SLOVENSKI STANDARD
SIST EN 61237-2:1999

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Broadcast video tape recorders - Methods of measurement -- Part 2: Electrical measurements of analogue composite video signals (IEC 61237-2:1995)

Broadcast video tape recorders - Methods of measurement -- Part 2: Electrical measurements of analogue composite video signals

Meßverfahren für Videobandgeräte für den Rundfunk -- Teil 2: Elektrische Messungen für analoge Composite-Videosignale

Magnétoscopes de radiodiffusion - Méthodes de mesure -- Partie 2: Mesures électriques pour les signaux vidéo analogiques composites

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Broadcast video tape recorders
Methods of measurement
Part 2: Electrical measurements of analogue composite video signals
(IEC 1237-2:1995)

Magnétoscopes de radiodiffusion
Méthodes de mesure
Partie 2: Mesures électriques pour les signaux vidéo analogiques composites
(CEI 1237-2:1995)

Videobandgeräte für den Rundfunk
Meßverfahren
Teil 2: Elektrische Messungen an Geräten für analoge magnetische Aufzeichnung von zusammengesetzten Videosignalen
(IEC 1237-2:1995)

This European Standard was approved by CENELEC on 1994-03-08. 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
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Foreword

The text of document 60B(CO)159 + 159A, future edition 1 of IEC 1237-2, prepared by SC 60B, Video recording, of IEC TC 60, Recording, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 61237-2 on 1994-03-08.

This European Standard supersedes HD 439 S1:1983.

The following dates were fixed:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 1996-05-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 1996-05-01

Annexes designated "normative" are part of the body of the standard.
Annexes designated "informative" are given for information only.
In this standard, annex ZA is normative and annexes A, B, C and D are informative.
Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 1237-2:1995 was approved by CENELEC as a European Standard without any modification.

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

NOTE: When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

Publication	Year	Title	EN/HD	Year
IEC 244-10	1986	Methods of measurement for radio transmitters Part 10: Methods of measurement for television transmitters and transposers employing insertion test signals	EN 60244-10	1993
IEC 756	1991	Non-broadcast video tape recorders Time base stability	EN 60756	1993
IEC 883	1987	Measuring method for chrominance signal-to-random noise ratio for video tape recorders	HD 527 S1	1989
IEC 1041-1	1990	Non-broadcast video tape recorders Methods of measurement Part 1: General video (NTSC/PAL) and audio (longitudinal) characteristics	EN 61041-1	1995
IEC 1041-2	1994	Part 2: Video characteristics chrominance SECAM	-	-
CCIR Recommendation 471-1	1990	Nomenclature and description of colour bar signals (Vol. XI-1)	-	-
CCIR Recommendation 567-3	1990	Transmission performance of television circuits designed for use in international connections (Vol. XII)	-	-

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

BROADCAST VIDEO TAPE RECORDERS – METHODS OF MEASUREMENT –

Part 2: Electrical measurements of analogue composite video signals

FOREWORD

1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the IEC is to promote international cooperation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, the IEC publishes International Standards. Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. The IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.

2) The formal decisions or agreements of the IEC on technical matters, prepared by technical committees on which all the National Committees having a special interest therein are represented, express, as nearly as possible, an international consensus of opinion on the subjects dealt with.

3) They have the form of recommendations for international use published in the form of standards, technical reports or guides and they are accepted by the National Committees in that sense.

4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.

International Standard IEC 1237-2 has been prepared by sub-committee 60B: Video recording, of IEC technical committee 60: Recording.

IEC 698: Measuring methods for television tape machine, has been withdrawn from the catalogue. However, this publication still applies, on the one hand, to materials specified in IEC 347: Transverse track video recorders (second edition) which are not included in the new draft and, on the other hand, to mechanical measurements on transverse track video recorders (only).

The text of this standard is based on the following documents:

DIS	Reports on voting
60B(CO)159 60B(CO)159A	60B(CO)171

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

IEC 1237 consists of the following parts, under the general title – Methods of measurement for broadcast video tape recorders:

Part 1: Mechanical measurements

Part 2: Electrical measurements of analogue composite video signals

Part 3: Electrical measurements of analogue component video signals

Part 4: Measurement of audio performance – analogue

Part 5: Electrical measurements of digital composite video signals and digital audio signals

Part 6: Electrical measurements of digital component video signals and digital audio signals

Annexes A, B, C and D are for information only.

BROADCAST VIDEO TAPE RECORDERS – METHODS OF MEASUREMENT –

Part 2: Electrical measurements of analogue composite video signals

1 Scope and object

This part of IEC 1237 describes the test signals and measuring methods for equipments mainly dedicated to record/playback analogue composite TV-signals on magnetic tape on reels or in cassettes.

The allowable tolerances for the rated values for acceptable performance are not given in this standard, but may be derived from the specifications for the related system, i.e. appropriate publications, manufacturers' specifications, etc.

The necessary reference and calibration tapes are either mentioned in the specific IEC publication of equipment under test or included in IEC 1105 (reference tapes) and IEC 1295 (calibration tapes).

The principal object of this standard is to describe the methods of measurement, test signals and procedures which may apply to characteristics of video recording/playback machines mainly intended for professional use. The measuring methods described hereafter do not directly concern home equipment and it would appear that some will be difficult to apply to them.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of IEC 1237. At the time of publication, the editions indicated were valid. All normative documents are subject to revision, and parties to agreements based on this part of IEC 1237 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 244-10: 1986, *Methods of measurement for radio transmitters – Part 10: Methods of measurements for television transmitters and transposers employing insertion test signals*

IEC 756: 1991, *Non-broadcast video tape recorders – Time base stability*

IEC 883: 1987, *Measuring method for chrominance signal-to-random noise ratio for video tape recorders*

IEC 1041-1: 1990, *Non-broadcast video tape recorders – Methods of measurement – Part 1: General video (NTSC/PAL) and audio (longitudinal) characteristics*

IEC 1041-2: 1994, *Non-broadcast video tape recorders – Methods of measurements – Part 2: Video characteristics chrominance*

CCIR Recommendation 471-1: 1990, *Nomenclature and description of colour bar signals (Vol. XI-1)*

CCIR Recommendation 567-3: 1990, *Transmission performance of television circuits designed for use in international connections (Vol. XII)*

3 General

This standard deals with the application of measuring methods designed for general use television production and transmission as well as special measurement techniques for television tape machines.

The methods are applicable to acceptance tests, performance comparisons and, as far as possible, to routine checks. To insure that the results obtained at a specific time at a specific place are comparable to other measurements it is advisable to specify the test signals, measuring devices and types of tapes used together with the results obtained.

Since measurements of television tape machines on the basis of a single test-line per field may not be fully representative of the full-field performance (see 5.2 and 5.3), they may give results which differ from those obtained or calculated with full-field test signals. Therefore it is necessary to additionally specify the measuring method i.e.

- single line measurement (line number);
- block measurement (start-line, step-by-step line(s), number of steps);
- full-field measurement.

Additionally it should be stated if the selection of lines coincides with a single record/playback head only.

4 Test conditions

If not otherwise stated all measurements shall be carried out at the following atmospheric conditions.

Temperature	(20 ± 1) °C
Relative humidity	(50 ± 2) %
Air pressure	86 kPa to 106 kPa
Conditioning before testing	24 h

5 Measuring methods and test signals

5.1 *Manual and automatic measurements*

If an automatic measuring device is designed to give reliable results under the special conditions of television tape recording/playback as e.g. drop-out, jitter, time-base errors, head switching or partly insufficient head-to-tape contact, a significant improvement in measuring speed, accuracy and comparability of results can be achieved.

Therefore preference was given to measuring methods which can be carried out by automatic measuring equipment or which are suitable for automatic measuring techniques.

Except where a distinction is made in particular clauses between manual and automatic methods of measurement, the measurement procedures given in this standard are valid for both methods. However, although in the case of automatic measurements the procedure is carried out automatically by the test signal analyzer, the various steps are described as if they were performed manually.

5.2 *Measurement of differences between adjacent tracks (fields/segments)*

All currently standardized recording formats make use of segmented recording techniques. The length of the segments (tracks) varies between approximately 16 lines and one field where the latter is often termed "non segmented recording" which only indicates that there is no cut within the field.

Since two or more heads are used for record and playback of the video information to and from the tracks it is desirable to restrict the measurement to segments related to a specific head. This requires a special signal arrangement which provides identical information to the heads or segments in turn.

A suitable arrangement for most formats is to repeat a packet of up to 16 different signals of a duration of one line within a field and to make the signals identical in both fields.

5.3 *Procedure of measurement*

The measurements shall be carried out by measuring the playback signal after recording on the same equipment (best-case configuration).

In certain particular cases, if the multigeneration-performance of a video recording system is measured, the measurements shall be carried out by measuring the playback signal after recording on a different machine (worst-case configuration).

If the television tape machine under test is equipped with external controls, e.g. tracking control, gain control, etc. these controls shall be set to their preset or mid-position for all measurements.

5.4 *Test signals*

5.4.1 *Introduction*

A representative range of test signals is shown in annexes B and C (figures B.1 to B.6 and C.1 to C.7). For ease of reference they are indicated by roman numerals. The test signals elements are defined in annex A.

The terms concerning the components and values of a composite colour video signal are given after figure A.3.

5.4.2 *Amplitudes and characteristics of test signals*

The peak-to-peak amplitude of a monochrome composite video signal, e.g. from sync tip to white level, shall be

$$1{,}0\ V_{p\text{-}p}$$

The nominal value of the luminance component and the amplitude of the synchronizing pulses differs between the television systems as shown in table 1.

The nominal value of the luminance component is regarded as 100 %.

Table 1 – Nominal signal amplitudes for 625-line and 525-line standard

	625-line standards	525-line standards
Luminance (Y)	700 mV = 100 %	714 mV = 100 % IRE
Sync	–300 mV	–286 mV

All other test signal amplitudes may be expressed as a percentage of the nominal value of the luminance component.

Unless otherwise stated the characteristics of the synchronising signal and the characteristics of the chrominance signal shall be in accordance with the CCIR television standard relevant to the television tape equipment under test.

5.4.3 *Test signal arrangement*

For manual or automatic measurement under identical conditions, the active field period shall contain a specific picture test signal for measurement of the video characteristics.

However, particularly in case of automatic measurements, a signal arrangement as mentioned in 5.2 may be used. This supports simultaneous measurements of different parameters and renders reliable results by averaging values obtained from the specific picture test signal of successive packets within a field. Unless otherwise stated the specific picture test signal shall be identical in each horizontal line of the active field period, e.g. regarding amplitude, frequency, phase, timing, etc.