SMPTE Technical Conference and Equipment Exhibit

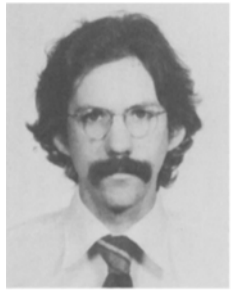
Prominent Coverage Due for Motion Picture and Television History

Since its founding 64 years ago, the Society of Motion Picture and Television Engineers has been notable not only for making history — in the engineering and technology related to motion pictures and television — but also for recording that history for posterity. This is important because a proper sense of the future presumes an appreciation for the past. In recognition of this, Richard Marcus (Program Chairman for the Society's 122nd Conference, to be held 9-14 November 1980 in New York City) has chosen to give historical papers a prominent place on the program such as is ordinarily reserved for only technical presentations.

As the newly appointed chairman of the Society's Archival Papers and Historical Committee, I was asked by Mr. Marcus to secure approximately ten papers for presentation at the Conference. Furthermore, I was asked to make any other appropriate efforts that might enhance the historical aspect of the Conference.

On the principle that broad topics are of more interest than unduly specialized ones, we are soliciting papers that trace the evolution of a concept rather than papers relating to a perfected technology or item of hardware. Five solidly historical papers have thus far been chosen: First is one on the origins of the cinema, by a distinguished collector of photographica. Another will outline, in an unusual fashion, the development of the 1926 Vitaphone sound-on-disk motion picture process. The development of mechanical scanning television systems will be the subject of a paper by an author who is widely regarded as America's foremost historian of television. The history of the videotape recorder will be detailed for us by an engineer who played a significant role in that development. Finally, one of our top engineers will offer a paper on the development of color television up to the acceptance of the NTSC standard, still a matter of some controversy.

In addition to papers, we are planning a series of exhibits that will be on display in the main exhibition room. Available for examination will be a collection of 19th century motion-producing devices such as Zoetropes and phenakistiscopes, and an assortment of cameras, projectors, iconoscopes and more. In a special exhibit designed to honor SMPTE founder C. F. Jenkins, we plan to have on display items relevant to his career as pioneer experimenter in both motion pictures and television; some of these items will be on loan from the Smithsonian Institution by special arrangement.



Stephen C. Chamberlain, Historical Papers Associate Chairman

Richard S. Marcus, 122nd SMPTE Conference Program Chairman

Motion picture and television history is not an aspect of archeology, with its bones buried beneath the dust of the centuries. Rather, it provides a vital frame of reference — a lodestone in effect — for judging our progress and direction as we face an uncharted future.

We welcome any inquiries or suggestions regarding the program. Please write to:

Stephen C. Chamberlain, Historical Papers
Apt. 53
181 Claremont Ave.
New York, NY 10027

Standards & Recommended Practices

Proposed American National Standards

Proposed revisions of two American National Standards are published here for a trial period and public review: PH22.73, Dimensions for 35-mm Motion-Picture Film Perforated 32-mm, 2R; and PH22.165, Dimensions for 35-mm Motion-Picture Film Perforated 8-mm Type S, 5R (1-3-5-7-0). PH22.73 has been expanded to include dimensions of the 16-mm strip after processing and slitting. PH22.165 reflects the addition of short-pitch dimensions.

Comments should be addressed to Alex E. Alden, Manager of Engineering Services, at Society Headquarters before 1 August 1980. The proposals have been submitted to American National Standards Committee PH22. Consequently, all comments received

Reaffirmed SMPTE Recommended Practices

The Executive Committee for Standards Approval, acting on behalf of the Board of Governors, approved the reaffirmation of two SMPTE Recommended Practices on 6 March 1980: RP 29-1968, Video Test Tape for Quadruplex Video Frequency Magnetic Tape Recorders Operating at 15 in/s and Practice LBM of SMPTE Recommended Practice RP 6, and RP 57-1974, Vertical Interval Reference (VIR) Signal.

SMPTE Recommended Practices are available from Society Headquarters for $1.50 each. — *Alex E. Alden, Manager of Engineering Services*

Proposed American National Standard

imensions for 35-mm Motion-Picture Film Perforated 32-mm, 2R

PH22.73

Revision of PH22.73-1974

1. Scope

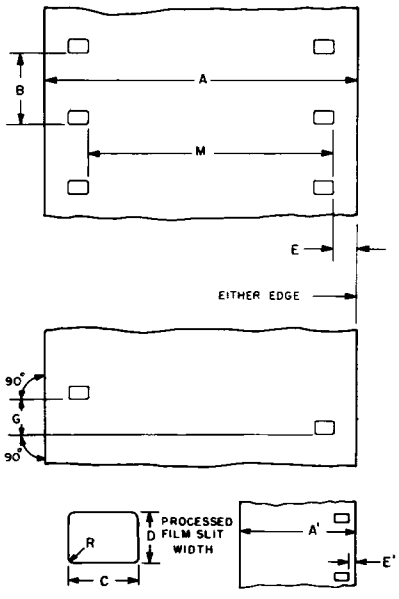
standard specifies the cutting and perfor- dimensions for 35-mm motion-picture film two rows of 16-mm type perforations, one ear each edge of the 35-mm film, and a ation pitch of either 0.2994 or 0.3000 in or 7.620 mm). The width of the 16-mm ter processing and slitting is also specified.

2. Dimensions

e dimensions shall be as given in the fig- d table.

e dimensions pertain to a safety film as de- in American National Standard Specifi- for Motion-Picture Safety Film, ANSI 31-1967 (R1973).

cept for Dimensions A' and E', the dimen- pply at the time of cutting and perforating adjusted to a temperature of 23 ± 1°C aly converted to 73 ± 2°F) and a relative ty of 50 ± 2 percent. The manufacturer dicate other nominal temperature and hu- conditions under which the dimensions ap- mensions A' and E' apply immediately after .



Dimensions	Inches	Millimeters
Film width	1.377 ± 0.001	34.975 ± 0.025
Film width after processing and slitting	0.627 ± 0.002	15.93 ± 0.05
Perforation pitch (long)	0.3000 ± 0.0004	7.620 ± 0.010
Perforation pitch (short)	0.2994 ± 0.0004	7.605 ± 0.010
Perforation width	0.0720 ± 0.0004	1.829 ± 0.010
Perforation height	0.0500 ± 0.0004	1.270 ± 0.010
Edge to perforation	0.096 ± 0.002	2.44 ± 0.05
Edge to perforation after processing and slitting	0.0355 ± 0.0020	0.902 ± 0.051
Perforation misalignment	0.001 max	0.03 max
100 consecutive perforation pitches (long)	30.00 ± 0.03	762.0 ± 0.8
100 consecutive perforation pitches (short)	29.94 ± 0.03	760.5 ± 0.8
Lateral perforation displacement	1.113 ± 0.001	28.27 ± 0.03
Radius of perforation fillet	0.010 ± 0.001	0.25 ± 0.03

NOTE 1: The title of this standard was established by the application of a nomenclature system developed for all film dimension standards. Each title provides an indication of the film width, a code designation for the perforation shape (BH, KS, DH, or CS) or the number of rows of perforations (1R, 2R, etc.), depending upon which is the significant factor, or the perforation pitch without the decimal point.

NOTE 2: The metric conversion of Dimension A is purposely chosen and shown to three decimal places to prevent the maximum width dimens 35 mm.

NOTE 3: Dimension A' represen Dimension E' the edge-to-perforati ting a nominal 16-mm strip from t essed parent 35-mm width film. In c of 0.627 in (15.93 mm), the spe characteristics described in Appendi into account.

Appendix

(The Appendix is not a part of this American National Standard, but is included for information purpos

A1. The user is reminded that, as a plastic, film can change dimensions temporarily due to moisture or temperature, or permanently due to solvent loss or strain effect.

A2. Film for positive use has a longitudinal pitch 0.2 percent longer than its companion negative. Shrinkage of the negative during aging and processing prior to printing will generally not exceed 0.2 percent. Thus, the negative stock is expected to be 0.3 ± 0.1 percent shorter than the positive. This difference will minimize slippage between the two on the 12-inch (305-mm) circumference sprocket of the printer, assuming a film thickness of 0.0055 to 0.0065 in (0.140 to 0.165 mm).

A3. The uniformity of pitch, hole mensions B, C, D, and E) is an import steadiness. Variations in these dim roll, are of little significance compa one perforation to the next within consecutive perforations. As an ex of the margin is uniquely critical During the printing process, the pl on the film is usually with respect pairs of perforations at one-frame sequent projection, however, the projected is usually located, not b but by the edge of the film. The lat projected image is, therefore, di frame-to-frame uniformity of the m

Proposed American National Standard

imensions for 35-mm Motion-Picture Film Perforated 8-mm Type S, 5R (1-3-5-7-0)

PH22.165

Revision of
PH22.165-1973

1. Scope

standard specifies the cutting and perfor- dimensions for 35-mm motion-picture film our rows of 8-mm Type S perforations and w of special perforations having a perfora- tch of either 0.1664 or 0.1667 in (4.227 or mm). The film stock described in this stand- intended for the production of prints. The of the 8-mm strip after processing and slit- also specified.

2. Dimensions

2.1 The dimensions shall be as given in the figure and table.

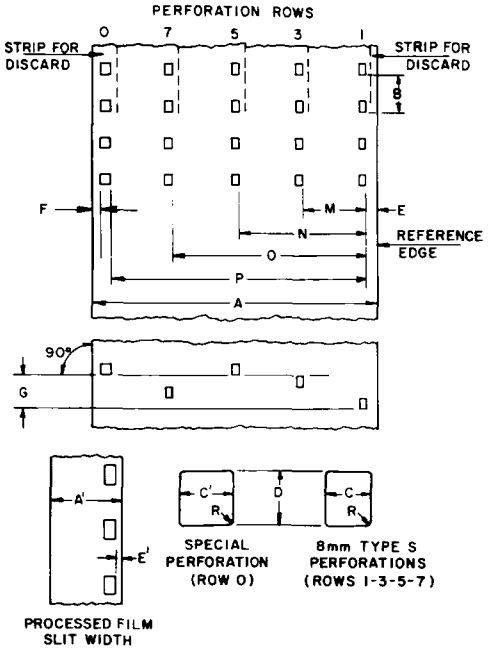
2.2 The dimensions pertain to a safety film as defined in American National Standard Specifications for Motion-Picture Safety Film, ANSI PH22.31-1967 (R1973).

2.3 Except for Dimensions A' and E', the dimensions apply at the time of cutting and perforating for film adjusted to a temperature of 23 ± 1 C (nominally converted to 73 ± 2 F) and a relative humidity of 50 ± 2 percent. The manufacturer may indicate other nominal humidity conditions under which the dimensions apply.

E 1: The title of this standard was established by lication of a nomenclature sytem developed for dimension standards: Each title provides an indi- of the film width, a code designation for the per- shape (BH, KS, DH, or CS) or the number of rows orations (1R, 2R, etc.), depending upon which is ificant factor, and the perforation pitch without mal point.

umerals (1-3-5-7-0) have been added to the title tandard to specify how the rows of perforations ed on the film. The designation is necessary only e film stock is wider than its end use and more e combination of perforation rows is possible. For ype S perforations on 35 mm-width film, a maxi- four usable rows of perforations is possible. The ion rows shall be numbered starting at the ref- edge. The reference edge is the edge nearest to of perforations which is retained in one of the 8-mm strips that may be generated by appropriate slitting of the parent 35-mm film. A row of perforations which is discarded will always be given the number 0. Negative or intermediate films which are not slit may contain a 0-numbered row of perforations if that perforated row corresponds to the discard row of perforations on the subsequent print stock. For all films with nonsymmetrical perforation rows, there can be two different windings for *the same numbered rows of perforations*. Film perforated 1-0 would be 1-0 regardless of winding, but depending upon the location of the reference edge, the winding could be A or B, according to American National Standard Designation of A and B Windings for Motion-Picture Raw Stock, ANSI PH22.75-1975.

NOTE 2: The metric conversion of Dimension A is purposely chosen and shown to three decimal places to prevent the maximum width dimension from exceeding 35 mm.



	Dimensions	Inches
A	Film width	1.377 ± 0.001
A'	Film width after processing and slitting	0.314 ± 0.002
B	Perforation pitch (long)	0.1667 ± 0.0004
B'	Perforation pitch (short)	0.1664 ± 0.0004
C	Perforation width	0.0360 ± 0.0004
C'	Special perforation width	0.0450 ± 0.0004
D	Perforation height	0.0450 ± 0.0004
E	Edge to perforation	0.050 ± 0.002
E'	Edge to perforation after processing and slitting	0.020 ± 0.002
F	Edge to perforation	0.031 nom
G	Perforation skewness	0.0015 max
L	100 consecutive perforation pitches (long)	16.670 ± 0.016
L'	100 consecutive perforation pitches (short)	16.640 ± 0.016
M	Lateral perforation displacement	0.314 ± 0.001
N	Lateral perforation displacement	0.628 ± 0.001
N-M	Functional tolerance	0.314 ± 0.001
O	Lateral perforation displacement	0.942 ± 0.001
O-N	Functional tolerance	0.314 ± 0.001
P	Lateral perforation displacement	1.251 ± 0.001
P-O	Functional tolerance	0.309 ± 0.001
R	Radius of perforation fillet	0.005 ± 0.001

Appendix

(The Appendix is not a part of this American National Standard, but is included for information purpos

A1. The dimensions given in this standard, excluding Dimensions A' and E', represent the practice of film manufacturers in that the dimensions and tolerances are for film stock immediately after perforation. The punches and dies themselves are made to tolerances considrably smaller than those given, but since film is a plastic material, the dimensions of the slit and perforated film stock never agree exactly with the dimensions of the slitters, punches, and dies. Film can shrink or swell due to loss or gain in moisture content or can shrink due to loss of solvent. These changes invariably result in changes in the dimensions during the life of the film. The change is generally uniform throughout a roll.

A2. It will be noted that among the various standards for slitting and perforating film stock there are often two standards that seem much alike in wording. The difference lies in the longitudinal pitch which is either 0.1664 or 0.1667 in (4.227 or 4.234 mm). In general, the longer pitch is for print stock and the shorter pitch is for negative or intermediate stock.

The choice of pitch for negative or intermediate motion-picture film depends, within certain limits, on the type of printer to be used. Where release step-printers are used and the film is stationary when exposed, the choice of pitch is not strictly limited. Where the film moves continuously over a cylindrical surface at the time of printing (sprocket-type contact printer), there are three major considerations involved in choosing the pitch. These considerations are: (1) the sprocket diameter and tooth engagement, (2) the film thickness and (3) the film shrinkage and the rate at which shrinkage occurs.

Maximum steadiness and definition are secured on a sprocket-type printer when the negative stock is somewhat shorter in pitch than the positive stock in the approximate proportion of the thickness of the film to the radius of curvature. For printing on a 72-tooth sprocket (circumference of about 12 in [305 mm]) with film 0.0055 to 0.0065 in (0.140 to 0.165 mm) thick, the optimum pitch differential is 0.3 percent. The use of the ideal pitch differential for the negative would minimize slippage between the positive stock and negative during the printing operation, thus reducing the amount of blurring and jumping in the vertical axis of the picture or sound image. (This error is to be differentiated from the jump caused by nonuniformity of successive pitches, Dimension B.)

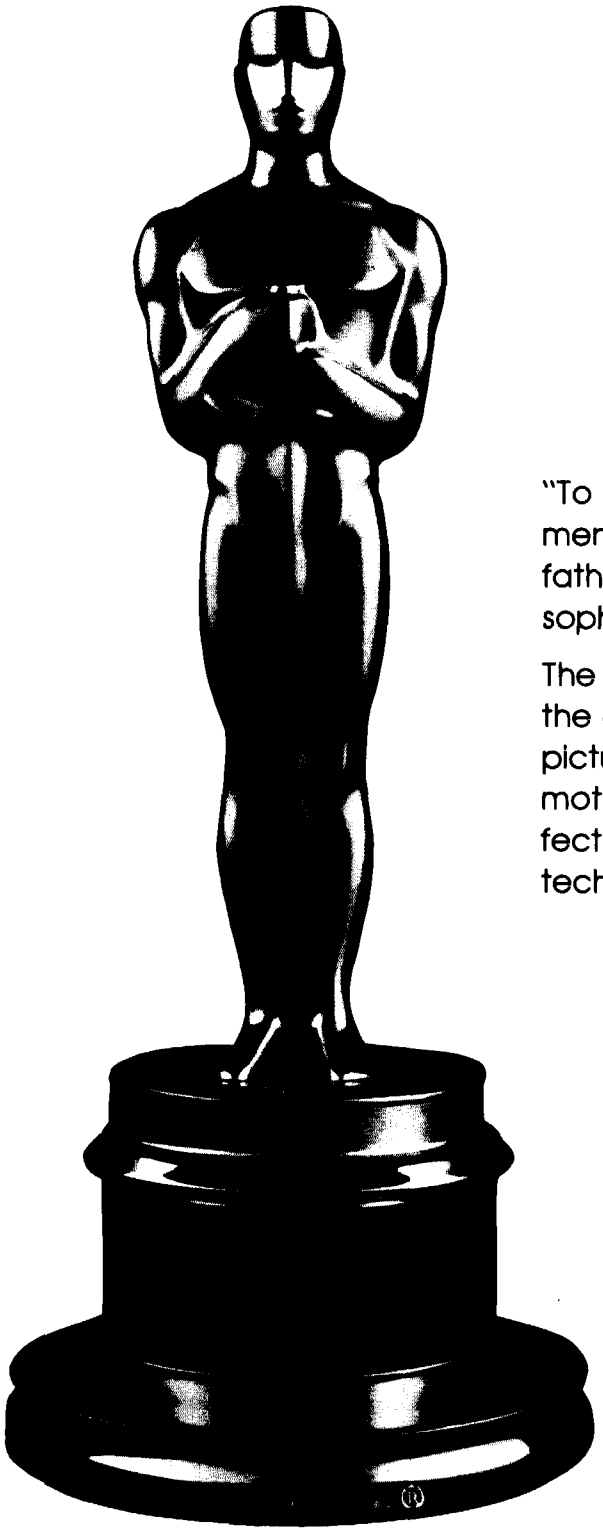
Experience has shown that the average pitch derived from Dimension L of the intermediate can vary ± 0.1 percent from the ideal pitch, which is 0.3 percent shorter than the positive stock, without blurring image being easily detected.

For many years this desired di caused by the shrinkage of the processing and aging. Current film the earlier ones and hence a shorte desirable. To satisfy this requiremer negatives, it is common manufact for a pitch value 0.2 percent sho stock onto which they will be pr shrinkage that occurs during proc that takes place before the release bring the pitch differential close desired value of 0.3 percent. A chosen for the negative or interme in (4.227 mm).

Low-shrinkage negative film pe mensions should not thereafter shr than 0.2 percent under normal us a reasonable life span, so that th ferential from the positive stock of maintained. (The film should be n bration with air at the conditions of perforating.)

A3. The uniformity of pitch, hole mensions B, C, D, and E) is an imp ing steadiness. Variations in these to roll, are of little significance co from one perforation to the next w of consecutive perforations. As an ity of the margin is uniquely critico During the printing process, the pl on the film is usually with respect pairs of perforations at one-frame i quent projection, however, the port jected is usually located, not by th by the edge of the film. The lateral jected image is therefore directly re frame uniformity of the margin.

A4. The tolerance for the slit width established to provide the laborato flexibility for the least critical appl 8-mm Type S prints. For some con such as photographic sound use, it the laboratory to consider much t these more critical uses, film shri must be taken into account, and ± 0.001 in (0.03 mm) variability.



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The Moviola has evolved from the 1924 Midget to the complex machine necessary for the array of picture and sound formats currently employed in motion picture production. It has kept pace effectively to meet the demands of motion picture technology."

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