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>
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>
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SMPTE STANDARD

SMPTE 41-2004
Revision of
SMPTE 41-1999

for Motion-Picture Film (16-mm) — Prints — Photographic Audio Records

1 Scope

1.1 This standard specifies the lateral location, dimensions, and the reproducing speed of variable-area and variable-density photographic audio records on 16-mm motion-picture prints.

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

1.3 The standard further specifies the width scanned in the audio reproducer.

2 Audio record

2.1 The dimensions and location of the audio records shall be as specified in figure 1 and table 1.

2.2 The recording and reproducing slit images shall be positioned at an angle of 90° ± 5' to the reference edge of the film.

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). This is equivalent to the projection speed of the picture film of 24 frames per second.

4 Longitudinal picture-audio displacement

The audio record on the film shall precede the center of the corresponding picture (frame 0) by a distance of 26 frames ± ½ frame in the direction of film travel during normal projection.

NOTES

1 Motion-picture prints conforming to this standard are usually projected in accordance with SMPTE 233.

2 Motion-picture prints conforming to this standard are usually made on film made in accordance with SMPTE 109.

3 Motion-picture prints described in this standard are printed in accordance with ANSI/SMPTE 48.

4 Where the original audio record has been reduction printed in some stage of the process, it may be impossible to obtain the black septum on either side of the recorded area. The presence of a clear septum between the audio and picture areas which does not encroach on the minimum tolerances of the printed area shall not be a basis for rejection of prints. Shaded septum areas are intended to include all unused areas on both sides of the audio record, up to the picture on one side and the film edge on the other. In no case shall the reduction printed area begin farther than 0.530 in (13.46 mm) nor extend less than 0.610 in (15.49 mm) from the reference edge of the film.

Approved
November 8, 2004

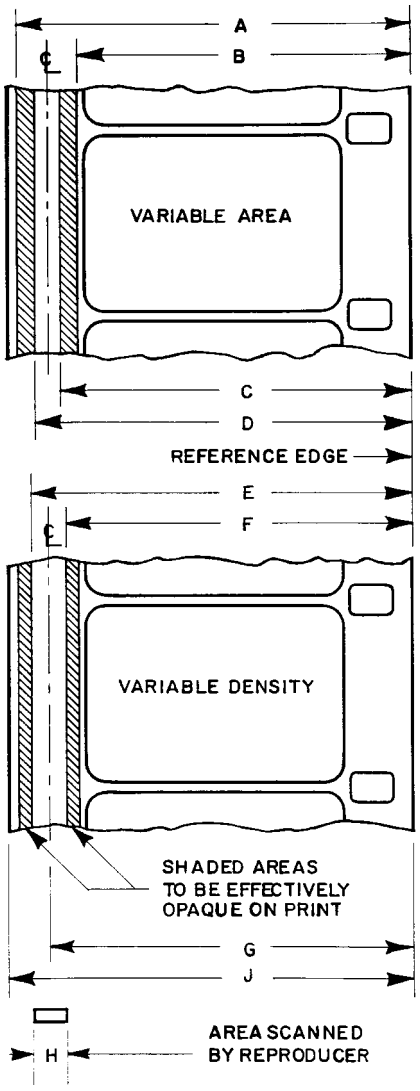

Figure 1 – Dimensions and location of the audio records

Table 1 – Specifications

Dimensions	Inches	Millimeters
A	0.611 min	5.52 min
B	0.513 ref	13.03 ref
C	0.540 ± 0.002	13.72 ± 0.05
D	0.600 ± 0.002	15.24 ± 0.05
E	0.610 ± 0.002	15.49 ± 0.05
F	0.530 ± 0.002	13.46 ± 0.05
G	0.570 ref	14.48 ref
H	0.071 ref	1.80 ref
J	0.628 ref	15.95 ref

Annex A (informative)
Additional data

A.1 As a working procedure, the accuracy of picture-audio displacement in a projection print is judged by screening in a review room. When the audio record is reproduced, the distance from the center of the projector aperture to the audio-scanning point should be adjusted to bring picture and audio into synchronism for the average observer. This distance should be shortened by one frame for approximately each 50 ft (15 m) of distance from loudspeaker to audience.

A.2 The dimensions in this standard are measured from the perforated edge which is the edge used in factory control of 16-mm width films. Guiding from the perforated edge is the prevalent practice in the manufacture of 16-mm projectors. Films printed in 32-mm width and subsequently slit to 16-mm width will be guided and positioned from factory-slit edges. Films printed on 35-mm width stock will either have one or no factory-made edge. The most common method would leave no factory-slit edge.

Annex B (informative)
Bibliography

ANSI/SMPTE 48-1995 (R2004), Motion-Picture Film (16-mm) — Picture and Sound Contact Printing — Printed Areas

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

SMPTE 233-2001, Motion-Picture Film (16-mm) — Projectable Image Area and Projector Usage