

Methods for

Measuring television tape machine parameters —

(Implementation of
CENELEC HD 439 S1)

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This British Standard, having been prepared under the direction of the Electronic Equipment Standards Committee, was published under the authority of the Board BSI and comes into effect on 30 November 1982

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Contents

	Page
Cooperating organizations	Inside front cover
National foreword	ii
1 Scope	1
2 Diameter of the headwheel (or drum)	1
3 Projection of video head pole tips	1
4 Radius of curvature of the vacuum guide	1
5 Longitudinal pitch of the video tracks	2
6 Position of recorded vertical synchronization signal	2
7 Coplanarity error of video heads	3
8 Video track curvature	3
9 Location of control track record along the tape	3
10 Jitter of reproduced picture	4
11 Velocity errors: applicable to PAL and NTSC	4
12 Video signal-to-noise ratio	4
13 Differential gain	4
14 Differential phase	4
15 Moiré	5
16 Measuring methods applicable to other subjects	5
Figure 1 — Method of measurement of the radius of curvature of the vacuum guide	6
Figure 2 — Method of measurement of video-track curvature for helical-scan recorders	7
Publications referred to	Inside back cover

National foreword

This British Standard has been published under the direction of the Electronic Equipment Standards Policy Committee and is identical with IEC 698:1981 “*Measuring methods for television tape machines*”, published by the International Electrotechnical Commission (IEC). This standard is also in agreement with Harmonization Document HD 439 S1, published by the European Committee for Electrotechnical Standardization (CENELEC).

Cross-reference

International Standard	Corresponding British Standard
IEC 347:1982	BS 4967:1983 <i>Specification for transverse track video tape recorders</i> (Identical)

Copies of CCIR documents may be purchased from BSI Sales Dept., Linford Wood, Milton Keynes, MK14 6LE.

The reference to European Broadcasting Union (EBU) documents after clause 16 is for information only. Copies of EBU documents may be purchased from Technical Centre of the European Broadcasting Union, Avenue Albert Lancaster 32, B-1180 Bruxelles (Belgium).

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 8, 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.

1 Scope

This standard describes the measuring methods which may apply specifically to characteristics of television tape machines or to recorded tapes in order to define accurately their specifications.

This standard is not immediately concerned with home equipment, and it would appear that some measuring methods will be difficult to apply to them.

2 Diameter of the headwheel (or drum)

2.1 Transverse track recorders

The measurement is usually only possible prior to assembling of the head and is therefore made by the manufacturer and the value is supplied to the user.

The measurement is made by means of a precision micrometer and shall be made across a diameter at approximately 20° from the trailing edge of the pole tips.

2.2 Helical-scan recorders

The drum diameter is measured by means of a precision micrometer. Measurements shall be made at several points on the drum, and these points shall be specified by the manufacturer.

3 Projection of video head pole tips

3.1 Transverse track recorders

Tip projection is measured by means of a precision dial indicator. A point on the rim of the headwheel at approximately 20° from the trailing edge of the pole tip is measured as reference and then the pole tip is measured. The difference between the two readings is the tip projection.

If the plane defined by the pole tips is displaced relatively to the headwheel plane, the design of the mounting shall be such that the measuring direction is perpendicular to the axis of rotation of the headwheel provided the user mounts the dial indicator with sufficient care.

The diameter of the headwheel may deviate from its nominal value because of manufacturing tolerances, and wear; therefore, the value of tip projection obtained above shall be corrected to allow for deviations of the headwheel diameter from its nominal value. Since it is not usually possible to measure the headwheel diameter on an assembled head, the corrected value is dependent upon data supplied by the manufacturer.

3.2 Helical-scan recorders

Measurements are also made by means of a dial indicator. Usually either the upper or lower drum serves as reference, depending on the specifications of the manufacturer. The measuring device is specified and often supplied by the manufacturer.

4 Radius of curvature of the vacuum guide

a) Reference used for measurements

The basic reference used in the measurement of the radius of the vacuum guide is a master template. Such a template is made by fabricating a ring to a very precise inner diameter tolerance, and measuring the ring on a roundness metering apparatus to a specified accuracy of $\pm 0.13 \mu\text{m}$ ($\pm 5 \mu\text{in}$). The calibrated ring is then split across a diameter and two reference masters thus obtained. These reference masters are inspected to ascertain that no distortion has occurred during the splitting process.

b) Vacuum guide measuring fixture

The fixture consists of a solid-steel base with a precision spindle holding a dial indicator calibrated in divisions of $0.5 \mu\text{m}$ ($20 \mu\text{in}$). A radius reference master is permanently affixed. Two micrometer adjustment mechanisms are used to position the guides to be measured to be concentric with the radius of the reference master and a set of gauge blocks is used to adjust the vertical position of the spindle to measure the two "lands" of the vacuum guide. The inherent accuracy of the spindle has been measured to be within the range of $0.5 \mu\text{m}$ ($20 \mu\text{in}$) total error.

c) Method of measurement (see Figure 1, page 6)

1. The dial indicator is zeroed against the radius of the reference master.
2. A master guide is placed into the fixture and its radius measured to verify the measurement system. This may be done daily or at other time intervals as is required.
3. The vacuum guide to be measured is placed into position on the fixture and centred with the micrometer mechanisms until it is concentric to the reference master. By observation of the difference in dial indicator reading between the guide radius and the reference radius an absolute radius dimension is obtained. This is repeated for both "lands".
4. The perpendicularity of the cylindrical surface to the guide reference mounting surface is also checked by sliding the spindle vertically and observing the difference in readings between the "lands".