmodulated radio frequency test signal, at a level of 30 V RMS is applied, in the manner specified in subclause 5.6 to the receiver input for a period of 15 minutes.

The test shall be performed on 2 182 kHz if the equipment is designed to operate in the 1 605 kHz - 4 000 kHz bands only, or on a frequency in the 8 MHz band if the equipment is designed to operate on all maritime bands in the 1 605 kHz - 27 500 kHz range.

## History

Document history	
August 1995	First Edition
April 1997	One-step Approval Procedure OAP 9731: 1997-04-04 to 1997-08-01
August 1997	Amendment 1 to First Edition