

SMPTE RECOMMENDED PRACTICE RP 27.4-1985

Specifications for Operational Test Pattern for Checking Jitter, Weave and Travel Ghost in Television Projectors



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1. Scope

This practice specifies the format, dimensions and optical densities for a test pattern transparency to be used as an operational tool for measurement of television film projector image stability.

2. Purpose

2.1 This practice specifies a test film to facilitate day-to-day operational checking of travel ghost, weave, and jitter in 35-mm and 16-mm television projectors.

2.1.1 Jitter Steps. The steps at the top and bottom of the pattern are used for measuring picture jitter vertically.

2.1.2 Weave Steps. The steps at the right and left of the pattern are used for measuring picture weave horizontally.

2.1.3 Central Window. The central window or rectangular area in the center of the pattern shall

be used for measurement of jitter and weave with a grating pattern or a line selector on an oscilloscope.

3. Format

3.1 Pattern. A reproduction of the test pattern is shown in Fig. 1.

3.2 Window Configuration. The windows shall be staggered so that any trailing or travel ghosts due to the projector shutter opening early or late can be seen above or below the windows.

3.3 Pattern Identification. The identification number of this document shall appear on the projected image in the area specified in the figures.

4. Dimensions

4.1 Test Pattern. The dimensions of the test pattern shall be as shown in Fig. 2 and the table in percentage of frame height and reproduced with a tolerance of ± 2 percent of the frame height.

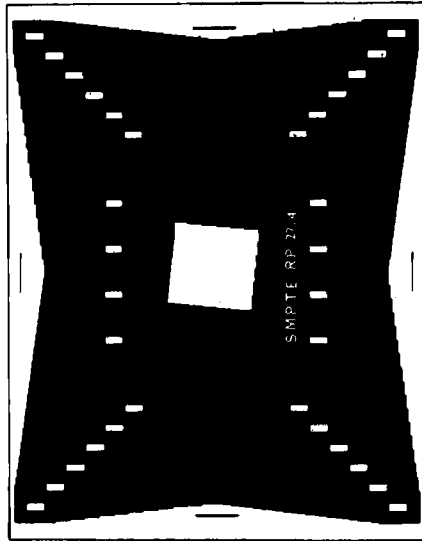


Fig. 1
Reproduction of Test Pattern

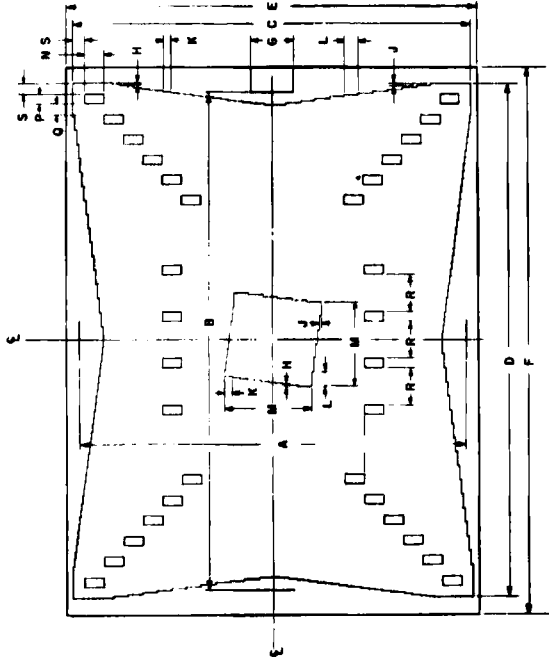


Fig. 2
Dimensional Drawing of Test Pattern

Dimensions	Percent	Inches		Millimeters	
		35-mm	16-mm	35-mm	16-mm
A Scanned area height	100.00	0.594	0.276	15.09	7.01
B Scanned area width	133.3333	0.792	0.368	20.12	9.35
C Television projector image height		0.612	0.285	15.54	7.24
D Television projector image width		0.816	0.380	20.73	9.65
E Camera image height		0.681	0.285	16.03	7.49
F Camera image width		0.868	0.404	22.05	10.26
G Line length	11.25	0.067	0.031	1.70	0.79
H Half-step width	0.25	0.0015	0.0007	0.038	0.018
J Full-step width	0.50	0.003	0.0014	0.08	0.036
K Half-step length	1.875	0.011	0.005	0.28	0.13
L Full-step length	3.75	0.022	0.010	0.56	0.25
M Central window height and width	22.50	0.134	0.062	3.40	1.57
N Window height	5.00	0.030	0.014	0.76	0.36
P Window width	2.50	0.015	0.007	0.38	0.18
Q Window spacing in diagonal row	3.00	0.018	0.008	0.46	0.20
R Window spacing in horizontal row	10.00	0.059	0.028	1.50	0.71
S Location of corner windows	3.00	0.018	0.008	0.46	0.20

4.1.1 Tolerances. The camera shall be capable of producing an image positioned in relation to the perforations within ± 0.025 percent of picture height for 35-mm and ± 0.05 percent of picture height for 16-mm film.

4.2 Test Film. The test film shall be a camera original film photographed on high-definition, positive motion-picture stock made in accordance with American National Standard Dimensions for 35-mm Motion-Picture Film Perforated K5, ANSI PH22.139-1980, and American National Standard Dimensions for 16-mm Motion-Picture Film Perforated 2R, ANSI PH22.110-1980.

4.2.1 The camera shall be capable of producing an image in accordance with style A dimensions specified in American National Standard Dimensions of 35-mm Motion-Picture Camera Aperture Images, ANSI PH22.59-1974 (R1981), and American National Standard for Motion-Picture Film (16-mm) — Camera Aperture Image, ANSI PH22.7-1983.

4.3 Projected and Transmitted Areas. The projected image area is represented by the outside dimensions of the jitter and weave steps. The television transmitted area is represented by the lines inside the jitter and weave steps. The areas shall be in

accordance with American National Standard for Motion-Picture Film (35-mm)—Television Image Area, ANSI PH22.93-1984, and American National Standard Dimensions for Television Image Area on 16-mm Motion-Picture Film, ANSI PH22.96-1982.

5. Optical Densities

5.1 Optical Densities. All optical densities shall be measured in accordance with American National Standard Conditions for Diffuse and Doubly Diffuse Transmission Measurements (Transmission Density), ANSI/ASC PH2.19-1976 (R1983).

5.2 Background. The background shall have a density greater than 1.4.

5.3 Windows and Surround Area. The density of the windows and surround area shall be between 0.3 and 0.4.

Note 1: The emulsion position shall correspond to the one normally used for the specific format.

Note 2: Test material conforming to this practice is available from the Society of Motion Picture and Television Engineers.

SMPTÉ RECOMMENDED PRACTICE

Density of Color Prints and Slides for Television

RP 46-1985



Introduction

In May 1961, the Joint Subcommittee of the Color and Television Engineering Committees of the SMPTÉ issued a report entitled "Considerations in Color Film Production for Color Television" as an appendix for a future recommended practice for contrast and density range of color films for color television. The report, which is considered to be a part of this recommended practice and which is included as an appendix, emphasizes careful control of the original photography, including such items as lighting and stage practice recommendations. The significance of the densities specified in this practice should be considered with regard to the factors discussed in the appendix, particularly the last two paragraphs.

In March 1966, Issue No. 2 of the SMPTÉ Color Reference Film was released for sale. This issue and Issue No. 3 (released in July 1967) closely followed the recommendations in the initial article. Successful telecasting of prints of these issues as well as other commercial material conforming to the initial recommendation has led to the following specifications regarding density levels for color prints which reproduce well on a color or black-and-white television system.

In its 15th plenary assembly in Geneva, 1982, the International Radio Consultative Committee included recommendations for density requirements for color films for television as part of its Recommendation 265-4. Standards for the International Exchange of Monochrome and Colour-Television Programmes on Film. Since the CGIR recommendation has been internationally accepted, this practice is designed to follow it as much as possible.

1. Scope

This practice specifies important density values of color 16-mm and 35-mm motion-picture prints and slides intended for television transmission, but which must also produce high-quality projected images.

2. Density Requirements

2.1 The method of density measurement shall be in accordance with American National Standard

Conditions for Diffuse and Doubly Diffuse Transmission Measurements (Transmission Density), ANSI PH2.19-1976 (R1983). The spectral quality of the densitometer should conform to American National Standard for Photography (Sensitometry)—Density Measurements—Spectral Conditions, ANSI/ISO 5/3-1984, ANSI PH2.18-1985, for visual density.

2.2 The density corresponding to television white level should be 0.2 to 0.4 (see Note 2). This value is not intended to apply to specular highlights and other small areas where details need not be reproduced, and is dependent on the particular film system characteristics.

2.3 The maximum density of a film is determined by the scene contrast and the film transfer characteristic. Shadow areas, in which significant pictorial details are not present and in which the reproduction of detail is not essential to the picture, may have densities in the range of 2.0 to 2.5, but it must be recognized that, in such areas, both image gradation and color may be distorted or lost entirely. The density range for optimum reproduction is expected to be between 0.5 and 1.7.

2.4 For films intended for direct projection, minimum densities depend upon the gray-scale characteristics of the film system used.

Notes

1. This practice applies primarily to prints.
2. Television white level preferably corresponds to a fully-lit object in the scene having a reflectance of about 60 percent. This results in the reproduction of motion-picture prints with fully-lit human faces which have reflectances of 35 to 15 percent at film densities 0.2 to 0.5 greater than the density corresponding to television white.
3. Although this value appears higher than that recommended for black-and-white films (SMPTÉ Recommended Practice on Density and Contrast Range of Black-and-White Films and Slides for Television, RP 7-1982), it is in effect no higher. Silver-image films scatter light such that the effective density in the television film chain is increased by an average factor of 1.35 over that measured in singly diffused light. For dye images, this light scatter factor (Callier Q) is approximately 1.0.