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01-september-2011

**Elektromagnetna združljivost in zadeve v zvezi z radijskim spektrom (ERM) -
Radijska oprema CB - 1. del: Tehnične karakteristike in merilne metode**

Electromagnetic compatibility and Radio spectrum Matters (ERM) - Citizens' Band (CB)
radio equipment - Part 1: Technical characteristics and methods of measurement

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European Standard

**Electromagnetic compatibility
and Radio spectrum Matters (ERM);
Citizens' Band (CB) radio equipment;
Part 1: Technical characteristics
and methods of measurement**

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Foreword

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

The present document is part 1 of a multi-part deliverable covering Citizens' Band (CB) radio equipment, as identified below:

Part 1: "Technical characteristics and methods of measurement";

Part 2: "Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive".

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National transposition dates

Date of adoption of this EN:	5 July 2011
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1 Scope

The present document covers the technical requirements for transmitters and receivers used in stations of angle modulated, Double Side Band (DSB) modulated and/or Single Side Band (SSB) modulated Citizens' Band (CB) radio equipment operating in all or part of the frequency band 26,960 MHz to 27,410 MHz with a channel spacing of 10 kHz, and intended for analogue speech and/or data transmission.

Citizens' Band radio equipment operation is in accordance with Draft ECC Decision on the harmonised use of frequencies for Citizens' Band (CB) radio equipment [i.2].

The equipment operates on one or more channels of the carrier frequencies as shown in table 1.

Table 1: Carrier frequencies

Carrier frequencies	Channel Number	Carrier frequencies	Channel Number
26,965 MHz	1	27,215 MHz	21
26,975 MHz	2	27,225 MHz	22
26,985 MHz	3	27,235 MHz	24
27,005 MHz	4	27,245 MHz	25
27,015 MHz	5	27,255 MHz	23
27,025 MHz	6	27,265 MHz	26
27,035 MHz	7	27,275 MHz	27
27,055 MHz	8	27,285 MHz	28
27,065 MHz	9	27,295 MHz	29
27,075 MHz	10	27,305 MHz	30
27,085 MHz	11	27,315 MHz	31
27,105 MHz	12	27,325 MHz	32
27,115 MHz	13	27,335 MHz	33
27,125 MHz	14	27,345 MHz	34
27,135 MHz	15	27,355 MHz	35
27,155 MHz	16	27,365 MHz	36
27,165 MHz	17	27,375 MHz	37
27,175 MHz	18	27,385 MHz	38
27,185 MHz	19	27,395 MHz	39
27,205 MHz	20	27,405 MHz	40

Transmission and reception takes place on the same channel (single frequency simplex mode).

Any equipment using national regulations on Citizens' Band (CB) permitting the use of channels outside of the carrier frequencies shown in table 1 within the frequency range from 26 MHz to 28 MHz can use the present document.

The types of equipment covered by the present document are as follows:

- Base station: equipment fitted with antenna connector.
- Mobile station: equipment fitted with antenna connector.
- Hand portable stations:
 - a) either fitted with an antenna connector; or
 - b) without an external antenna connector but fitted with a permanent internal or a temporary internal 50 Ω RF connector which allows access to the transmitter output and the receiver input.

Hand portable station equipment without an external or internal Radio Frequency (RF) connector and without the possibility of having a temporary internal 50 Ω RF connector is not covered by the present document.

2 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 reference document (including any amendments) applies.

Referenced documents which are not found to be publicly available in the expected location might be found at <http://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.

2.1 Normative references

The following referenced documents are necessary for the application of the present document.

- [1] ETSI TR 100 028 (V1.4.1) (all parts): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics".
- [2] CISPR 16 (2006) (parts 1-1, 1-4 and 1-5): "Specifications for radio disturbance and immunity measuring apparatus and methods; Part 1: Radio disturbance and immunity measuring apparatus".
- [3] ITU-T Recommendation O.41 (1994): "Psophometer for use on telephone-type circuits".

2.2 Informative references

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] ETSI EN 300 135-1: "Electromagnetic compatibility and Radio spectrum Matters (ERM); Land Mobile Service; Citizens' Band (CB) radio equipment; Angle-modulated Citizens' Band radio equipment (PR 27 Radio Equipment); Part 1: Technical characteristics and methods of measurement".
- [i.2] FM38(10)37rev2: "Draft ECC/DEC/(11)XX on the harmonised use of frequencies for Citizen's Band (CB) radio equipment".
- [i.3] ITU Radio Regulations.

3 Definitions, symbols and abbreviations

3.1 Definitions

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

angle modulations: F3E/G3E classes of emission as defined in the ITU Radio Regulations, corresponding to modulation with an audio pre-emphasis characteristic for the FM transmitter and an audio de-emphasis characteristic for the receiver

base station: equipment fitted with an antenna socket, for use with an external antenna, and intended for use in a fixed location

Double Side Band (DSB) modulation: A3E class of emission as defined in the ITU Radio Regulations, corresponding to double side band amplitude modulation

hand portable station: equipment either fitted with an antenna connector 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: antenna designed as a fixed part of the equipment, without the use of an external connector and as such which cannot be disconnected from the equipment by the user

NOTE: An integral antenna may be fitted internally or externally.

mobile station: mobile equipment fitted with an antenna connector, for use with an external antenna, normally used in a vehicle or as a transportable station

Single Side Band (SSB) modulation: J3E class of emission as defined in the Sub-Section IIA of Volume II Appendices of the ITU Radio Regulations [i.3], corresponding to single side band suppressed carrier amplitude modulation, using either USB or LSB

3.2 Symbols

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

λ Wavelength
 E_o Reference field strength

NOTE: See annex A.

R_o Reference distance

NOTE: See annex A.

3.3 Abbreviations

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

AC	Alternating Current
CB	Citizen's Band
DC	Direct Current
DSB	Double Side Band
emf	electromotive force
FM	Frequency Modulation
IF	Intermediate Frequency
ITU	International Telecommunication Union
LSB	Lower Side Band
ND	Noise + Distortion
PEP	Peak Envelope Power
PTT	Push-To-Talk
RF	Radio Frequency
RMS	Root Mean Square
RX	Receiver/reception
SND	Signal + Noise + Distortion
SSB	Single Side Band
TX	Transmitter/Transmission
USB	Upper Side Band

4 General

4.1 Presentation of equipment for testing purposes

Each equipment to be tested shall fulfil the requirements of the present document on all frequencies over which it is intended to operate.

The provider or manufacturer shall declare the frequency ranges, the range of operating conditions and power requirements as applicable, to establish the appropriate test conditions.

The equipment shall be tested to the present document using the type of modulation signal defined in clause 6.5 that is relevant to the operational mode being tested, i.e. angle modulation, DSB or SSB. Angle modulation is considered as equivalent to frequency modulation (FM) with pre-emphasis in transmit mode and de-emphasis in receive mode.

Equipment capable of using two or three types of modulation among angle modulation, DSB and SSB shall be tested to the present document using the respective type of modulation for each mode (see clause 6.5).

Additionally, technical documentation and operating manuals, sufficient to make the test, shall be supplied.

4.1.1 Choice of model for testing

The provider or manufacturer shall provide one or more samples of the equipment, as appropriate for testing.

Stand alone equipment shall be complete with any ancillary equipment needed for testing.

If an equipment has several optional features, considered not to affect the RF parameters then the tests to be performed on the equipment configured with that combination of features considered to be the most complex.

Where practicable, equipment to be tested shall provide a 50 Ω connector for conducted RF power level measurements.

In the case of integral antenna equipment, if the equipment does not have an internal permanent 50 Ω connector then a second sample of the equipment shall be supplied with a temporary antenna connector fitted to facilitate testing.

The performance of the equipment to be tested shall be representative of the performance of the corresponding production model. 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.

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.

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4.1.1.1 Auxiliary test equipment

All necessary test signal sources, setting up instructions and other product information shall accompany the equipment to be tested.

4.1.1.2 Declarations by the provider

The provider or manufacturer shall declare the necessary information of the equipment with respect to all technical requirements set by the present document.

In the case of hand portable equipment without a 50 Ω external antenna connector see clause 4.2.

4.2 Testing of equipment that does not have an external 50 Ω RF connector (integral antenna equipment)

Where equipment has an internal 50 Ω connector it shall be permitted to perform the tests at this connector.

Equipment may also have a temporary internal 50 Ω connector installed for the purposes of testing.

No connection shall be made to any internal permanent or temporary antenna connector during the performance of radiated emissions measurements, unless such action forms an essential part of the normal intended operation of the equipment, as declared by the manufacturer.

4.3 Mechanical and electrical design

4.3.1 General

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

4.3.2 Controls

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

4.3.3 PTT and voice- activated switch

Switching between the transmit and receive mode of operation shall only be possible by means of a non-locking PTT switch or by means of a non-locking voice-activated switch. If a voice-activated switch is used it shall not respond to ambient acoustic noise.

For SSB CB equipment with a microphone jack, the threshold level adjustment shall be accessible to the user. For DSB/angle modulated and/or CB equipment with a microphone jack, the threshold level adjustment may be accessible to the user.

All adjustments accessible by the user that have influence on the threshold shall be safe against unintended change of setting.

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4.3.4 Combination with other equipment

The equipment shall not be combined with any other form of transmitting or receiving equipment, which can produce unwanted modulation of the transmitter. The equipment shall not be provided with any terminals or other connection points, internal or external, for modulating sources other than those required for either a separate or a built-in microphone, or for selective calling or data transmission devices.

Terminals or other connecting points are permitted for the connection of external devices that shall not modulate the transmitters (e.g. a voice synthesizer device to give an aural indication of channel).

4.4 Declaration of conformity

The declaration of conformity should include the information about the applicable national regulation under which the equipment can be operated if the provider uses the present document for other carrier frequencies than PR 27 (see table 1).

5 Test conditions, power sources and ambient temperatures

5.1 Normal and extreme test conditions

Testing shall be performed under normal test conditions, and also, where stated, under extreme test conditions.

The test conditions and procedures shall be as specified in clauses 5.2 to 5.5.