

Limits and methods of measurement of radio disturbance characteristics of broadcast receivers and associated equipment

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55013:1997**

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National foreword

This British Standard has been prepared by Technical Committee GEL/210/5 (formerly GEL/110) and is the English language version of EN 55013:1990 *Limits and methods of measurement of radio disturbance characteristics of broadcast receivers and associated equipment*, including amendments A12:1994, A13:1996, corrigendum December 1997 and amendment A14:1999, published by the European Committee for Electrotechnical Standardization (CENELEC). EN 55013 is related to CISPR Publication 13:1975 including Amendment No. 1 [1983] *Limits and methods of measurement of radio interference characteristics of sound and television receivers*. It supersedes BS 905-1:1985 which is withdrawn.

NOTE There is no CENELEC amendment A11 to EN 55013:1990.

The “physiological” correction referred to in subclause 5.2.3.3 is commonly known as “loudness” correction.

Cross-references

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, the EN title page, pages 2 to 26, an inside back cover and a back cover.

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English version

Limits and methods of measurement of radio disturbance characteristics of broadcast receivers and associated equipment

(includes amendments A12:1994, A13:1996 and A14:1999)
(CISPR 13:1975/Amdt 1:1983, modified)

Limites et méthodes de mesure des caractéristiques de perturbations électromagnétiques des récepteurs de radiodiffusion et des appareils associés (inclut les amendements A12:1994, A13:1996 et A14:1999)
(CISPR 13:1975/Amdt 1:1983, modifiée)

Grenzwerte und Meßmethoden für die Funkstöreigenschaften von Rundfunkempfängern und angeschlossenen Geräten (enthält Änderungen A12:1994, A13:1996 und A14:1999)
(CISPR 13:1975/Amdt 1:1983, modifiziert)

This European Standard was approved by CENELEC on 6 December 1988; amendment A12 was approved by CENELEC on 1993-12-08, amendment A13 on 1996-07-02 and A14 on 1998-08-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B-1050 Brussels

Foreword

This European Standard has been prepared by the Ad Hoc Working Group, installed during the CENELEC/CISPR meeting in November 1985.

The aim of this standard is to prevent receivers and associated equipment causing electromagnetic disturbance and to avoid trade barriers between the CENELEC countries by providing a common standard on limits and methods of measurement of electromagnetic disturbance characteristics of receivers and associated equipment.

This standard is based largely on the recommendations in CISPR 13 (1975) and Amendment No. 1 (1983) to CISPR 13 which are currently being updated.

A draft standard was circulated for vote within the CENELEC countries until September 1988. Thirteen National Committees voted in favour and two National Committees were against approval. All editorial comments which led to an improvement of this standard have been incorporated.

Following the general policy of CENELEC to stay in line with IEC/CISPR as much as possible the CENELEC Technical Committee recommends that where possible this European Standard should be adapted to the updated CISPR Publication as soon as this international standard becomes available.

EN 55013 has been prepared by CLC/CISPR. It is based on CISPR Publication 13 (1975) and Amendment No. 1 (1983) to CISPR 13 and contains common modifications. It was approved by CENELEC on 6 December 1988.

The following dates are applicable:

- latest date of announcement of the EN at national level (doa):1989-03-01
- latest date of publication of a new harmonized standard (dop):1989-09-01
- date of withdrawal of conflicting national standards (dow):1989-09-01

Reference documents:

EN 55011 (1998):
Industrial, scientific and medical (ISM) radio-frequency equipment — Radio disturbance characteristics — Limits and methods of measurement

EN 55022 (1987):
Limits and methods of measurement of radio interference characteristics of information technology equipment:

CISPR 16 (1987):
CISPR specification for radio interference measuring apparatus and measurement methods. IEC Publication 107-1 (1977) and Amendment No. 1 (1987):
Recommended methods of measurement on receivers for television broadcast transmissions, Part 1: General considerations. Electrical measurements other than those at audio-frequencies.

ETS 300 158 (1992) Satellite Earth Stations (SES) Television Receive Only (TVRO-FSS)

ETS 300 249 (1993) Satellite Earth Stations (SES) Television Receive-Only (TVRO-BSS)

Foreword of amendment A12

This amendment to the European Standard EN 55013:1990 has been prepared by CENELEC Sub-Committee SC 110A, EMC Products.

In October 1992, a draft amendment (prA11) concerning requirements for satellite broadcast receivers was submitted to the Unique Acceptance Procedure (UAP). This draft was approved by CENELEC as amendment A11 to EN 55013 on 1993-07-06.

In April 1993, at the request of CLC/SC 110A, the text of documents CISPR/E(C.O.) 60, 61 and 62 was submitted to UAP as prA12. This text was approved by CENELEC as amendment A12 to EN 55013 on 1993-12-08.

CLC/SC 110A has combined the text of the two amendments and adapted it to be read with EN 55013 as amendment A12.

The following dates were fixed:

- latest date of publication of an identical national standard (dop) 1995-03-01
- latest date of withdrawal of conflicting national standards (dow) 1998-12-31

NOTE Amendment numbers commencing A1 refer to the endorsement of CISPR amendments, while those commencing A11 originate in CENELEC.

Foreword of amendment A13

This amendment was prepared by SC 210A, EMC Products, of Technical Committee CENELEC TC 210, EMC.

The text of the draft was submitted to the Unique Acceptance Procedure and was approved by CENELEC as amendment A13 to EN 55013:1990 on 1996-07-02.

The following dates were fixed:

- latest date by which the amendment has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 1997-06-01
- latest date by which the national standards conflicting with the amendment have to be withdrawn (dow) 1999-06-01

Foreword of amendment A14

This amendment was prepared by SC 210A, EMC Products, of Technical Committee CENELEC TC 210, EMC.

The text of the draft was submitted to the formal vote and was approved by CENELEC as amendment A14 to EN 55013:1990 on 1998-08-01.

The following dates were fixed:

- latest date by which the amendment has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 1999-12-01
- latest date by which the national standards conflicting with the amendment have to be withdrawn (dow) 2001-08-01

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1 Scope

1.1 This standard specifies limits and methods of measurement of electromagnetic disturbance caused by sound broadcast receivers, television receivers and associated equipment.

1.2 The frequency range covered is 9 kHz to 18 GHz.

2 Definitions

For the purpose of this standard, the definitions contained in IEC Publication 50: International Electrotechnical Vocabulary (IEV), Chapter 161: Electromagnetic Compatibility, apply, extended with the following specific definitions:

2.1

Sound receivers are appliances intended for the reception of sound broadcast and similar services for terrestrial, cable and satellite transmissions.

It may also concern digital apparatus (with digital incoming signals) or apparatus with digital processing (of digital or analogue incoming signals).

NOTE For the purpose of this standard the VHF band II covers frequencies from 87.5 MHz to 108 MHz.

2.2

Television receivers are appliances intended for the reception of television broadcast and similar services for terrestrial, cable and satellite transmission.

It may also concern digital apparatus (with digital incoming signals) or apparatus with digital processing (of digital or analogue incoming signals).

NOTE 1 For the purpose of this standard the following frequency bands are defined:

Band I	from 47 MHz to 68 MHz
Band III	from 174 MHz to 230 MHz
Band IV	from 470 MHz to 598 MHz
Band V	from 598 MHz to 862 MHz
S-bands	U.C.
Hyperband	U.C.

In practice not all television receivers are tunable over these complete frequency ranges. On the other hand many television receivers are tunable over additional channels, exclusively used in cable distribution networks.

NOTE 2 Modular units which are part of sound or television receiving systems like tuners, frequency converters, modulators, etc. are considered to be sound or television receivers respectively.

Tuners may be provided with a broadcast-satellite-receiving stage and with demodulators, decoders, demultiplexers, D/A converters, encoders (e.g. PAL encoders) etc.

Frequency converters may be provided with a broadcast-satellite-receiving stage and with devices which convert the signals to other frequency bands.

Receivers, tuners or frequency converters may be tunable or may only be able to receive a fixed frequency.

2.3

Associated equipment is either intended to be connected directly to sound or television receivers, or to generate or reproduce audio or visual information (for example, audio amplifiers, active loudspeaker units, record players, compact disc players, magnetic recording and playback equipment, infrared devices, electronic organs).

Information technology equipment is excluded even if it is intended to be connected to a television broadcast receiver.

Connections via the mains plug, local area network or home network are not considered to be direct connections.

NOTE Information technology equipment is covered by EN 55 022.

2.4

Multifunction equipment has two or more functions which are provided in the same unit, for instance television reception, radio reception, digital clock, tape recording or disc player.

2.5

Outdoor unit of Direct To Home satellite receiving systems for individual reception (Type B of ETS 300 158:1992). See clause 3 of ETS 300 249:1993.

NOTE Satellite receiving systems for collective reception (Type A of ETS 300 158:1992) in particular:

- cable distribution head ends (Community Antenna Television, CATV)
- community reception systems (Master Antenna Television, MATV) are covered by EN 50083-2.

3 Limits of electromagnetic disturbance

3.1 General

The disturbance signal shall not exceed the limits specified in subclauses 3.2 to 3.5 when measured using the methods given in clause 5. At the transition frequencies, the lower limit applies. For equipment in volume production, it is required that, with 80 % confidence, at least 80% of production complies with the limits (see clause 6).

For receivers intended exclusively for use in motor vehicles (for example car radios), only the limits for FM car radios in Table 2 shall apply.

3.2 Limits of mains terminal disturbance voltage

Measurements shall be made in accordance with subclause 5.2.

If the measurements with the quasi-peak detector give values equal to or less than the limits for the measurement with the average detector, then the limit for the measurement with the average detector need not be carried out.

3.3 Limits of antenna terminal disturbance voltage

Measurements of the antenna terminal voltage shall be made in accordance with subclause 5.3. The limit values specified correspond to a nominal impedance of 75 Ω. The limit values for receivers with nominal impedance other than 75 Ω are calculated according to the following formula:

Limit in R Ω, dB(μV) = Limit in table,
dB(μV) + 10 log₁₀ R/75

3.4 Limits of disturbance radiation

Measurements of the radiation due to the local oscillator at its fundamental and harmonic frequencies and due to all other sources shall be made in accordance with subclause 5.4. Radiation of VCRs shall be measured while operating in the receiving mode.

NOTE Radiation limits of VCRs, operating in the playback mode using an RF modulated carrier, are under consideration.

Sound broadcast receiver cards and TV broadcast receiver cards to be inserted in PCs, so-called PC tuner cards shall fulfil the requirements of Table 3B.

In the case of PC tuner cards, separately marketed for incorporation in diverse host units (e.g. PCs), the card shall be tested in at least one appropriate representative host unit of the choice of the card manufacturer.

Measurements are carried out with the tuner card inserted in a personal computer, switched on and the antenna input connector terminated with a non-radiating dummy load.

Antenna terminal disturbance is measured according to 5.3.

3.5 Limits of disturbance power

Measurement of the disturbance power shall be made in accordance with subclause 5.5.

3.6 Wanted signal and disturbance voltage at the RF output terminals of equipment with incorporated RF video modulator

Measurements of the wanted signal and disturbance voltage at the RF output terminals of equipment with RF video modulator incorporated (for instance VCRs, decoders) shall be made in accordance with 5.6. If the nominal impedance of the RF output is different from 75 Ω the limit level shall be calculated with the formula given in 3.3.

Table 1 — Limits of mains terminal disturbance voltage

Equipment type	Frequency range (MHz)	Limits [dB (μV)]	
		Quasi-peak	Average
Television and sound receivers and associated equipment	0.009 to 0.15	u.c.	u.c.
	0.15 to 0.5	66 to 56 ^a	56 to 46 ^a
	0.5 to 5	56	46
	5 to 30	60	50
u.c. = under consideration			
^a Decreasing linearly with the logarithm of the frequency.			