arrives in the studio until the final edited newsfilm is available for broadcast.

There are, of course, news items which can be handled in a shorter time when there is none or very little editing work necessary. This can materially reduce the lapsed time from the exposed negative to broadcast time.

The editing table (Fig. 1), as well as the 16mm standard projector with an optical sound system, are provided in addition to the magnetic playback facilities because for some time to come, some sound effects and other materials will be available on optical soundtracks.

The third type of picture being produced in television studios is the kinescope recording. The editing procedure of these films is similar to the documentary films, the sound being recorded from a microphone or other sources on the magnetic 200-mil middle-track. The kinescope recordings are on black-and-white negative film as several prints are normally needed for distribution to different TV stations. After editing the kinescope program, the middle-track recording is played back and re-recorded on the striped edge track of the picture film.

This paper was not presented to describe the different and, in the most part ingeniously designed equipments, but to show from an editor's point of view that 16mm magnetic sound recording should be used in a TV film operation for its high quality and other advantages. The desirability of visually seeing the soundtrack is not as essential as we have all believed in the past. It is a matter of training to become accustomed to this technique. A long experimental period and nearly two years of official program transmission have proved the superiority of the magnetic sound not only in TV newsreels, but in documentary and kinescope recordings as well.

There is still room for improvements, of course, but the complete magnetic sound chain has achieved a stable performance in our TV film operation.

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motion-picture standards

Six American Standards

Published on the following pages are six American Standards, including revisions of three existing standards, approved by the American Standards Association in April, 1956:

PH22.9-1956—16mm Film Perforated Along Two Edges, Usage in Camera (Revision of Z22.9-1946)

PH22.10-1956—16mm Film Perforated Along Two Edges, Usage in Projector (Revision of Z22.10-1947)

PH22.48-1956—Picture Printer Aperture for Contact Printing 16mm Positive from 16mm Negative (Revision of Z22.48-1946)

PH22.88-1956—Magnetic Coating of 8mm Motion-Picture Film

PH22.97-1956—200-Mil Magnetic Sound Record on 16mm Film Base, Perforated One Edge

PH22.101-1956—Magnetic Coating of 16mm Film Perforated Along Both Edges

A history of the development of the above-mentioned standards accompanied their trial publication in the Journals indicated below:

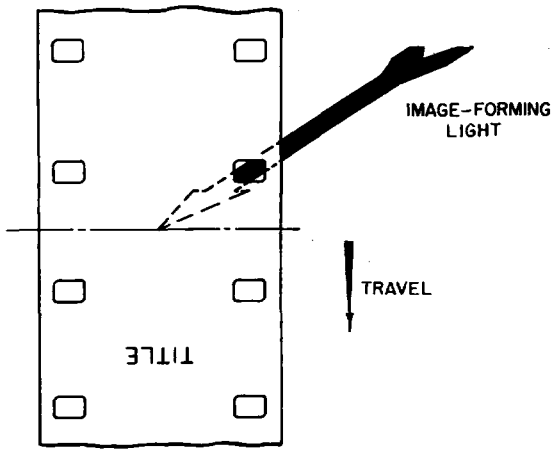
Ph22.9 and PH22.10—July 1955
PH22.48 and PH22.101—April 1955
PH22.88—March 1955
PH22.97—May 1955

All but two standards, PH22.9 and PH22.48, have been modified since their trial publication. However, in all instances these modifications were editorial in nature, consisting of diagram changes, tabulation of dimensions, addition of scope and numbered formal specifications, change in title or some combination of these.—*Henry Kogel*, Staff Engineer

AMERICAN STANDARD

16mm Film Perforated Along Two Edges, Usage in Camera

ASA
Reg. U.S. Pat. Office
PH22.9-1956
(Revision of Z22.9-1946)
UDC 778.534:771.531.3



Drawing shows film as seen from inside the camera looking toward the camera lens.

1. Position of the Emulsion

1.1 Except for special processes, the emulsion shall be toward the camera lens.

2. Rate of Exposure

2.1 The normal rate of exposure shall be 16 frames per second.

APPENDIX

(This Appendix is not a part of the Standard.)

Section 2.1 giving the normal rate of exposure as 16 frames per second is in apparent contradiction with Section 2.1 of PH22.10 which specifies a normal projection rate of 18 frames per second. In modern 16mm practice, however, 16mm film perforated along two edges is used primarily in the amateur field; cameras designed for the amateur are usually spring wound, portable, and not closely governed in taking speed. Variations from 18-14 frames per second at least are commonly observed. It is not customary to design amateur projectors which will reproduce exactly the taking speed and as a matter of fact it has been found that for amateur cinematography this exact speed reproduction is not necessary. Projection at 18 frames does not detract objectionably from films exposed at 16 frames or even at 14 frames and it has the advantages discussed in PH22.10-1956, 16mm Film Perforated Along Two Edges, Usage in Projector.

Therefore, the camera speed of 16 frames per second is regarded as an aim to which considerable tolerances will normally apply. Pictures taken in cameras having this speed tolerance, as well as pictures taken in cameras having constant-speed motors governed at 16 frames per second, will show some change in the velocity of movements when projected at 18 frames per second, but this is not considered objectionable.

Approved April 24, 1956, by the American Standards Association, Incorporated
Sponsor: Society of Motion Picture and Television Engineers

*Universal Decimal Classification

Printed in U.S.A.
ASA:M656

Price, 25 Cents

AMERICAN STANDARD

16mm Film Perforated Along Two Edges, Usage in Projector

ASA
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PH22.10-1956
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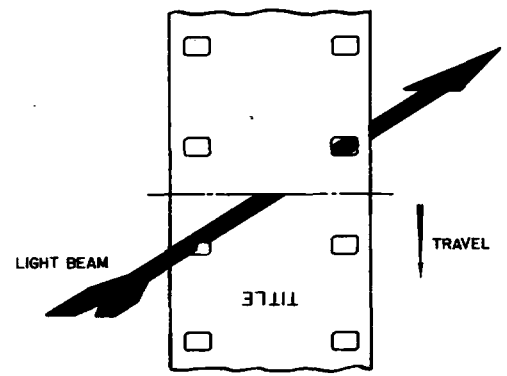

Drawing shows film as seen from the light-source in the projector.

1. Position of the Emulsion

1.1 Except for special processes, the emulsion shall be toward the projection lens. This applies to direct projection on a reflecting screen. If a translucent screen is used, or if the image is reversed left for right by other optical features, the film can be turned around so that the emulsion is toward the projection lamp.

2. Rate of Projection

2.1 The rate of projection shall be 18 frames per second.

NOTE: In projectors having a fixed rate of projection, the projection rate shall be 18 frames per second with a tolerance appropriate for the use to which the projection at this rate is to be put. Projectors having manually adjustable speed shall be capable of reaching a projection rate of at least 18 frames per second.

APPENDIX

(This Appendix is not a part of the Standard.)

In modern 16mm projection practice the use of film perforated along two edges is primarily confined to the amateur field. This equipment is usually portable, the available screen sizes are frequently limited with many common screens small in size and of high gain, and many of the projectors have a high light output. Under these conditions it has been observed that frequently very high screen brightnesses are obtained and that the audience is usually aware of flicker before they are aware of changes in the pictorial quality of the projected pictures. It has been industry practice, therefore, to extend the flicker threshold by choosing as high a projection rate (and, therefore, as high a flicker frequency) as is practicable. A projection rate of 18 frames per second and a corresponding flicker frequency of 54 cycles per second (obtained with a 3-blade shutter) has been found by experience to be an acceptable compromise.

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