

## Future of SMPTE

As Engineering Vice-President, Zavada is in a position to evaluate the present status of the Society as an engineering organization and to predict its future. "SMPTE is expanding its effectiveness," he said, "as a result of successful engineering applications in areas related to but far beyond motion picture technology." Zavada described the Society as "truly an image technology organization."

"Our expertise and force," Zavada noted, "lies in the fact that we are the only organization that represents the moving image, audio-visual, industrial, educational, documentary and entertainment industry in all its applications—from the scene through to the presentation of the image. We also assist broadcasters in studio operation from the production of the tape or film to the delivery of the signal to the antenna."

Zavada sees the Society's future of increasing importance and rapid expansion. "Our Society grows as technology evolves," he said. "We are in an area of increasing need for production . . . for imagery of various sorts (usually accompanied by some form of audio), including program-related

graphics and the accompanying data. The structure of the engineering effort of the Society is such that it can respond quickly and effectively to new developments. The Society's newly established study groups examine in depth the new technologies as they appear. Previously we were in a document mode of engineering, attempting to relate to established technology. But now, in the study mode, we can begin to probe in the early stages of the development of a new technology without violating any laws or regulations. As the technique develops or matures into commercial production, we are better prepared to formalize the document-writing procedure by changing from the study group to the working group."

## Other Interests

Zavada's interests other than his work for Eastman Kodak and the SMPTE include flying. "Flying has been a love," Zavada said, "since I was a boy building model airplanes . . . and my father was building a real one. And flying is still my principal non-work activity." Zavada now owns a 1946 Globe Swift, his fourth airplane, and



Roland Zavada speaking before the SMPTE Board of Governors in New York City.

he is part owner of a small airport in Palmyra, N.Y. He spoke affectionately of the P47. He said that it was one of the classic planes for military use, but after the scrap drives of the late 1940s, few, if any, were preserved, as the planes were purchased only for metal at that time. "It's a shame! It's a beautiful plane," Zavada said.

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# STANDARDS AND RECOMMENDED PRACTICES

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## Approved SMPTE Recommended Practices

Three SMPTE Recommended Practices were approved by the Society's Board of Governors on February 5, 1981: RP 91-1981, Specifications for 70-mm Projector Alignment and Screen Image Quality Test Film; RP 97-1981, Specifications for Flutter Test Film for 35-mm Sound Reproducers, Photographic-Type; and RP 98-1981, Measurement of Screen Luminance in Theaters. SMPTE Recommended Practices are available from Society Headquarters for \$1.50 each.

## Proposed SMPTE Recommended Practices

Two Proposed SMPTE Recommended Practices are published here for a trial period and public review: RP 108, Vertical Interval Time and Control Code for Video Tape for 525-Line/60-Field Television Systems; and RP 109, Spectral Response of Photographic Sound Reproducers for 8-mm Type S Motion-Picture Film. Comments should be addressed to Alex E. Alden, Manager of Engineering Services, at Society Headquarters prior to No-

ember 1, 1981. If no adverse criticism is received, the proposal 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 1223-1981, Cinematography — Picture Areas for Motion-Picture Films and Slides for Television — Position and Dimensions, is in agreement with American National Standards PH22.94-1973, PH22.95-1963 and PH22.96-1963 and SMPTE Recommended Practice RP 27.3-1972.

This material is reproduced with permission from the ISO and is copyrighted by the American National Standards Institute, 1430 Broadway, New York, NY 10018, from which complete copies are available. — Alex E. Alden, Manager of Engineering Services.

# SMPTE RECOMMENDED PRACTICE RP 91-1981



## Specifications for 70-mm Projector Alignment and Screen Image Quality Test Film

### 1. Scope

- 1.1 This practice specifies a test film for quantitative measurements of 70-mm projector alignment and screen image quality.
- 1.2 This practice also describes the artwork and dimensions for a test chart to be used as the original subject for the manufacture of a master negative.

### 2. Test Pattern

- 2.1 A reproduction of the test chart is shown in Fig. 1.
- 2.2 The positive resolution charts are modified NBS Resolution Test Charts with a luminance ratio of 100:1 which have been enlarged (see Fig. 3) to provide greater visual clarity on the screen image.

- 2.3 The area between the logos SMPTE and RP 91 is to be used to insert a gray patch, if necessary, as a densitometric control in the exposure and processing of the original negative and subsequent prints.
- 2.4 The test film shall be produced as a 70-mm print in two sections which shall be spliced together for normal use, or as a separate black and white print.

- 2.4.1 The first section of the double test film shall be a print on a black and white silver image film in order to provide a high-contrast, neutral target at normal contrast. The print is acceptable on film manufactured in accordance with American National Standard Dimensions for 70 mm Motion Picture Film Perforated 65mm, KS-1870, ANSI PH22 (19/1981). This section is also available separately.

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- 2.4.1.1 The printing shall be chosen so that, after processing, there is cancellation of the image spread in the resolution targets specified in Sec. 2.2 at 80 lines per millimeter. If used, the gray patch density will provide a convenient densitometric control in the exposure and processing after the characteristics of the system have been established.

- 2.4.1.2 The second section of the test film shall be a print on color positive motion picture film with the image restricted to the top layer for maximum resolution. The print shall be on stock slit and perforated in accordance with ANSI PH22 (19/1981).

- 2.4.1.3 The method of printing shall be chosen to produce less than 0.20 percent (arbitrary) vertical image misregistration on the test print.

### 3. Dimensions

- 3.1 The dimensions of the original test chart shall be 25X the dimensions given in the table. This requirement is necessary because the NBS Resolution Test Charts are designed for a 25X reduction. For practical purposes, a smaller original chart can be prepared provided that the NBS Resolution Charts can be accurately reduced in size by a known ratio which shall then apply to all the other dimensions on the test chart.

- 3.2 The modified NBS Resolution Test Charts shall be placed on the original test chart as specified by the dimensions in Fig. 2.

- 3.3 The densitometric control area specified in Sec. 2.3 shall be not less than 5.0 X 5.0 mm on the 70-mm film.

- 3.4 The gray patches, along with the SMPTE logo, should be placed midway between the horizontal centerline and the top and bottom of the test chart.

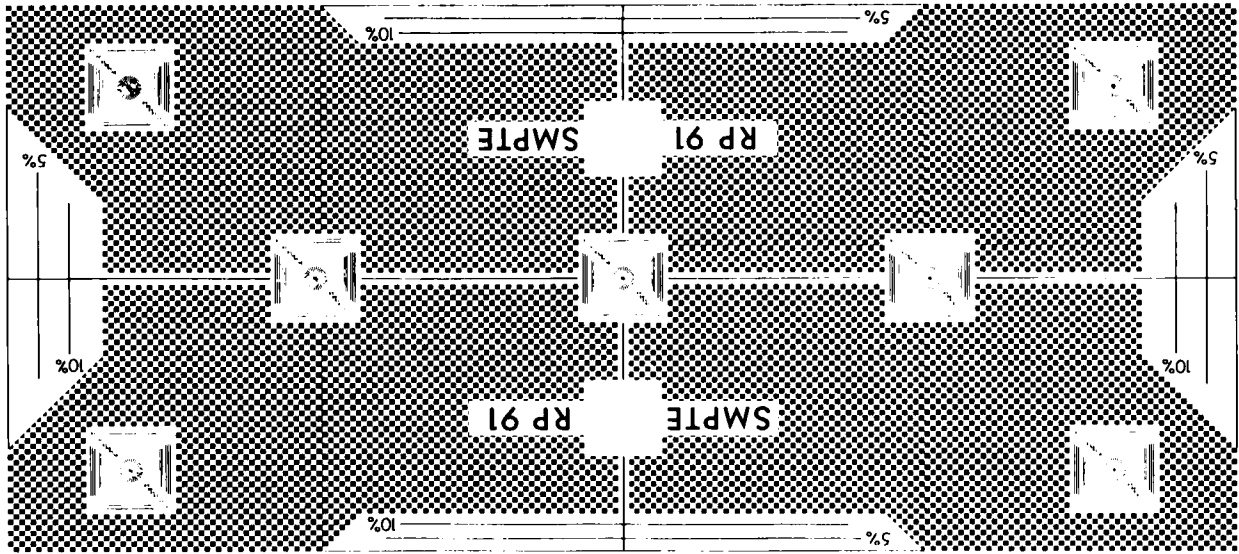


Fig. 1  
Reproduction of Test Chart

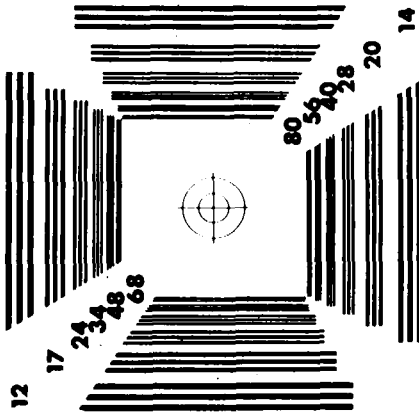


Fig. 3

NOTE: Test films made in accordance with this practice are available from the Society of Motion Picture and Television Engineers.

3.5 The checkerboard background shall contain 100 squares vertically and 220 squares horizontally.

3.6 The length of the lines representing 5 and 10 percent reductions in the projected image width and height are not critical. The clear areas surrounding the lines should be sufficient to allow for the numerical identification.

3.7 The dimensions in the table shall be within tolerances of 0.001 in (0.025 mm) on the print.

Dimensions	Inches*	Millimeters*
A	0.130	3.30
B	0.191	4.85
C	0.378	9.60
D	0.0178	0.452
E	0.0956	2.428
F	0.143	3.63
G	0.0632	1.606
H	0.0131	0.333
J	0.0217	0.551
K	1.912	48.56
L	0.870	22.00
θ	15°	

\*See Sec. 3.7 for tolerances.

Appendix

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

Control of Resolution and Definition in the Preparation of Test Prints

A1. It has been found that producing test prints with resolution at 80 lines per millimeter requires careful selection of the materials and equipment used, and careful control of the operations. Inasmuch as a measuring tool should be better than the system it is designed to measure, it is desirable that the test film meet the specifications detailed herein.

A2. The background checkerboard pattern provides for a 50 percent transmission of the incident radiant energy so as to be more nearly consistent with the projection performance of an average release print.

A3. Image densities referred to in this Appendix are intended for a more precise definition of one system shown to be applicable, and are measured in accordance with American National Standard Conditions for Diffuse and Doubly Diffuse Transmission Measurements (Transmission Density). ANSI PH2.19-1976. Selection of a film for producing the negative must take into consideration image spread characteristics such that, in conjunction with the print films at image densities that are useful, there is

substantial image spread cancellation in the resolution range of interest. Accordingly, the final print will resolve 80 lines per millimeter with the lines and spaces equal in width.

A4. Selection of a film for producing the black-and-white print must take into consideration not only the requirements of Sec. 2.4.1 but also the image spread characteristics compatible with the negative and projection characteristics suitable for theatrical projection.

A5. Selection of a film for producing the dye-image print must take into consideration not only the requirements of Sec. 2.4.2 but also image spread characteristics compatible with the negative and projection characteristics suitable for theatrical projection.

A6. Preparation of the test prints with a resolution and steadiness adequate for the film's purpose requires great care in the selection and operation of the printer. Satisfactory results can be obtained only with a step-contact printer employing registration pins.

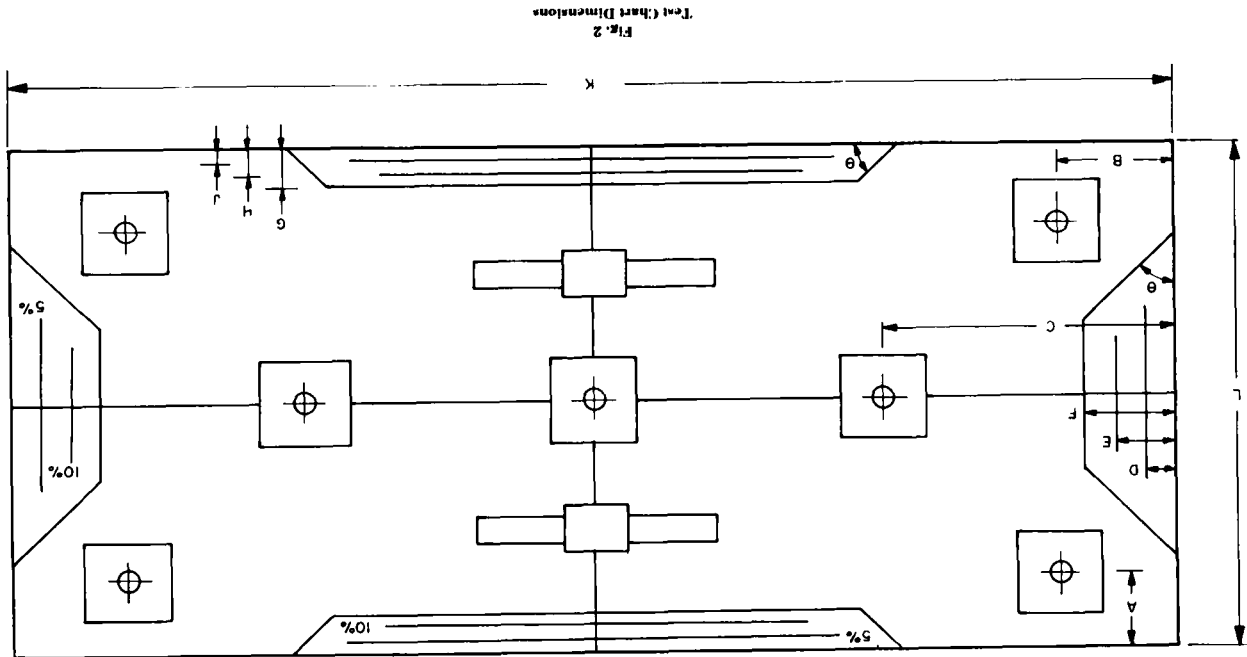


Fig. 2 Test Chart Dimensions

**SMPTE RECOMMENDED PRACTICE**

**RP 97-1981**

*Specifications for Flutter Test Film for  
35-mm Sound Reproducers, Photographic-Type*



**1. Scope**

This practice specifies a test film for determining the presence of flutter in 35-mm motion-picture photographic sound reproducers operating at 90 ft (27.4 m) per minute.

**2. Test Film Signal**

**2.1 Frequency.** The sound record on the film shall reproduce at a frequency of  $3150 \pm 25$  Hz when the linear velocity of the film is 96 perforations per second or approximately 90 ft per minute (18 in or 15.7 cm per second).

**2.2 Location and Dimensions.** The location and dimensions of the recorded sound record shall be in accordance with American National Standard Position, Dimensions and Reproducing Speed of Photographic Sound Records on 35-mm Motion-Picture Release Prints, ANSI PH22-10-1978.

**2.3 Recording.** The test film shall have an originally recorded, variable-area sound track. The modulation of the recording shall be  $80 \pm 5$  percent. The output level of the film shall be constant within  $\pm 0.25$  dB. This is equivalent to an amplitude tolerance of  $\pm 0.0015$  in (0.038 mm) when recording variable-area sound records with a nominal amplitude of 0.025 in (1.40 mm).

**2.4 Flutter.** The weighted peak flutter of the sound record shall not exceed  $\pm 0.01$  percent when

measured in accordance with American National Standard Method of Measurement of Weighted Peak Flutter of Sound Recording and Reproducing Equipment, ANSI/IEEE Std 193-1971.

**2.5 Azimuth.** The azimuth of the sound record shall be  $90^\circ \pm 5^\circ$  to the reference edge of the film.

**3. Film Stock**

The film stock shall be splice-free safety type in compliance with American National Standard Specifications for Motion-Picture Safety Film, ANSI PH22-31-1980, and cut and perforated in accordance with long-pitch dimensions specified in American National Standard Dimensions for 35-mm Motion-Picture Film Perforated KS, ANSI PH22-139-1980.

**1. Identification**

Each test film shall be identified by a suitable identification marking. The marking shall be printed lengthwise in the picture area and the spacing between consecutive titles shall be approximately 12 in (305 mm).

**NOTE:** A test film conforming to this practice is available from the Society of Motion Picture and Television Engineers.

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**SMPTE RECOMMENDED PRACTICE**

**RP 98-1981**

*Measurement of Screen Luminance in Theaters*



**1. Scope**

This practice specifies the procedure for measuring screen luminance in theaters in order to produce good pictorial quality for the maximum number of patrons. Screen luminance and viewing conditions for projection of motion-picture prints are specified in American National Standard Screen Luminance and Viewing Conditions for Indoor Theater Projection of Motion-Picture Prints, ANSI PH22-196-1978.

**2. Measurement Conditions**

Projector operating conditions, photometer type, luminance level, spectral distribution, color temperature, stray light, and flicker shall be as specified in ANSI PH22-196-1978.

**3. Photometer Locations in the Theater**

**3.1** Screen luminance shall be measured from a position in the center of the seating area, as specified in ANSI PH22-196-1978.

**3.2** For typical matte white screens, one reading taken from the center of the audience area shall be adequate.

**3.3** For gain screens (lenticular, retroflective, or semi-specular), more readings are necessary to ensure that the screen is properly installed. The photometer readings shall be taken at eye level (one meter above the floor) from the center and each end of the middle row of seats. (See SMPTE Recommended Practices on Gain Determination of Front Projection Screens, RP 91-1980; and Installation of Gain Screens, RP 95-1980.)

**Appendix**

The Appendix is not a part of this SMPTE Recommended Practice, but is included for information purposes only.

**A1.** The use of gain screens can raise luminance levels for most of the audience and, at the same time, save energy. It should be pointed out, however, that with gain screens, the luminance as seen from front and side seats may not meet the level and distribution specified in ANSI PH22-196-1978. This lower luminance may be advantageous for the front seats because flicker can be objectionable in peripheral vision which is a factor for patrons seated very close to the screen.

**A2.** The rear seats in theaters without balconies normally will be within the luminance values obtained in the three readings in the center row, but more readings can be taken, if necessary, to properly curve and tilt a gain screen to obtain good pictorial quality for the maximum number of theater patrons.

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