port that will: (1) summarize its activities; (2) review the pros and cons and other considerations involved in the use for ancillary signals in: the horizontal blanking interval, the vertical blanking interval, the program audio, and the program video signal; (3) recommend a master line allocation plan for the vertical interval; and (4) recommend a set of guidelines against which future ancillary signal proposals may be evaluated.

Study of Television Sound

In review, the purpose of the JCIC Ad Hoc Committee for the Study of Television Sound is to examine the entire television sound system from the studio origination to the sound heard in the home in order to identify problems and opportunities for improvement and to assign tasks to appropriate organizations to accomplish these improvements.

The organization of the committee and a detailed description of its scope and objectives was reported by Daniel R. Wells, the Ad Hoc Committee Chairman, in last year's NAB Proceedings. A detailed status report appeared in the June 1976 issue of the *SMPTE Journal.*

All aspects have not been covered to date, and some assignments remain. However, work is progressing in the six panels on: Production, Distribution, Broadcasting, Reception, Cable and Master Antennas, and State-of-the-Art Techniques.

Progress is anticipated during the coming year on the following:

A. The correlation between incidental phase of the visual transmitter with the audio SNR of the home viewer.

B. Audio Subcarrier Modulation Deviation and whether double or triple the present ±25 kHz deviation can be achieved with current circuitry.

C. Possible further testing of 75 μs vs 25 μs preemphasis curve and the relationship of limiting at the television receiver.

D. Whether there should be a "standard" for peak reading meters?

E. How to test harmonic distortion in audio channels composed of multiplexed telephony circuits.

Some of these projects are in the definition stage and Mr. Wells would appreciate any comments or suggestions you may have.

Color Television Study Committee

The Color Television Study Committee was organized in 1968 under the administration of the SMPTE. The charge to the group by the JCIC was to single out causes for variations in color television pictures viewed in the home, particularly in regard to variability in hue, saturation, and color quality. During the committee's eight-year term, its work touched on all elements of production, reproduction, and broadcast transmission to reception with the home receiver.

Basically, the JCIC role in the committee's activity has been fulfilled and its chairman, K. Blair Benson, recommended it be disbanded with all work assigned. Responsibility for Color Transmission Standards has been assigned to the EIA BTS Committee, and work is continuing on the video wave form specifications (TR4.4.2). Monitor standards are similarly assigned and work is continuing under EIA TR 4.4.2.

Most of the work has been directed toward the problem of colorimetric uniformity in film and live origination and with color fidelity of display devices. Several years ago this activity was assigned to the SMPTE and is organized as a subcommittee under the Television Video Technology Committee with Leroy DeMarsh as chairman.

The FCC Rules and Regulations are based upon NTSC phosphors. Because phosphors, in current commercial use, differ significantly from NTSC specifications and because the EBU phosphor recommendations also differ, a very extensive study was undertaken for the JCIC committee to determine if the NTSC standard required modification.

The consensus arrived at and reaffirmed is that we should retain the NTSC phosphor standard and take steps or undertake studies to bring current commercially available monitors into conformity.

Acknowledgments: Because of the limited time available for the presentation of the report to the NAB, it could not adequately document the many hours of dedicated effort of the committee participants and the leadership of the ad hoc and subcommittee chairmen working to our mutual benefit. In acknowledging our appreciation to them, we also recognize the support of their sponsoring companies in providing time, travel and understanding cooperation. Our work continues.

Standards & Recommended Practices

Approved American National Standards

On 17 March 1977, the American National Standards Institute approved two American National Standards: PH22.194-1977, Projector Usage of 35-mm Release Prints Having Four Perforations Per Picture Frame, and PH22.195-1977, Dimensions of Projectable Image Area on 35-mm Motion-Picture Prints. They are revisions, consolidations and redesignations of PH22.3-1961 and PH22.103-1966, and PH22.58-1969 and PH22.106-1971, respectively. The specifications were combined to increase their usefulness.

Withdrawal of American National Standards

On 16 February 1977, the American National Standards Institute approved withdrawal of six American National Standards: PH22.43-1970, Specifications for 16-mm 3-kHz Flutter Test Film, Photographic Type; PH22.65-1969, Specifications for Scanning-Beam Uniformity Test Film for 35-mm Motion-Picture Sound Reproducers; PH22.98-1963 (R1969), Specifications for 35-mm Three-Track Flutter Test Film, Magnetic Type; PH22.99-1969, Specifications for 35-mm Three-Record Azimuth Alignment Test Film, Magnetic Type; PH22.113-1966 (R1971), Specifications for 16-mm 3000-Hertz Flutter Test Film, Magnetic Type; and PH22.114-1969, Specifications for 16-mm Azimuth Alignment Test Film, Perforated One Edge, Magnetic Type.

Withdrawal action was initiated because all standards specifying test materials are being transformed into SMPTE Recommended Practices. SMPTE Recommended Practices RP 70, 69, 75, 77, 76 and 78 have replaced PH22.43, .65, .98, .99, .113 and .114, respectively. — Alex E. Alden, *Manager of Engineering Services.*

PH22.194-1977
Revision and Consolidation of PH22.3-1961 and PH22.103-1966

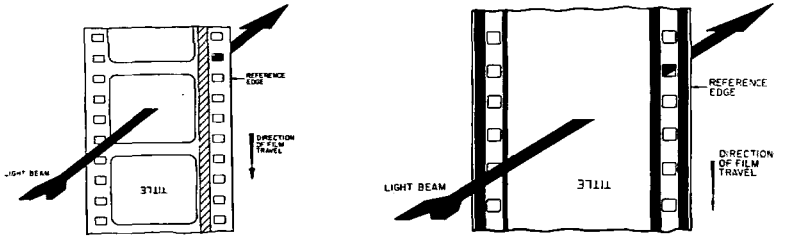
American National Standard specifications for projector usage of 35-mm release prints having four perforations per picture frame

Approved March 17, 1977 Secretariat: Society of Motion Picture and Television Engineers

1. Scope

1.1 This standard specifies the position of the emulsion for 35-mm motion-picture release prints having four perforations per frame and the position of the magnetic striping relative to the projector lens.

1.2 The standard also specifies the rate of projection for systems defined in Sec. 1.1 and the relevant standards on location of the picture and sound records.



PHOTOGRAPHIC SOUND PRINT **MAGNETIC SOUND PRINT**

View as Seen through Film toward Lens

2. Position of Photographic Emulsion and Magnetic Striping

2.1 The photographic emulsion shall be on the side of the film which faces away from the projector lens. The projectable image area is specified in American National Standard Dimensions of Projectable Image Area on 35-mm Motion-Picture Prints, PH22.195-1977.

2.2 The magnetic striping shall be on the side of the film which faces the projector lens. Relevant standards on sound records are listed in Appendix A2.

3. Projection Frame Rate

The rate of film travel through the projector shall be 24 frames (96 perforations) per second which is approximately 90 ft (27.4 m) per minute or 18 in (45.7 cm) per second.

4. Framing Adjustment

It is customary to provide a vertical framing adjustment movement of at least 0.315 in (8.00 mm) above and below the normal image position, as specified in ANSI PH22.195-1977.

Appendix

(The Appendix is not a part of this American National Standard, but is included for information purposes only.)

A1. Positioning of Sound Records

When the sound records are reproduced, the distance from the sound-scanning point to the center of the projector aperture shall be adjusted so as to bring the picture and sound into synchronism for the average observer. Since sound travels at a rate of about 1100 ft (335 m) per second (approximately 50 ft [15 m] in 1/24 second), synchronism can be achieved by repositioning the sound record in the projector one frame for every 50 ft from the average observer.

A2. Sound Record Standards

Dimensions of sound records are specified in the following American National Standards:

Dimensions of Photographic Sound Record on 35mm Motion-Picture Prints, PH22.40-1967

Position, Dimensions and Reproducing Speed of Four Magnetic Sound Records on 35-mm Motion-Picture Release Prints, PH22.137-1974

PH22.195-1977
Revision and Consolidation of PH22.58-1969 and PH22.106-1971

American National Standard
dimensions of projectable image area on 35-mm motion-picture prints

Approved March 17, 1977 Secretariat: Society of Motion Picture and Television Engineers

1. Scope

1.1 This standard specifies the maximum dimensions of the film image area intended for projection from a 35-mm motion-picture film and the placement of this area relative to the perforations and the reference edge of the film.

1.2 The standard specifies three types of image areas intended for theatrical projection (see Appendix A4):

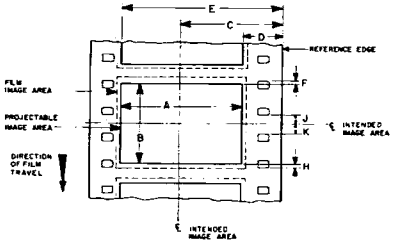
Style A: General theatrical release prints commonly referred to as nonanamorphic or wide screen

Style B: Theatrical release prints with an anamorphic image

Style C: Documentary-type theatrical prints

2. Dimensions

The dimensions shall be as given in the figure and tables.



Projectable Area on Film as Seen through Film toward Lens

Table 1
Styles A and C

Dimensions	Inches	Millimeters
A	0.825 ref	20.96 ref
B (Style A)	0.446 min	11.33 min
B (Style C)	0.602 nom	15.29 nom
C*	0.738 ref	18.75 ref
D	0.324 min	8.23 min
E	1.151 max	29.24 max
F = H	within 0.012	within 0.30
J = K	nominally equal	nominally equal

*See Appendix A1.

Table 2
Style B

Dimensions	Inches	Millimeters
A	0.838 nom	21.29 nom
B	0.700 max	17.78 max
C*	0.738 nom	18.75 nom
D	0.318 min	8.08 min
E	1.158 max	29.41 max
F = H	within 0.012	within 0.30
J = K	nominally equal	nominally equal

NOTE 1. Projector Aperture: Dimensions B, D and E define the image area on the film that is available for projection. They do not define the opening in the projector aperture plate. The size of this opening may differ from Dimensions A and B, for example, because of the physical separation necessary between the aperture plate and the film to avoid scratching the film, the slant of the marginal rays accepted by the projection lens, etc.

NOTE 2. Actual Projected Area: It is recognized that, in many cases, the actual film image area that is projected may be smaller than the projectable maximum and, in some cases, may be nonrectangular (for example, an irregular four-sided figure bound by either straight or curved lines). Such departures may result from equipment considerations, such as slight inconsistencies among lenses, screen sizes, etc.; from geometric limitations such as the screen surface being at an angle other than 90° from the projection axis, or being nonplanar or both; and from aesthetic considerations such as pictorial composition within more restrictive image limits. In the absence of specific instructions to the contrary, it is intended that the actual projected film image area be the largest appropriately-shaped figure that can be inscribed within the specified dimensions.

Appendix

(The Appendix is not a part of this American National Standard, but is included for information purposes only.)

A1. Centerlines

The centerlines of the image area are given for convenience in interpreting the standard, facilitating such applications as the optical design of equipment and assisting in the understanding of suitable mechanical embodiments related to projectable image area. Note that the centerline of the projectable image areas is displaced from the centerline of the film by 0.050 in (1.27 mm) nominal.

A2. Related Standards

The following American National Standards define image areas for other important phases of motion-picture operations and are consistent with this standard and with one another under currently acceptable commercial practices:

Dimensions of 35 mm Motion-Picture Camera Aperture Images, PH22.59-1974

Dimensions of Exposed Areas for Picture and Photographic Sound on 35 mm Motion-Picture Prints Made on Continuous Contact Printers, PH22.111-1965 (R1975)

A3. Image Area for Television

It is recognized that home television receivers are adjusted to show a distribution of picture sizes, ranging downward from the maximum. Guides to picture composition, based upon a statistical survey of receivers in use, are presented in SMPTE Recommended Practice RP 27.3-1972, Specifications for Safe Action and Safe Title Areas Test Pattern for Television Systems. Note that some portion of the audience will see the entire transmitted area, but for certainty in presentation of critical information over broadcast television, such information should be confined to a smaller, central area.

A4. Typical Aspect Ratios for Nonanamorphic Theatrical Projection

For aesthetic and practical reasons, theatrical projection may present 35-mm images in such a manner that the full width of the projectable area is shown but the projected height is less than maximum. Photography designed primarily for theatrical exhibition recognizes this and is composed for the more elongated rectangles. Several aspect ratios for the final projected picture are recognized through usage:

Style	Aspect Ratio	Projectable Image Height Inches	Millimeters
A	1.85:1	0.446 min	11.33 min
A	1.75:1	0.471 ref	11.96 ref
A	1.66:1	0.497 ref	12.62 ref
C	1.37:1	0.602 nom	15.29 nom

In every case, it is intended that the projected area be symmetrically located about the horizontal centerline of the maximum projectable area.

It is recommended that pictures designed to be shown at aspect ratios other than those specified in this standard be so marked in a conspicuous manner. The Universal Leader (described in American National Standard Leaders and Cue Marks for 35- and 16-mm Sound Motion-Picture Release Prints, PH22.55-1975) provides for aspect ratio identification on frames 6-10.