

further experiment of reperforming the Society's flutter test film and magnetic multifrequency film. Both of these were distributed for examination to the various interested manufacturers, all of whom have reported favorably upon this method of producing test film. This method allows the use of recorders presently being used in the production of 16mm magnetic test film for the production of 8mm test film, without modification, and thus speeds the time when the test film will become a standard SMPTE item.

The use of the magnetic multifrequency test film is covered by Proposed American Standard PH22.134, 8mm Magnetic Sound Reproduce Characteristic (*Journal*, Dec. 1961, p. 990). The tolerance limits given allow for a considerable pre-emphasis of the lower frequencies in the recording with a subsequent de-emphasis in the reproduction thus affording manufacturers an opportunity for improving their signal-to-noise ratio in commercial reproducing equipment without unduly affecting interchangeability of film between equipments. It is interesting to note that this standard proposal was drafted at the Detroit meeting and was unaffected by any of the subsequent actions and, hence, issues as a standard without conflict of opinions since its inception.

Summary

In final summation, the Society plans to stock all of the described test film as soon as it can be produced and plans eventually to calibrate primary standard 8mm magnetic multifrequency film by the methods currently utilized for the calibration of the 16mm magnetic test film, so that eventually an 8mm magnetic multifrequency test film of an exact 100- μ sec time-constant will be available. In the meantime it is proposed to calibrate the interim 8mm magnetic test films by comparing them to the 16mm magnetic test films by the reperformance process.

Acknowledgments

Only a brief survey of the Ad Hoc Committee's work has been presented here with reference to the cooperation and teamwork which have been characteristic of our Society over the years in meeting the needs of industry for its development and maintenance. I should like at this time, in my capacity as Chairman, to express my appreciation to those engineers who with their constructive and helpful assistance developed these standards and evaluated the test film. Commendations and appreciation are especially extended to John L. Forrest of Ansco; Robert Foley, Robert Herbst, George Krtous and John S. Powers of Bell & Howell Co.; Geo. W.

Colburn of Geo. W. Colburn Laboratory; J. M. Moriarty, and A. C. Robertson of Eastman Kodak; Hans Knafel of Fairchild Camera & Instrument Corp.; and Gary Kaess of Keystone Camera Co. A special word of appreciation should go to James L. Pettus, Chairman of the Sound Committee; and to Deane R. White, Engineering Vice-President. It should also be noted that without the encouragement and the assistance of Howard Schumacher and Alex Alden, successive SMPTE Staff Engineers, accomplishing these Standards would have been most difficult.

Discussion

Anon: Will the Society make available an 8mm sound print of typical program material for adjusting reproduction characteristics of projectors to compensate for various loudspeaker differences in the 8mm field?

Mr. D'Arcy: The 8mm magnetic sound reproduce characteristic discussed by Proposed American Standards PH22.122 to PH22.134 (*Journal*, Dec. 1961, p. 990) does not completely describe a reproduction system equalization, since the factors injected by choices of various loudspeakers and enclosures are not completely considered in its composition and the standard can therefore only be considered as a guide to the designer. A final step in system control would be for our Society to produce, and make available, representative program material for the 8mm field similar in content to that presently being used for the 35mm and 16mm final system adjustments. This comes under the heading of new business and is completely dependent upon establishment of the preceding standards, which I might suggest are the groundfloor requirements of sound film standardization.

standards and recommended practices

The Proposed SMPTE Recommended Practice and the Proposed American Standard printed here have been accepted by both the respective initiating committees and Standards Committee and are presented for a three-month period of trial. All comments should be sent to Alex E. Alden, Staff Engineer, prior to May 15, 1962. If no adverse comments are received, the Proposed Recommended Practice will then be submitted to the Society's Board of Governors for approval as an SMPTE Recommended Practice. The Proposed American Standard, however, will then be submitted to ASA Sectional Committee PH22 for further processing.

Proposed SMPTE Recommended Practice RP 12

This Proposed Recommended Practice, Minimum Screen Luminance for Drive-In Theaters, was developed by the SMPTE Screen Brightness Committee as one of a group of screen brightness standards and practices to help the theater managers and projectionists in establishing the proper viewing

conditions for their theater patrons. It must be pointed out that this Recommended Practice specifies the minimum luminance required under normal viewing conditions. This proposal should be a guide in establishing the proper relationship between the trend toward larger outdoor screens and the light output limitations of modern projection equipment.

Proposed American Standard PH22.137

The Proposed American Standard Four-Track Magnetic Sound for 35mm Release Prints has undergone some of the most severe deliberation in the Sound Committee of any of our standards. The proposal, initiated during 1953, finally reached the Standards Committee as the fourth draft in June of 1959. The controversial comments received during balloting returned the proposal back to the Sound Committee. Now in its seventh draft, the proposal has received approval of both the Sound and Standards committees.—A.E.A.

Minimum Screen Luminance for Drive-In Theaters

1. Scope

- 1.1 This recommended practice specifies the luminance (brightness) of the projection screens for drive-in theaters intended for the projection of 35mm motion-picture film at 24 frames/sec.
- 1.2 This recommended practice specifies screen luminance levels at which the tone scale, contrast, and pictorial quality of release prints of standard width and formats will be acceptably reproduced. It further defines luminance ratios assuring such quality throughout the audience area.
- 1.3 This recommended practice describes criteria for evaluating either perfectly diffusing or directional screens by establishing a minimum luminance level and maximum luminance variations.

2. Measurement

- 2.1 The measurement of screen luminance is made with the projector shutter running but with no film in the aperture.
- 2.2 Screen luminance shall be measured with a photometer having the spectral sensitivity of a standard observer as specified by the International Commission on Illumination in 1931. The acceptance angle of the photometer shall be as small as is practical, and shall be so used as to accept light from a screen area no larger than a circle whose diameter is 10 percent of the screen width.

3. Luminance Level

- 3.1 The minimum luminance at the center of the screen shall be 4.5 foot-lamberts (15.4 nits) as measured from a position on the longitudinal centerline of the ramp area and midway between the foremost and rearmost ramp.
- 3.2 The minimum luminance at any point on the horizontal centerline of the screen (excluding 5 percent of the screen width at each edge) shall be 2.5 foot-lamberts (8.6 nits) as measured from any ramp position.
- 3.3 The ratio between the luminance of the brightest and darkest points on the horizontal centerline of the screen (excluding 5 percent of the screen width at each edge), as seen from any car position, shall not be more than 3:1.
- 3.4 The maximum luminance level shall be the same as for indoor theaters complying with American Standard Screen Luminance for Indoor Theaters, PH22.124-1961.

4. Revision of American Standard Referred to in This Document

When the following American Standard referred to in this document is superseded by a revision approved by the American Standards Association, Incorporated, the revision shall apply:

American Standard Screen Luminance for Indoor Theaters, PH22.124-1961

APPENDIX

(This Appendix is not a part of Proposed SMPTE Recommended Practice RP12, Minimum Screen Luminance for Drive-In Theaters, but is included to facilitate its use.)

1. *Standard Luminance.* Acceptable luminance levels are limited by a minimum value below which the visual process becomes less efficient. Limits for maximum values must be established to avoid objectionable flicker but, in view of the presently achievable luminance in the drive-in, maximum limits have little value.
2. *Other Variables.* In addition to the luminance level and luminance distribution, the pictorial quality of projected pictures is influenced by the color of the projection light, the color and characteristics of the screen surface, the presence of stray light, the nature of the surround, screen surface uniformity, and other factors not presently described by standards.
3. *Screen Luminance.* The preferred screen luminance is the same level as for indoor theaters.

Preferred uniformity is obtained when:

1. The luminance of the center of the screen is constant from every ramp position in the theater;
2. The luminance at the sides of the screen, excluding the edges, is at least 60 percent of that at the center;
3. The luminance variation has axial symmetry around the center of the screen;
4. There is no abrupt change causing discontinuities in screen brightness between the various sections.

The values specified in 3.1 and 3.2 represent the minimum condition for an acceptable projected image where stray am-

bient light is negligible. The same prints are used for drive-in theaters as for indoor theaters and are therefore suitable for the higher luminance ranges that are found in indoor theaters. These minimum luminance levels are somewhat higher than in many existing drive-in theaters and may encourage operators to increase screen luminance. When new equipment provides higher luminance, it is expected that the screen luminance in more drive-in theaters will be above the minimum limits specified.

4. *Drive-In Theater Equipment.* This recommended practice is intended to apply only to drive-in theaters wherein screen sizes, viewing conditions and other factors dictate limitations not encountered with conventional indoor theaters. In view of excessively large screen area, projection throw distance, viewing distance, and ambient light conditions, it is necessary to achieve maximum efficiency in all elements to assure acceptable projection results. Use of high quality screens, proper adjustment of lamps, projector mechanism, and optical systems contribute importantly to the desired picture quality.

5. *Directional Screen.* Matte white screens will show substantially constant luminance at any one specific area on the screen for measurements from any location within the theater. Directional screens in current use have been designed to produce specific reflection patterns which, on goniometric measurements of luminance from various viewing angles, show wide departures from the properties of a perfectly diffusing surface. By suitable choice of such patterns, the attainable luminance may be increased considerably above that possible with a perfectly diffusing screen of the same size when measured near

Four-Track Magnetic Sound for 35mm Release Prints

PH22.137

1. Scope

- 1.1 This standard specifies the location and dimensions of the four magnetic sound stripes and of the record heads to be used thereon for 35mm motion-picture prints.
- 1.2 This standard specifies the distance between the sound and corresponding picture.

2. Film Base

With the direction of travel as shown in the diagram, the emulsion side of the film is up, the base is down, and the magnetic coating is on the base side.

3. Dimensions

- 3.1 The dimensions shall be as specified in the diagram and table.
- 3.2 The cutting and perforating dimensions are specified by American Standard Dimensions for 35mm Motion-Picture Film, CS-1870, PH22.102-1956.

4. Sound Records

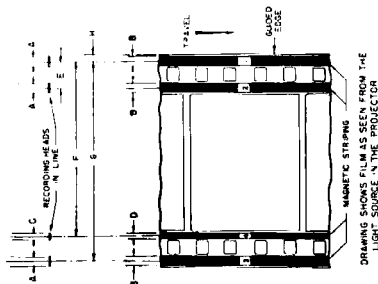
Track 1 shall be used for the left (as viewed from the auditorium) loudspeaker channel. Track 2 shall be used for the center loudspeaker channel. Track 3 shall be used for the right loudspeaker channel. Track 4 shall be used for the surround loudspeaker or control signals, or both.

5. Picture-Sound Separation

The sound record shall be separated on the film from the center of the corresponding picture by 28 frames in the direction such that, in normal film motion, the picture first passes a given reference point and then the corresponding sound passes at a later time.

6. Revision of American Standard Referred to in This Document

When the following American Standard referred to in this document is superseded by a



Dimensions	Inches	Millimeters
A	0.059	1.50 min
B	0.063 ± 0.003	1.60 ± 0.08
C	0.036 ± 0.002	0.91 ± 0.05
D	0.038 ± 0.003	0.97 ± 0.08
E	0.171 ± 0.002	4.34 ± 0.05
F	1.148 ± 0.002	29.16 ± 0.05
G	1.298 ± 0.002	32.97 ± 0.05
H	0.040 ± 0.002	1.02 ± 0.05

revision approved by the American Standards Association, Incorporated, the revision shall apply:

American Standard Dimensions for 35mm Motion-Picture Film, CS-1870, PH22.102-1956

NOTE: The dimensions given in this standard are predicated on the use of unshrunk film. It is recognized, however, that in practice, one may encounter some shrinkage when stripping a processed print. Specific measurements should take into account the overall width of the film as specified by Dimension A in American Standard PH22.102-1956. Should the film width fall outside the permissible tolerance, all dimensions specified in this standard may be multiplied by the ratio of nominal dimensions determined as follows:

$$\frac{\text{Measured width}}{\text{Specified width}} = \text{Ratio of nominal dimensions}$$

NOT APPROVED