
**Cinematography — Audio head tones for
use in international exchange of 35 mm
analogue magnetic film masters —
Specifications and location**

*Cinématographie — «Audio head tones» pour utilisation dans les
échanges internationaux de «masters» de film magnétique analogiques
de 35 mm — Spécifications et emplacement*

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Foreword

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International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 12611 was prepared by Technical Committee ISO/TC 36, *Cinematography*.

This second edition cancels and replaces the first edition (ISO 12611:1997), of which it constitutes a minor revision.

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1 Scope

This International Standard specifies head-leader tones for use on interchanged motion-picture analogue audio masters, from two track (on three-track format records) through six track.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 266:1997, *Acoustics — Preferred frequencies*

ISO 4834:1997, *Cinematography — Magnetic sound test films excluding striped release prints — Basic technical characteristics*

AES7-2000, *AES standard for the preservation and restoration of audio recording — Method of measuring recorded fluxivity of magnetic sound records at medium wavelengths*¹⁾

DIN 45520:1973, *Magnetic tape recorders; measurement of the absolute level of the magnetic flux and its frequency response on magnetic tapes*

3 Leader

3.1 The first test section of leader shall be a 1 kHz sine wave signal recorded at a flux of 185 nWb/m as measured according to AES7. The tone shall be recorded simultaneously and in phase on all channels of the master, for a duration of 10 s for two-channel masters on three-track format records, 20 s for three- and four-track masters, and 30 s for six-track masters.

NOTE The reference level of 185 nWb/m does not preclude the use of calibration films made according to DIN 45520 from being used for the alignment of recorders and reproducers.

3.2 For two-channel masters recorded on the three-track format only, the second section of leader shall identify the channels audibly by sequencing, in time, one beep on the left channel and two beeps on the right channel.

1) Revision of AES7-1982. Published by Audio Engineering Society, Inc.

3.3 The third section of leader shall be pink-noise recorded simultaneously and in phase on all the channels of the master for a duration of 30 s. The recorded level shall be such as to prevent saturation effects, such as – 10 dB at a reference level of 185 nWb/m. The level in each one-third octave band from 40 Hz to 16 kHz shall be the same, within the limits given in ISO 266.

NOTE The objective of using a pink-noise test signal for this section is to have a reference signal with equal energy in equal logarithmic frequency intervals within the audio bandwidth.

3.4 If companding noise reduction systems are in use, the fourth section of leader shall be the test signal generated by the noise reduction system for its reference level, for a duration of 10 s for two-channel masters on three-track format, 20 s for three- and four-track masters, and 30 s for six-track masters.

NOTE Such signals generally have audible identifying characteristics to identify the type of noise reduction.

3.5 Head-leader tones shall be recorded on each roll of audio masters, and written information on track location shall be printed on the outside of each container.

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Annex A (informative)

Use of the test signals

A.1 Purpose

The purpose of this annex is to describe the usage of test signals which are specified in this International Standard, as well as practical limitations to their usage.

A.2 Uses of the reference level tone

Subclauses A.2.1 and A.2.2 detail adjustments which are interactive and which may have to be performed more than once to optimize the various adjustments.

A.2.1 The reference level tone may be used for setting the preliminary head-mounting adjustments such as coarse rotation, azimuth, zenith and height by setting the appropriate mechanical adjustments for the highest and most level-stable output.

A.2.2 An *X-Y* display of the reference tone on an oscilloscope may be used for coarse azimuth setting using the following method.

Connect the *X* and *Y* inputs of an oscilloscope to the signals from the preamplifier outputs of the two channels corresponding to the two tracks in use which are physically most widely separated on the format being used. With the sensitivity of the preamplifier channels set to play the reference tone at the oscilloscope connection point at equal voltages, and the sensitivity of the *X* and *Y* oscilloscope channels made equal, adjust the azimuth for a 45° diagonal line on the oscilloscope, not an ellipse.

A.2.3 The reference level tone may also be used as a relative channel polarity test by using an *X-Y* display to check that each of the preamplifier outputs corresponding to the records, compared to a reference channel output, have the same slope, not the opposite slope, which would indicate a polarity reversal in the head or preamplifier wiring.

A.3 Uses of pink noise

A.3.1 The pink noise can be used to obtain the best overall azimuth by observing a Lissajous' pattern on an oscilloscope with the *X* and *Y* axes connected to the signals from the two channels: when the reproducer sensitivity and equalization have been set for equal performance in the channels, and the azimuth is correct, a line will be displayed at a 45° angle, not a fuzzy ellipse. Pink noise has an advantage over sine wave tones for azimuth adjustment, as it produces unambiguous results (i.e. cannot be misadjusted by one full cycle).

A.3.2 In addition, pink noise can be used with a constant-percentage-bandwidth spectrum analyser, such as a one-third-octave band analyser, to set equalization adjustments.

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