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>
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SMPTE STANDARD

SMPTE 112-2004
Revision of
SMPTE 112-1999

for Motion-Picture Film (16-mm) — 100-Mil Magnetic Audio Record

1 Scope

1.1 This standard specifies the position, dimensions, and reproducing speed of the nominal 100-mil (2.54-mm) magnetic audio record on 16-mm motion-picture film.

1.2 This standard also specifies the longitudinal picture-audio displacement on the film.

2 Audio record

2.1 The lateral location and width of the 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 the 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 is on the surface toward the observer.

3 Reproducing speed

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

4 Longitudinal picture-audio displacement

The magnetic audio record on the film shall precede the center of the corresponding picture by a distance of 28 frames ± ½ frame (see annex A.5).

Approved
November 8, 2004

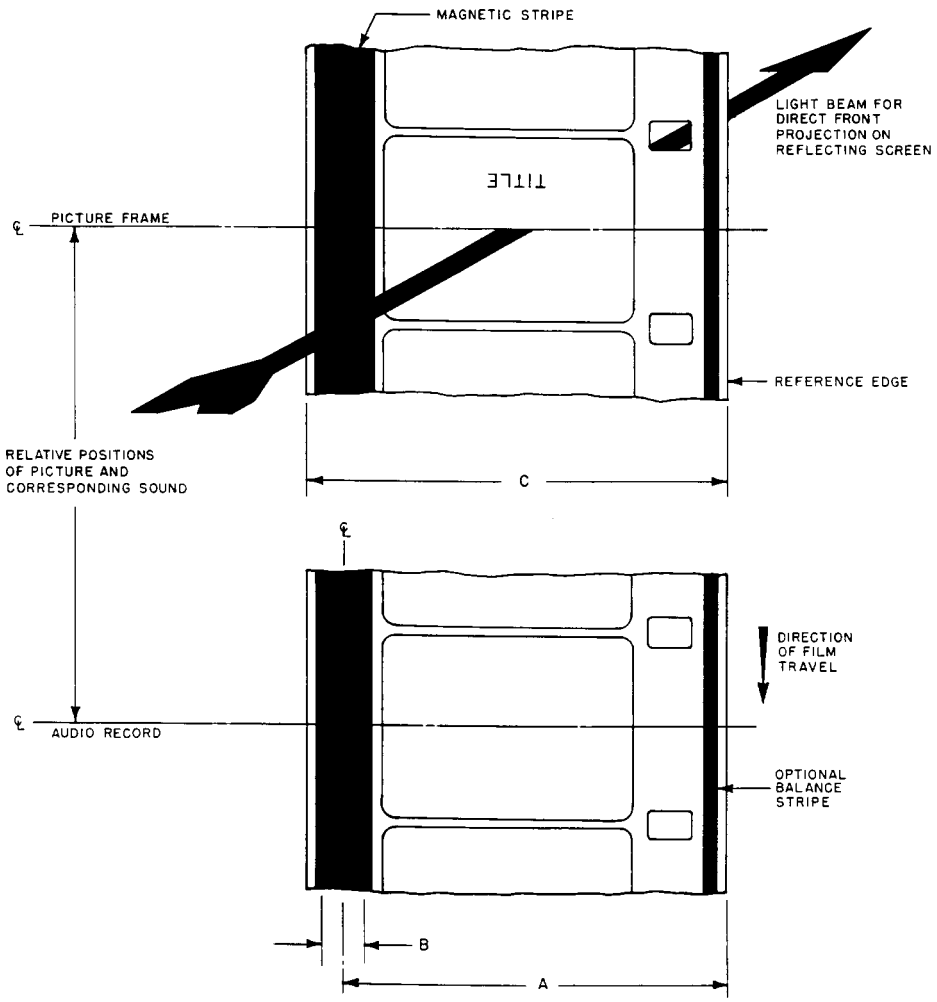

Figure 1 – Lateral location and width of magnetic audio record

Table 1 – Specifications

Dimensions	Inches	Millimeters
A	0.573 ± 0.002	14.55 ± 0.05
B	0.085 ± 0.004	2.16 ± 0.10
C	0.628 ref	15.95 ref

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 both the uncertainties 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 Recording head gap width

The recommended recording head gap width is 0.085 in ± 0.004 in (2.16 mm ± 0.10 mm). Combination record-reproduce heads should also have a gap width of 0.085 in (2.16 mm).

A.3 Reproducing the head gap width

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

A.4 Basic standards

Motion-picture prints conforming to this standard are usually made on film manufactured in accordance with SMPTE 109, magnetically striped in accordance with ANSI/SMPTE 87M, which specifies the minimum striping width as 0.095 in (2.41 mm), and projected in accordance with SMPTE 233.

A.5 Longitudinal picture-audio displacement

As a working procedure, the accuracy of picture-audio displacement in a projection print is frequently judged by screening in a review room. It is important that the standard thread-path in this review room projector be set accurately to the value specified in this standard minus 1 frame for every 50 ft (15 m) separating the loudspeaker from the observer. Otherwise, nonstandard prints may be produced.

A.6 Audio record position

The centerline, dimension A, of the magnetic record may be determined only by the measurement of the record position relative to the reference edge. This derived centerline is a very useful dimension assisting interchangeability among various recorders and reproducers.

Annex B (informative)
Bibliography

ANSI/SMPTE 87M-1996, Motion-Picture Film (16-mm) — 100-Mil Magnetic Striping

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

SMPTE 233-2003, Motion-Picture Film (16-mm) — Projectable Image Area and Projector Usage