SMPTE 210M-2004
Revision of
SMPTE 210M-1999

SMPTE STANDARD

for Motion-Picture Film (16-mm) — Magnetic Audio Records — Two Records on 16-mm Magnetic Film

1 Scope

1.1 This standard specifies the lateral positions and width dimensions of two 3.81 mm (0.150 in) magnetic audio records and a control track on 16-mm single-perforated magnetic recording film.

1.2 This standard also specifies the reproducing velocity of the film travel.

2 Audio record

2.1 The lateral location and width of each magnetic audio record shall be as specified in figure 1 and table 1.

2.2 The recording shall be made so that the azimuth of each record is at an angle of 90°± 5' to the reference edge of the film.

2.3 With the direction of travel as shown in figure 1, the magnetic coating shall be on the surface toward the observer.

3 Reproducing speed

The recording shall be made so that the audio records will reproduce properly at 24 perforations per second (approximately 11 m [36 ft] per minute or 183 mm [7.2 in] per second), which is 24 frames per second.

4 Track usage

4.1 For recording single records, the center track position shall be used. However, for international exchange, interchangeability is facilitated by placing identical information on both tracks.

4.2 For recording stereo programs, the center track position shall be used for the left-hand channel.

4.3 For recording two languages, the center track shall be used for the primary language and the edge track position shall be used for the secondary language.

4.4 The control track shall be used for recording other information and for address systems in analog or digital form.

Approved
November 8, 2004

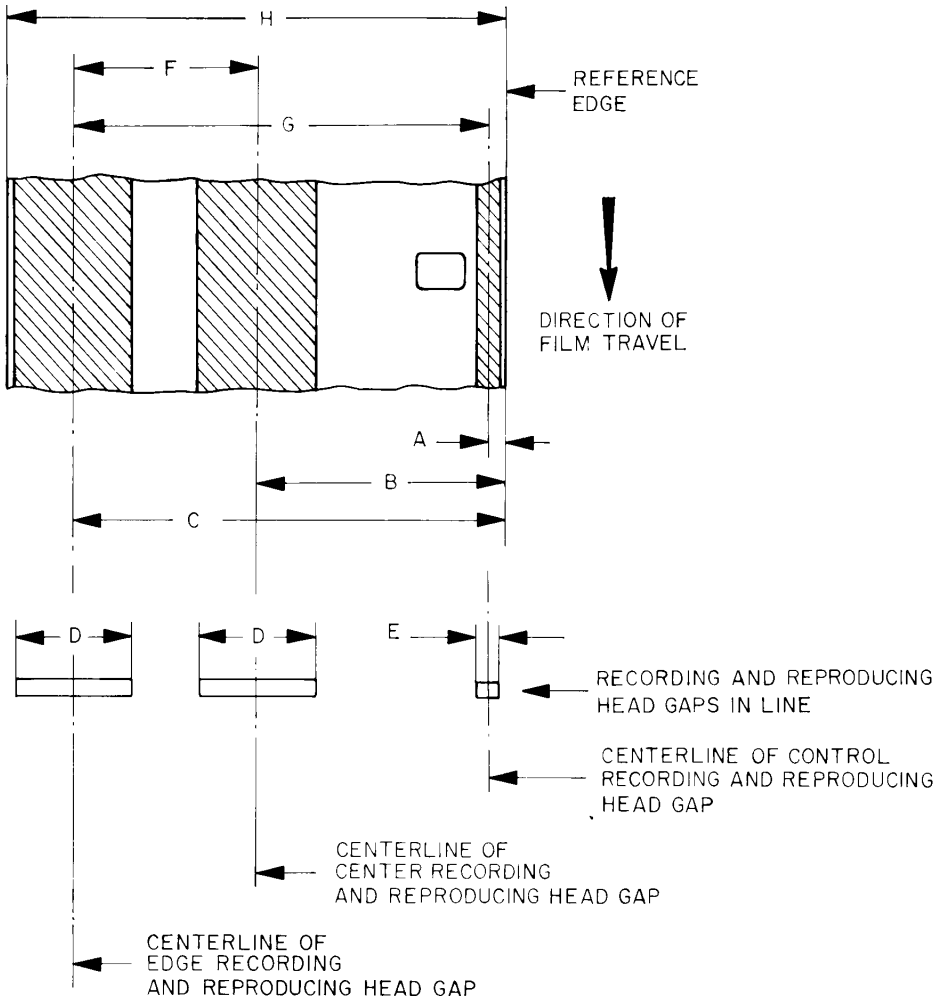

Figure 1 – Location of audio records

Table 1 – Specifications

Dimensions	Millimeters	Inches
A	0.46 ± 0.05	0.018 ± 0.002
B	7.95 ± 0.05	0.313 ± 0.002
C	13.89 ± 0.05	0.547 ± 0.002
D	3.81 + 0 – 0.10	0.150 + 0 – 0.004
E	0.71 + 0 – 0.10	0.028 + 0 – 0.004
F	5.95 nom	0.234 nom
G[1)]	13.45 nom	0.529 nom
H	15.95 ref	0.628 ref

[1)] Dimension G deviates from standard conversion procedures to reflect the practice in countries using the English system.

Annex A (informative)
Additional data

A.1 Record width

The width of the recorded area must be measured with great care, as it enters directly into the calculation of flux per unit track width.

When the recording head gap is narrower than the width of the coating or stripe, as is normal for all motion-picture test films, there is a measurement complication involving the uncertainties both in seeing the track and in determining the recording fringing.

If the recording head is available, the track width is best measured indirectly by measuring the gap width and adding to this dimension twice the thickness of the test record magnetic coating. This correction will usually be 0.0003 in to 0.0006 in (8 µm to 15 µm).

If the recording head is unavailable, the recorded record may be made visible by the use of a carbonyl iron suspension. Care should be taken to apply the minimum quantity that makes the recording visible, so that the developed image is not wider than the actual recorded area.

A.2 Reproducing head gap width

If precision measurements or calibrations are to be made on magnetic audio records made in accordance with this standard, reproducing head gaps of the same width dimension or wider than the recorded track must be used to prevent edge effects or fringing.

A.3 Erase heads

Erasing head gaps used to erase the records covered in this standard should be substantially wider than the records.

A.4 Picture-sound synchronization

The film is used for audio records only. Any accompanying picture is on a separate photographic film. When audio records are intended to be used in synchronization with pictorial material found on a separate film, the picture-sound relationship should be in accordance with SMPTE RP 25.

A.5 Magnetic coating

The dimensions of the magnetic coating are not specified, but it is assumed that the coating is wide enough to permit the placement of the audio records in accordance with this standard.

Annex B (informative)
Bibliography

SMPTE 109-2003, Motion-Picture Film (16-mm) – Perforated 1R and 2R

SMPTE RP 25-1995, Audio and Picture Synchronization on Motion-Picture Film Relative to the Universal Leader for Magnetic and Photographic Records