

Methods of measurement

Non-broadcast video tape recorders —

**Part 5: High-band video tape recorders,
including those equipped with Y/C
video connectors (NTSC/PAL)**

The European Standard EN 61041-5:1997 has the status of a
British Standard

ICS 33.160.40

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National foreword

This British Standard is the English language version of EN 61041-5:1997. It is identical with IEC 61041-5:1997.

The UK participation in its preparation was entrusted by Technical Committee EPL/100, Audio, video and multimedia systems and equipment, to Subcommittee EPL/100/2, Recording, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

A list of organizations represented on this committee can be obtained on request to its secretary.

For ease of reference to other parts of BS 7434, this standard has also been designated as BS 7434-5.

IEC 61041 consists of the following parts:

- *Part 1: General video (NTSC/PAL) and audio (longitudinal) characteristics;*
- *Part 2: Video characteristics chrominance SECAM;*
- *Part 3: Audio characteristics for FM recording;*
- *Part 4: Calibration tape (NTSC/PAL/SECAM);*
- *Part 5: High-band video tape recorders, including those equipped with Y/C video connectors (NTSC/PAL).*

Cross-references

Attention is drawn to the fact that CEN and CENELEC standards normally include an annex which lists normative references to international publications with their corresponding European publications. The British Standards which implement international or European publications referred to in this document may be found in the BSI Standards Catalogue under the section entitled “International Standards Correspondence Index”, or by using the “Find” facility of the BSI Standards Electronic Catalogue.

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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 30, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

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Descriptors: Recording apparatus, video recording, sound recording, magnetoscopes, measurements, characteristics, chrominance, luminance, video signals

English version

Non-broadcast video tape recorders — Methods of measurement Part 5: High-band video tape recorders, including those equipped with Y/C video connectors (NTSC/PAL)

(IEC 61041-5:1997)

Magnétoscopes hors radiodiffusion
Méthodes de mesure
Partie 5: Magnétoscopes en bande élargie, y compris ceux équipés de connecteurs Y/C (NTSC/PAL)
(CEI 61041-5:1997)

Videobandgeräte für den Gebrauch außerhalb des Rundfunks
Meßverfahren
Teil 5: Hi-Band-Videobandgeräte, einschließlich solcher, die mit Y/C-Video-Steckverbindungen ausgerüstet sind (NTSC/PAL)
(IEC 61041-5:1997)

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European Committee for Electrotechnical Standardization
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Foreword

The text of document 100B/45/FDIS, future edition 1 of IEC 61041-5, prepared by SC 60B (transformed into SC 100B, Recording, of IEC TC 100, Audio, video and multimedia systems and equipment), was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 61041-5 on 1997-07-01.

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) 1998-04-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 1998-04-01

Annexes designated “normative” are part of the body of the standard.

In this standard, Annex ZA is normative.

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 61041-5:1997 was approved by CENELEC as a European Standard without any modification.

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Introduction

This part of IEC 61041 has been prepared for the reasons given below.

Part 1 of IEC 61041 applies to non-broadcast video tape recorders which record the video signal within the video bandpass frequencies of home-use TV receivers. This part of IEC 61041, however, applies to other types of non-broadcast video tape recorders (hereinafter referred to as high-band video tape recorders) which record the video signal with greater than the normal video bandpass frequencies, for high resolution video recording.

This part of IEC 61041 is to be referred to particularly when characteristics of the video and audio signals recorded and reproduced using high-band video tape recorders are to be checked and measured.

Section 1. General requirements

1.1 Scope and object

This part of IEC 61041 specifies the general requirements for methods of measurement for high-band video tape recorders, including those equipped with Y/C video connector(s) (NTSC/PAL).

This part of IEC 61041 is applicable both to machines using normal input/output connectors for the measurement of the composite video signal, and to machines using the Y/C video connector(s) (herein after referred to as S video connectors) for the measurement of the Y/C separated video signal.

This part of IEC 61041 is applicable when characteristics of the video and audio signals recorded and reproduced using high-band video tape recorders are to be checked and measured.

The object of this part is to describe the methods of measurement for non-broadcast video tape recorders.

1.2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of IEC 61041. 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 61041 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 60094-2:1994, *Magnetic tape sound recording and reproducing systems — Part 2: Calibration tapes*.

IEC 60094-3:1979, *Magnetic tape sound recording and reproducing systems — Part 3: Methods of measuring the characteristics of recording and reproducing equipment for sound on magnetic tape*.

IEC 60735:1991, *Measuring methods for video tape properties*.

IEC 61105:1991, *Reference tapes for video tape recorder systems*.

ITU-R Recommendation 471-1:1990, *Nomenclature and description of colour bar signals (Vol. X1-1)*.

EIA RS-189A:1976, *Encoded colour bar signal*.

1.3 Conditions of measurement

1.3.1 Environmental conditions and preparation of the tape

For the environmental conditions for measurement and also for the preparation required for the video test tape, see the following subclauses.

1.3.1.1 Ambient temperature and relative humidity

Carry out measurement under ambient temperature within a range of $20\text{ °C} \pm 2\text{ °C}$ and relative humidity within a range of $(50 \pm 2)\%$. Ambient temperature may be within a range 5 °C and 35 °C , and relative humidity may be within a range 45% and 75% if these tolerances do not affect the results of measurement. Record the temperature and the humidity at the time of measurement with the results of measurement.

1.3.1.2 Preparation for the video test tape

Leave the video test tape for 24 h or more in the same conditions as the environmental conditions of measurement so that the measurement can be carried out accurately under steady conditions.

1.3.2 Power supply

Regarding the specifications of the power supply and warm-up time for the video tape recorder to be measured, see the following subclauses.

1.3.2.1 *For a video tape recorder which is operated from an a.c. power supply only*

Use the a.c. power supply which conforms to the power requirements for the video tape recorder under test. Voltage regulation shall be $\pm 2,5\%$ or less. Frequency deviation shall be $\pm 0,5\%$ or less.

1.3.2.2 *For a video tape recorder which is operated from a d.c. power supply only (including battery-operated video tape recorders)*

Use the d.c. power supply which conforms to the voltage requirements for the video tape recorder under test. Voltage regulation shall be $\pm 2,5\%$ or less.

1.3.2.3 *For a video tape recorder which can be operated from either an a.c. or d.c. power supply*

Use the a.c. power supply. However, if there is doubt about the results of any measurement obtained using only the a.c. power supply, repeat using the d.c. power supply.

1.3.2.4 *Warm-up time*

The video tape recorder to be tested should be switched to the standby mode for 3 h before starting measurements. This time is required for video tape recorders equipped with a heater on the cylinder of the head drum assembly.

1.3.3 Video test tape

Use the video test tape which conforms to the video tape specifications of the video tape recorder under test. Record the type of the tape and the name of the manufacturer of the tape with the results of measurement.

1.3.4 Test signals

Use the test signals specified below for measurement.

1.3.4.1 *The video signal*

Use a video signal which has a 100 % amplitude level white signal of 4 μ s inserted in every horizontal period so that the results of measurement do not include errors caused by disturbance of the video AGC circuitry of the video tape recorder under test. A video signal which contains the 100 % level white signal over eight horizontal video periods inserted in every vertical blanking period may be used as an alternative.

1.3.4.2 *The colour bar signal*

Use the standard colour bar signal which conforms to ITU-R Recommendation 471-1, type (b).

1.3.5 Conditions of recording

Carry out measurement of the video tape recorder under the following video and audio recording conditions. Check first that conditions are normal, and then start the measurement.

1.3.5.1 *Conditions of video recording*

Choose the video test signal specified for each item of measurement, and apply it to the video input connector of the video tape recorder under test. The level at the input connector shall conform to the video input level specified by the manufacturer of the video tape recorder so that recording can be made at the specified recording level.

1.3.5.2 *Conditions of audio recording*

Apply a 400 Hz or 1 kHz audio test signal specified in the format of the video tape recorder under test at the level specified by the manufacturer at the same time when video recording is made.

1.3.6 Statement of video tape speed for measurement

If the video tape recorder under test can operate at more than one tape speed, the tape speed used for the test shall be stated.

1.4 Definitions

For the purpose of this part of IEC 61041, the following definitions apply.

1.4.1

high-band video tape recorders

non-broadcast video tape recorders which record a video signal of wider band width than that used by home-use TV receivers (4,5 MHz for NTSC system and 5,5 MHz for PAL system) for the purpose of high resolution video recording

1.4.2

S video connector (Y/C video connector)

input or output connectors used for the reception or transmission of the luminance signal and the chrominance signal, these being separated from each other (not as a composite video signal). The luminance video signal input to, or output from, the S connector is referred to as the S luminance signal. The chrominance video signal input to, or output from, the S video connector is referred to as the S chrominance signal. The letter “S” in S video signal is derived from the initial letter of the word separate

1.4.3

diagonal resolution

measurement made in the diagonal direction on the picture screen. It can be obtained from the frequency response characteristics of the luminance signal

1.4.4

frequency characteristic for diagonal resolution

the frequency characteristic of the luminance signal in the diagonal direction of a picture screen is the ratio of the record/playback level with respect to the reference level of the video signal. The frequency characteristic is measured in the same way as for that of the horizontal direction (see clause 2.2). The frequency characteristic around the chrominance signal frequencies is important for determining the separation of the chrominance signal from the luminance signal; therefore, these methods apply to measurement of the signal around those frequencies

1.4.5

waveform distortion in vertical direction of a picture screen

picture distortion in vertical direction of a picture screen caused by horizontal (line) correlation process with a comb filter. It is measured as waveform distortion of luminance signal

1.4.6

colour flicker

flicker resulting from amplitude and phase variations of the chrominance signal from field to field

1.4.7

colour change points

transition points where the hue and/or level of the chrominance signal changes in the horizontal direction of a picture screen

1.4.8

colour displacement in vertical direction

time delay of the chrominance signal with respect to the luminance signal. It is measured as the number of horizontal lines

1.4.9

colour distortion in vertical direction

rise and fall time periods of the chrominance signal in the vertical direction. It is measured as the number of horizontal lines

1.4.10

Y signal

abbreviated expression for luminance signal