Appendix

(The appendix is not a part of this SMPTE Recommended Practice, but is included for information only.)

A1. Test films specified by this practice could be made in many variations: triacetate or polyester base, full- or stripe-coating, and combinations thereof. Use of test material with substantial physical differences from other material to be run can lead to high-frequency errors.

A2. The difference in compliance between triacetate and polyester bases will establish different head wear patterns as film is run. A change from one base to the other may cause a temporary loss of high-frequency response until a new wear pattern is established. Therefore, it is recommended that users employ test films having the same film base as that used for the release prints to be run.

A3. SMPTE Recommended Practice RP 45-1982 (R1982), Use and Care of Sound Test Films, specifies precautions on this subject. Methods of using this film are found in Proposed SMPTE Engineering Guideline EG 13, Use of Audio Magnetic Test Films.

A4. The use of an electrical circuit analogy is provided as a useful method of notation only. Each specified *RC* circuit should be considered separately, without interaction, and the numerical effect added.

A5. Note that release prints are not supplied wound according to the convention in Proposed SMPTE Engineering Guideline EG 12 on Control of Basic Parameters in the Manufacture of SMPTE Photographic and Magnetic Audio Test Films, so the test film is pulled from the supply reel of a conventional projector clockwise, rather than the more common release-print convention of counter-clockwise winding.

A6. This document calls for 3180 μs low-frequency equalization. Equalization with no low-frequency record boost (a time constant of infinity) has been shown to better use the overload characteristic vs. frequency of the magnetic medium when recording typical program material. However, there is some theater equipment in the field which reproduces a flat response only when low-frequency record boost has been applied to recorded material. The use of the 3180 μs time constant is seen as a transitional compromise between the best practice that can be obtained currently and the desired future practice with an infinity time constant. In addition, some older prints may exist which were recorded to a 1590 μs time constant which must, on occasion, be accommodated.

Cinematography — Projector usage of 16 mm motion-picture films for direct front projection — Specifications

1 Scope and field of application

This International Standard specifies the emulsion orientation, the rate of projection, the position of the projected image area and the relationship between picture and sound in the projector, intended for direct front projection of 16 mm motion-picture films with photographic and magnetic sound records, and 16 mm silent motion-picture films.

2 References

ISO 490, *Cinematography — Magnetic stripes and magnetic recording head gaps for sound record on* 16 mm *motion-picture film perforated along one edge (type 1) — Positions and width dimensions.*

ISO 4243, *Cinematography — Picture image area and photographic sound record on* 16 mm *motion-picture release prints — Positions and dimensions.*

3 Emulsion orientation

For 16 mm film the emulsion position is dependent on the process of preparation, and either emulsion-to-light source or emulsion-to-objective lens orientation may be encountered. The actual emulsion position should be indicated by a clear statement or diagram on the leader and on the label of the film container.

4 Rate of projection

The rate of projection shall be $16\ ^{+\ 2.0}_{-\ 2.5}$ and/or 18 ± 1 frames per second for silent motion-picture films and 24 ± 1 frames per second for sound motion-picture films.

NOTES

1 Silent projectors having manually adjustable speed should be capable of reaching projection rates of 16 and 18 frames per second.

2 When a sound film is used in television in areas where the mains electricity supply is a.c. at 50 Hz, a rate of projection of 25 frames per second applies.

5 Position of projected image area

The projected image area shall be located in the vertical direction so that the horizontal axis of the projected area passes through the middle of the distance between the film perforations, as shown in the figure (dimension *A*).

It is recommended that projectors be provided with a framing adjustment of 0,5 mm (0.020 in) minimum above and below the nominal position.

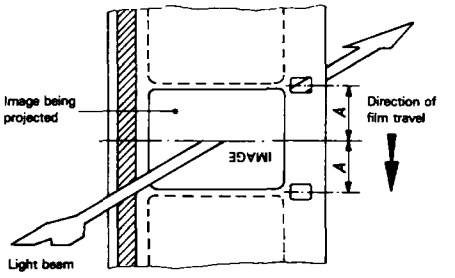
6 Relationship between picture and sound record in the projector

The sound record as located in the film path of the projector shall precede the centre of the corresponding picture by the distances specified in ISO 490 and ISO 4243.

NOTES

1 Picture/sound displacement for prints with photographic sound is specified in ISO 4243 as 26 ± 1 frame, and preferably 26 ± 0,5 frames.

2 Picture/sound displacement for prints with magnetic sound is specified in ISO 490 as 28 ± 1 frame and preferably 28 ± 0.5 frames



The film is shown as seen from the light source in the projector looking towards the projector lens.

Figure

Annex

Applications

(This annex does not form part of the standard.)

The rate of projection, 24 frames per second (see clause 4), is primarily intended for professional application of 16 mm sound motion-picture prints. For non-professional applications, films may be shot at the rate of 16 to 18 frames per second, magnetically striped and a magnetic sound record added.