

cated through joint effort. The committee foresees many problems requiring their attention, including advancements in theater sound, motion-picture print life (including wear and tear), technical requirements of automation, theater acoustics and equalization, screen illumination characteristics, geometry, seating, and so forth.

In the middle of October in 1978, there was a national meeting of NATO, and the Joint Committee decided to provide its first position paper by addressing the question of stereo-optical sound for motion-picture release prints. Stereo sound, of course, had been tried in many ways, and you will probably remember the first significant commercial venture with Walt Disney's *Fantasia*.

In 1954, Frayne proposed dual-bilateral stereo tracks, but the technique was not commercially accepted because of low signal-to-noise ratio. This concept was revised by Ron Uhlig in 1974 to encompass the process of Dolby noise reduction, and a new method of distributing stereo prints, potentially compatible, to theaters was at hand. Approximately 20 theatrical releases have been produced with stereo-optical sound, and an equal number are in preparation.

The theater owner is confronted with the demands of evaluating his theater's potential for stereo-optical sound and making decisions pertaining to new hardware and installation. To fulfill the theater owners' need for knowledge, I had the privilege of chairing the first ad hoc committee and presenting our joint report to the national meeting of NATO in mid-October. The reports we have had to date indicate that it was extremely well-received. We are looking forward to further cooperation within the joint technical committees of NATO, MPAA, TEA, and SMPTE.

The Society is, of course, always willing to lend its knowledge and expertise to the good of the industry in any suitable way. Our eight engineering committees are always ready to directly address the problems within our discipline. When problems of greater magnitude require organizational cooperation, the Society will be receptive to these needs in the future as it has been in the past. In summary, it should be remembered that the Society's engineering effort welcomes the participation of all interested parties whether they are members of the Society or not.

Standards & Recommended Practices

Proposed SMPTE Engineering Committee Recommendations

Two Proposed SMPTE Engineering Committee Recommendations are published here for a trial period: ECR 3, Projection for Technical Conferences; and ECR 4, Audio Reinforcement for Technical Conferences.

Comments on the proposals should be addressed to Alex E. Alden at Society Headquarters prior to 1 August 1979. If no adverse criticism is received, they will be submitted to the Society's Board of Governors for approval.

Approved International Standard

The International Organization for Standardization (ISO) recently approved an International Standard, the technical content of which is published here for your information. ISO 3773-1978, Cinematography — Tape Splices for 8-mm Type S Motion-Picture

Film for Projector Use — Dimensions, is in agreement with American National Standard PH22.172.2-1976.

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Approved Withdrawal of American National Standards

A recommendation for withdrawal of approval of two American National Standards was approved by the American National Standards Institute on 4 January 1979. PH22.141-1974, Dimensions for 32-mm Motion-Picture Film, 2R; and PH22.142-1974, Dimensions for 32-mm Motion-Picture Film, 4R, were withdrawn because the motion-picture films specified are not being manufactured. — Alex E. Alden, *Manager of Engineering Services*

Projection for Technical Conferences

1. *Scope*

This recommendation specifies the minimum conditions and parameters for effective presentation of papers at technical conferences, below which the use of the facilities must be questioned.

2. *Auditorium*

- 2.1 The ambient light shall meet the requirements specified in Section 3.1.
- 2.2 The room shall be of sufficient dimension to permit an image size large enough to meet the requirements specified in Section 3.
- 2.3 There shall be no obstruction to projection or viewing of the projected image as viewed from the normal seating area.

3. *Projection*

- 3.1 Ambient Light. The ambient light level shall be as low as local building codes permit.
- 3.2 Stray Light. There shall be no stray light from any source that would interfere with viewing the projected image.
- 3.3 House Lights. House lights shall be controllable by the projectionists.
- 3.3.1 There shall be a compromise switching between full and minimum house lights to permit note-taking.

1. *Projected Image*

- 4.1 Conventional Format. The luminance at the center of the screen shall be 33 ± 7 cd/m² for 16, 35-, and 70-mm motion pictures projected in accordance with American National Standard Screen Luminance and Viewing Conditions for Indoor Theater Projection of Motion-Picture Prints, PH22.196-1978.

Page 1 of 2 pages

- 4.1.1 The image light level shall be adjusted upward to maintain required contrast if local codes require substantial ambient light.
- 4.2 Small Format. The luminance at the center of the screen shall be as specified in Section 4.1 for motion-picture formats smaller than 16-mm.
- 4.3 Slides. Slides shall be projected at an image light level of at least 86 cd/m² or 130 times the ambient light level.
- 4.4 Stendness. The image shall be sufficiently steady to permit legibility of fine lines.

3. *Image Size*

- 5.1 The last row of seats shall not be farther from the screen than eight times the smallest dimension of any projected format, which is usually the height of the image but may be the width of vertical slides.
- 5.2 The first row of seats shall be at least two times the smallest dimension of the most nearly square projected format.
- 5.3 Should vertical slides require a smaller image than horizontal slides, the smallest dimension of the vertical image shall be the dimension referred to in Section 5.1.
- 5.4 The image shall be free of hot spots. Evenness of illumination shall be within applicable standards as specified in Section 3.1.
- 5.5 With no film or slide in the gate, the color temperature of the light reflected from the screen shall approximate 5400 K.
- 5.6 The image shall be essentially free of keystone distortion.
- 5.7 The screen, when illuminated by white light from the projector, shall show no visible image due to seams, wrinkles, scratches, discolorations, etc.

Page 2 of 2 pages

b. *Equipment*

- 6.1 Projection equipment shall be operable throughout the conference period.
- 6.2 The equipment shall be as quiet as possible. (See Section 6.5.)
- 6.3 Projection equipment shall be installed so as to block the least number of seats.
- 6.4 Projection equipment, preferably, shall be installed in a permanent projection booth.
- 6.5 If installation in a permanent projection booth is impracticable, projection equipment shall be installed behind the rear-most seats, with the exception of an overhead projector operated by the author. In such a case, the projection equipment and operators shall be shielded from the audience by a suitable sound and light barrier or heavy drapes.

- 6.6 Slide projectors shall be activated by remote control by the author.
- 6.7 A projected-light pointer shall be provided to the author.
- 6.8 Temporary wiring for control, sound, or power service shall be installed in accordance with local codes.
- 6.9 Signal lights shall be used by the chairman to notify the author two minutes before and at the end of his allotted time.
- 6.10 Remote-control devices shall display the paper number inside and outside the auditorium.

7. *Projectionists*

An appropriate number of qualified projectionists shall be available for each technical session.

*Audio Reinforcement for Technical Conferences*1. *Scope*

This recommendation specifies the minimum conditions and parameters for effective presentation of papers at technical conferences, below which the use of the facilities must be questioned.

2. *Auditorium*

The room shall meet the noise level requirements specified in Section 3.

3. *Ambient Noise*

3.1 With air-conditioning and projection equipment operating (without sound), ambient noise shall not exceed 35 dBA at any location in the normal seating area, measured on equipment specified in American National Standard Specification for Sound Level Meters, SI-4:1971 (R1976).

3.2 When the conference room shares a common or temporary wall, the ambient noise readings shall be made with the audio reinforcement, air-conditioning and projection facilities of the adjoining room in operation.

1. *Audio Reinforcement*

1.1 The audio reinforcement system shall be capable of providing a signal at least 25 dB above the ambient noise level throughout the audience area.

1.2 The audio reinforcement system shall have less than 15 percent articulation loss of consonants, as measured by Peutz-Klein techniques.

4.2.1 As an alternate condition for rooms smaller than 400 m³, the signal-to-noise ratio in the 2 kHz octave band shall be over 20 dB. Rooms under 200 m³ may not require sound reinforcement.

4.3 Microphones shall be provided for the chairman, author, and audience.

4.4 The chairman and author shall be able to hear each other and the audience. Stage monitor speakers shall be provided, if necessary.

5. *Audio Reinforcement Equipment*

5.1 Equipment shall permit equalization of the required microphones.

5.2 To tape record portions of sessions, a feed shall be provided at a point in the system which will ensure the best possible recording.

5.3 If necessary, provision shall be made to receive an audio feed from telephone lines and to feed a signal to telephone lines.

6. *Audio Reproduction*

6.1 The motion-picture audio reproduction system preferably shall be separate from the audio reinforcement system.

6.2 Motion-picture audio reproduction speakers preferably shall be installed behind a perforated screen which meets applicable standards.

6.3 Provision shall be made to reproduce tape or other prerecorded material through either the main audio reinforcement or audio reproduction system.

7. *Recording*

7.1 If broadcast-quality recording is required, suitable equipment shall be provided.

7.2 If only secretarial recordings are required, simple cassette-type recorders may be employed.

Cinematography — Tape splices for 8 mm Type S motion-picture film for projector use — Dimensions

spliced film should be aligned so that when one portion of the film is placed against a straightedge, the other portion will not deviate more than 0.35 mm (0.014 in.) in 15.2 cm (6 in.).

3.5 Except as described in 3.6, the dimensions of the tape applied to secure the splice shall be such as not to interfere with the film dimensions as specified in ISO 1700, and shall fall within the area described by dimension F. The width of the tape material used to form the splice should encompass the full width of the film if applied only to one side; however, if also applied to the second side, it may exclude the perforation area or the area of the magnetic record and balance stripes or both.

3.6 If the tape used to form a splice is wrapped around the film, either film edge may be used as the wrap-around edge. However, if the perforated edge is used, it is recommended that the splice add no more than 0.05 mm (0.002 in.) to the film width nor limit the perforation dimension by the same amount. The overall width of the spliced area shall not exceed 8.15 mm (0.321 in.). If the film is slit after the wrap-around splice has been made, the film width shall not be less than 7.92 mm (0.312 in.) and the slitting operation shall not affect the perforated edge of the film.

3.7 The splice shall be made with the mated cuts of the film ends butting together as closely as possible, so that no white light shows between the film ends at the time of projection, and there shall be no overlap of the film at the splice.

NOTE — Based on present technology, films joined with tape splices are not acceptable for use as originals in commercial printing operations.

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies the dimensions of mated cut splices on 8 mm motion-picture film perforated 8 mm Type S made with a transparent adhesive tape. The specifications herein apply to magnetic and photographic sound films as well as silent films intended only for projection.

2 REFERENCES

ISO 1700, *Cinematography — 8 mm Type S motion-picture raw stock film — Cutting and perforating dimensions*.
ISO 3642, *Cinematography — Cement or welded splices for 8 mm Type S motion-picture film — Dimensions*.

3 DIMENSIONS AND CHARACTERISTICS

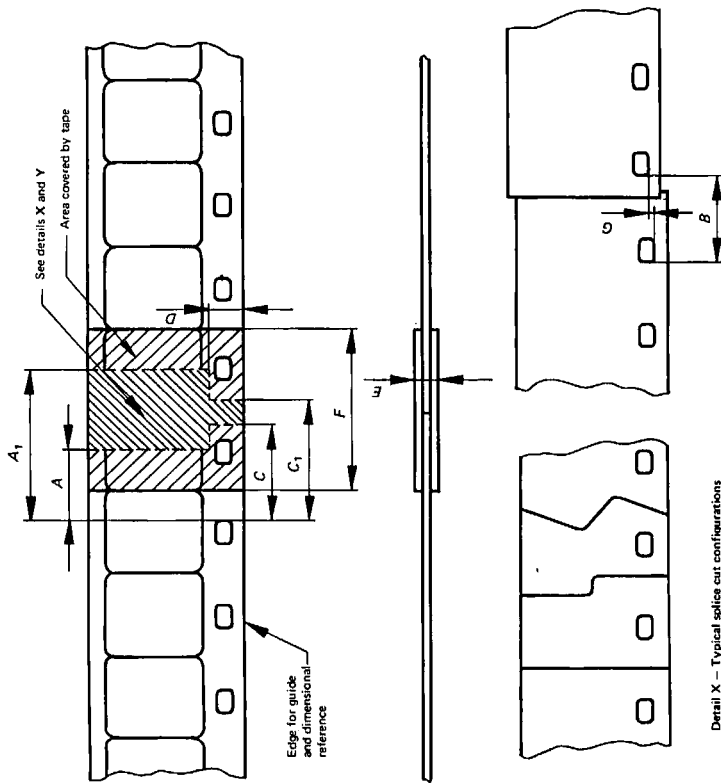
3.1 The dimensions shall be as shown in the figure and given in the table. These dimensions apply to a freshly made splice.

3.2 The transverse mated cut of the films shall fall within the area defined as detail X in the figure.

3.3 The spliced films shall not be offset more than 0.05 mm (0.002 in.), dimension G, as measured by the differences in the alignment of the reference slide edge of the perforation holes on either side of the spliced halves (see detail Y).

3.4 In the plan view, the angle between the respective edges of the spliced film should be 180° ± 8'. Thus, the

ANNEX



Detail X — Typical splice cut configurations

Detail Y — Alignment dimensions

Dimension	mm	in.*
A min.	3.65	0.144
A ₁ max.	7.90	0.311
** B max.	4.28	0.168 5
min.	4.18	0.164 6
C min.	5.0	0.20
C ₁ max.	6.5	0.26
D min.	1.6	0.06
E max.	0.27	0.010 6***
F max.	25.4	1.00
G max.	0.05	0.002

* The metric values are primary and the values in inches are derived and purposely noted with more significant places.
 ** Dimension B (detail Y) is the distance between common sides of successive perforations measured across the splice.
 *** This includes a maximum thickness for magnetic sound stripe of 0.020 mm (0.000 8 in) as specified in ISO 3027.

A.1 The transverse cut to provide the mated pairs of films for tape splice may be made in numerous configurations. Detail X of the figure shows only some typical configurations. It is desirable, however, to make the splice as inconspicuous as possible, and, therefore, the transverse cuts would usually be on the frame line or occur in one frame only.

A.2 Dimension B controls the longitudinal registration of the two films being spliced. It is measured across the one pitch length containing the cut. It is recognized that splicing blocks are usually constructed having registration pins more widely separated. When this is done, manufacturers are cautioned to allow for possible film shrinkage characteristics, depending on the film type.