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Radio Equipment and Systems (RES); Angle-modulated Citizens Band radio equipment (CEPT PR 27 Radio Equipment); Technical characteristics and methods of measurement

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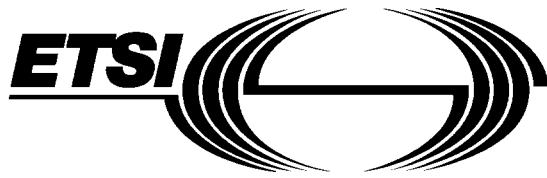
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(CEPT PR 27 Radio Equipment)**
Technical characteristics and methods of measurement

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Foreword

This European Telecommunication Standard (ETS) has been prepared by an Experts' Group of the Radio Equipment and Systems (RES) Technical Committee of the European Telecommunications Standards Institute (ETSI). The standard has undergone the formal ETSI approval process and is now adopted.

This ETS concerns only angle modulation. The existing national Citizens' Band standards or specifications which also permit the use of other forms of modulation (including amplitude and single sideband) will not be affected by the adoption of this ETS.

This standard is based upon CEPT Recommendation T/R 20-02 [1], originally prepared by the CEPT R22 Committee for use by Citizens' Band (CB) radio equipment.

Angle modulation shall be used for radio equipment covered by this standard, with an audio pre-emphasis characteristic for the transmitter, and audio de-emphasis for the receiver.

Administrative arrangements (e.g. for type approval, marking, antennas), and conditions for the use of CB angle modulated radio (CEPT PR 27) are to be found in CEPT Recommendations T/R 20-02 and T/R 20-07 [2].

Every ETS prepared by ETSI is a voluntary standard. This ETS contains text concerning type approval of the equipment to which it relates. This text should be considered only as guidance and does not make this ETS mandatory.

Introduction

This standard is intended to specify the minimum performance and the methods of measurement of Citizens' Band radio equipment (CEPT PR 27) as specified in the Scope.

Clause 5 provides the corresponding limits. These limits have been chosen to ensure an acceptable grade of service and to minimise harmful interference to other equipment and services.

This standard will also be used by European notified accredited test laboratories for the assessment of the performance of the equipment. In order to avoid any ambiguity in that assessment, this standard contains instructions for the presentation of equipment for type testing purposes (Clause 4), measurement methods (Clauses 8 and 9) and conditions (Clauses 6 and 7).

This standard was drafted on the assumption that:

- a) the type test measurements would be performed only once in one of the accredited test laboratories, and then accepted by the various authorities in order to obtain type approval;
- b) if equipment available on the market is required to be checked it shall be tested in accordance with the methods specified in this standard. This standard covers base stations, mobile stations and two categories of hand-portable stations.

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1 Scope

This standard covers the minimum characteristics considered necessary in order to make the best use of the available frequencies. It does not necessarily include all the characteristics which may be required by a user, nor does it necessarily represent the optimum performance achievable. It applies to angle modulated Citizens' Band radio equipment (CEPT PR 27) operation in the frequency band 26.960 MHz to 27.410 MHz with channel separations of 10 kHz, and intended for analogue speech.

This standard applies to equipment with a socket for an external antenna and to equipment with an integral antenna.

In the case of equipment which is intended for use with either an integral antenna or an external antenna, the equipment shall be measured as equipment intended for use with an external antenna and shall meet the appropriate limits. In addition to this, the transmitter characteristics:

- transmitter carrier power,
- spurious emissions of the transmitter,

and the receiver characteristic:

- spurious radiations of the receiver,

shall be measured as for equipment for use with an integral antenna and the appropriate limits shall be met.

2 Normative references

- [1] CEPT Recommendation T/R 20-02 (1972, with subsequent amendments): "Low-power radio transmitter-receivers intended to provide voice radiocommunications in the 27 MHz band (PR 27 Radio Equipment)"
- [2] CEPT Recommendation T/R 20-07 (1982, with subsequent amendment): "Free circulation for use in different countries, of low-power mobile and portable transmitter-receivers in the 27 MHz band (PR 27 equipment Recommendation T/R 20-02)"
- [3] CCITT Recommendation O.41 (1988): "Psophometer for use on the telephone-type circuits"
- [4] CCITT Recommendation T/R 20-09 (1990): "PR27 radio equipment intended to provide short-range voice radiocommunication in the 27 MHz band"

3 Definition, abbreviations and symbols

3.1 Definitions

For the purpose of this standard the following definitions apply.

Base station

Equipment fitted with an antenna socket, for use with an external antenna, and intended for use in a fixed location.

Mobile station

Mobile equipment fitted with an antenna socket, for use with an external antenna, normally used in a vehicle or as a transportable station.

Handportable station

Equipment either fitted with an antenna socket or an integral antenna, or both, normally used on a stand-alone basis, to be carried on a person or held in the hand.

Integral antenna

An antenna designed to be connected to the equipment without the use of a 50 ohm external connector and considered to be part of the equipment. An integral antenna may be fitted internally or externally to the equipment.

Angle modulation

Angle modulation with an audio pre-emphasis characteristic for the transmitter and an audio de-emphasis characteristic for the receiver.

3.2 Abbreviations

SND/ND (signal + noise + distortion)/(noise + distortion)

dBc dB relative to the carrier power

RF radio frequency

IF intermediate frequency

Tx transmitter

Rx receiver

3.3 Symbols

E_o reference field strength, annex A

R_o reference distance, annex A

4 General

4.1 Presentation of equipment for testing purposes

- a) The manufacturer shall provide a production model of the equipment for type approval testing. If type approval is given on the basis of tests on a preliminary model, the corresponding production models shall be identical in all respects with the preliminary model tested;
- b) Tests shall be carried out on the highest and lowest channel within the switching range of the equipment and on a channel near the middle of the switching range. The switching range of the receiver and transmitter shall be declared by the manufacturer. The switching range is the maximum frequency range over which the receiver or the transmitter can be operated without reprogramming or realignment. In the case of equipment fitted with one channel only, all tests are carried out on that channel.

In the case of equipment fitted with two channels, all tests are carried out on both channels.

4.2 Mechanical and electrical design

4.2.1 General

The equipment submitted by the manufacturer or his representative, shall be designed, constructed and manufactured in accordance with sound engineering practice, and with the aim to minimise harmful interference to other equipment and services.

4.2.2 Controls

Those controls which if maladjusted might increase the interfering potentialities of the equipment shall not be accessible to the user.

4.2.3 Marking

The equipment shall be marked in a visible place. This marking shall be legible, tamperproof and durable.

The marking shall include:

- a) the name of the manufacturer or his trade mark;
- b) the type number of designation and serial number;
- c) the type approval number (when allocated by appropriate authorities);
- d) the type approval mark as stated in CEPT Recommendations T/R 20-07 [2] and T/R 20-09 [4].

4.3 Interpretation of the measurement results

The interpretation of the results recorded in a test report when making the measurements described in this standard shall be as follows:

- a) the measured value related to the corresponding limit will be used to decide whether an equipment meets the minimum requirements of the standard;
- b) the inclusion in the test report of the actual measurement uncertainty for each particular measurement is also required;
- c) the values, of the actual measurement uncertainty shall be, for each measurement, equal to or lower than the figures in Clause 10 (table of measurement uncertainty).

NOTE: This procedure for using the Maximum Acceptable Uncertainty Value is valid until superseded by other publications of ETSI covering this subject.

The use of the measured value for comparison with the limit value has been chosen because there is no definitive standard for specifying the measurement uncertainty agreed at the time of publication of this standard. Therefore the measurement uncertainty shall be used as a quality measure of the actual measurement. The use of the Measurement Uncertainty values shall be used by Accreditation Authorities during their accreditation procedures to ensure compliance/conformity with the requirements of type testing to ETSI Standards.

5 Technical characteristics

5.1 Common characteristics

5.1.1 Frequency band

The maximum operating frequency band shall be from 26.960 MHz to 27.410 MHz. Equipment may operate on one or more channels up to a maximum of 40 channels.