PROPOSED SMPTE RECOMMENDED PRACTICE RP 18

Test Film for Checking 16mm Motion-Picture Photographic Sound Projectors

1. *Scope*

This Recommended Practice describes a film and method for rapidly checking and demonstrating 16mm motion-picture projection and photographic sound performance. The film is suitable for use by projector manufacturers, service stations, educational organizations and camera stores. No test instruments are required.

2. *Test Film*

2.1 The film shall have a photographic sound record and accompanying picture. The sound record dimensions shall comply with American Standard Sound Record on 16mm Prints, PH22.41-1957, and the film stock used shall be cut and perforated in accordance with American Standard Dimensions for 16mm Film, Perforated One Edge, PH22.12-1953.

2.2 The test film shall contain sections selected by a special Engineering Committee of the Society of Motion Picture and Television Engineers to test for the following:

Sound Samples

1. Faithful reproduction of wide-range music
2. Clarity of tone—piano
3. Correct sound track guiding—buzz track
4. Normal volume level
5. Compromise sound focus
6. Frequency response from 50 to 5,000 cycles
7. Dialogue intelligibility

Picture Samples

1. General picture steadiness
2. Uniform aperture brightness
3. General picture quality

2.3 Each film shall be provided with a head and tail leader. The main title shall include the issue number of the film so that revised versions may be easily identified. Subtitles superimposed over each section shall indicate the particular projector sound and/or picture characteristic to be tested by that portion of the film.

2.4 Each film shall be accompanied by an instruction sheet indicating the procedure to be used in checking and demonstrating 16mm projection equipment.

2.5 The length of the film shall be approximately 135 feet.

2.6 Each film shall be wound on a reel and packed in a taped can.

3. *Method of Use*

3.1 With the projector set up for projection of a sound picture print and the loudspeaker(s) properly located in accordance with the instruction book furnished with the equipment, proceed as follows:

(a) Set tone control(s) to normal, thread test film into projector and set volume for comfortable loudness. If the sound optics have adjustable focus, adjust the focus to give the most satisfactory audio quality.

(b) Frame and focus picture for best overall screen image.

3.2 As the test sections are projected, observe the following:

(a) Listen for full range of orchestra. Note picture steadiness at top and sides. Note picture sharpness across the entire frame. White streaks on letters indicate travel ghost.

(b) Look for uniform picture brightness. Listen for smooth, even music; quaver indicates flutter.

(c) Silence or equal loudness of the two tones shows correct side-guide adjustment.

(d) Normal volume is established while listening to a 700-cycle tone. Use same gain setting each run.

(e) Three high tones (5,000 cycles) will indicate correct scanning assembly adjustment. Emulsion position is reversed in middle section.

(f) Seven distinct tones are frequencies of 50 to 5,000 cycles. All should reproduce well.

(g) Listen for natural sound of voices.

Note: A test film made in accordance with this Recommended Practice is available from the Society of Motion Picture and Television Engineers. (This film was formerly called "Jiffy" Test Film.)

Proposed American Standards

Two Proposed American Standards and a Recommended Practice are published here for a trial period and public review. Comments should be addressed to Alex E. Alden, Staff Engineer, at Society Headquarters prior to June 15, 1964. If no adverse criticism is received by that date, the proposed standards will be submitted to the ASA Sectional Committee for further processing. The Proposed Recommended Practice, on the other hand, will be submitted directly to the SMPTE Board of Governors for final approval.

Proposed American Standard PH22.144, Dimensions and Optical Specifications of Test Slides and Transparencies for Television, is the first standard of a series describing technical transparencies for television. For several years, a subcommittee of the Society's Television Committee, in cooperation with the Electronic Industries Association, has been updating material such as the well known RETMA Charts, for publication as American Standards. The Committee under the chairmanship of Dr. John H. Ladd has completed this fundamental standard describing the physical aspects of precision black-and-white slides. When approved, this standard will be the basic reference for mechanical dimensions, optical specifications and stability requirements.

Proposed American Standard C98.6, Dimensions of Video, Audio and Tracking Control Records on 2-In. Video Magnetic Tape, specifies the physical placement of the various records and tracks on video magnetic tape. This standard gives the data for the so called Quadruplex system of recording at both the 15 and 7.5 inch per second tape speeds.—*A.E.A.*

Proposed American Standard

Dimensions and Optical Specifications of Test Slides and Transparencies for Television

PH22.144

1. Scope

This standard describes the mechanical dimensions, optical specifications, and stability requirements for 2 x 2 in. and 8 x 10 in. test slides and transparencies for television. Slides for television program use are specified by American Standard Dimensions for Lantern Slides, Z38.7.19-1950, and American Standard Slides and Opaques for Television Film Camera Chains, PH22.94-1954.

2. Purpose

This standard describes all the common features of complete, assembled test transparencies for television. The 2 x 2 in. black-and-white test transparencies are designed for testing film monochrome and color television systems. The 8 x 10 in. black-and-white test transparencies, mounted in an illuminator, are designed for testing live monochrome and color television systems.

3. Dimensions

Each dimension is stated as a directly measurable distance on the complete, assembled test transparency for television. The stated values are rounded in accordance with American Standard Rules for Rounding Off Numerical Values, Z25.1-1940 (Reaffirmed 1961). Fig. 1 shows dimensions and tolerances for a complete, assembled 2 x 2 in. test transparency. Fig. 2 shows the dimensions and tolerances for a complete, assembled 8 x 10 in. test transparency. The figures acknowledge four possible categories of test transparencies shown in Table 1.

Table 1
Test Pattern Categories

Position tolerances for test pattern edges	Border outside test pattern	
	Black-and-white	Black only
Close	Category 1	Category 2
Broad	Category 4	Category 3

4. Optical Specifications

4.1 Optical Densities. All optical densities in this standard are American Standard diffuse densities, and in accordance with American Standard Diffuse Transmission Density, PH2.19-1959. Except for wavelength values, the densities are in accordance with American Standard Spectral Diffuse Densities of Three-Component Subtractive Color Films, PH2.1-1952. Violet, blue, green, yellow, and red densities shall be measured with energy concentrated at the center wavelengths listed in Table 1. Densities may be measured in a practical instrument with any practical condition which is proven by test to yield densities not significantly different from spectral diffuse density at the center wavelength.

Table 2
Wavelength Bands for Abridged Spectrophotometry

Title of band	Wavelength limits in microns	Center wavelength (micron)	Band symbol
violet	.37 to .43	.40	V
blue	.43 to .49	.46	B
green	.49 to .55	.52	G
yellow	.55 to .61	.58	Y
red	.61 to .67	.64	R

4.2 Wavelength Band Symbols. The wavelength band symbol shown in Table 2 shall be printed on each test transparency for each wavelength band for which that transparency is within tolerance in all areas at the densities specified for that transparency. The printing shall be added to the front side of the complete, assembled 2 x 2 in. and 8 x 10 in. test transparency in a position outside the test pattern area and outside the black or black-and-white border area.

4.3 Reference White Areas. All areas within the test pattern area and in the black-and-white border outside the test pattern area of a complete, assembled 2 x 2 in. and 8 x 10 in. test transparency which are intended to be transmitted at reference white level shall have densities of .30 to .40.

4.4 Black Lines and Black Areas. All black lines and black areas within the test pattern area and in the black-and-white border outside the test pattern area of a complete, assembled 2 x 2 in. and 8 x 10 in. test transparency shall have densities of 1.90 or greater.

4.5 Glass Cover. The side (of the test pattern area and border area of a test transparency) facing the projection lens shall be sealed to glass. The side (of the test pattern area and border area) facing the light source shall be sealed either to glass or to film base. The glass must hold the test pattern and border flat, protect the test pattern and border when the transparency is cleaned, prevent out-of-focus drift, and prevent moisture condensation under unusual conditions of heat and humidity. The glass shall be selected for freedom from blemishes, distortions, and surface scratches. The complete, assembled 2 x 2 in. and 8 x 10 in. transparency shall appear clean, and shall be free from dirt, pinholes, blemishes, or surface scratches with width greater than .2 percent of test pattern height.

4.6 Interference Patterns. The complete, assembled 2 x 2 in. and 8 x 10 in. test transparency shall show no visible interference patterns, such as Newton's rings. The complete, assembled test transparency shall be free from air spaces which may create interference patterns.

5. Stability

The complete, assembled test transparency shall remain within mechanical and optical tolerances (when measured at 75 ± 3 degrees Fahrenheit and 50 percent ± 5 percent relative humidity) in spite of the mechanical shocks, temperature and humidity variations, and fading conditions which may normally be expected to occur within one year of storage, shipping, and service.

NOTE: Test pattern categories 1 and 2 have position tolerances of about ±.1 percent for the test pattern edges. Hence, test patterns of categories 1 and 2 are likely to be manufactured from photographic plates, rather than from film. Photographic film on cellulose triacetate base may have a long-time aging shrinkage of .30 percent to .35 percent (one year at 78 F, 60 percent relative humidity).

6. Bibliographical References

American Standard Diffuse Transmission Density, PH2.19-1959

American Standard Dimensions for Lantern Slides, Z38.7.19-1950

American Standard Slides and Opaques for Television Film Camera Chains, PH22.94-1954 (Supplement to Z38.8.19-1950)

American Standard Spectral Diffuse Densities of Three-Component Subtractive Color Films, PH2.1-1952

American Standard Drafting Manual, Section 5, Dimensioning and Notes, Y14.5-1957

American Standard Rules for Rounding Off Numerical Values, Z25.1-1940 (Reaffirmed 1961)

American Standard Definitions of Electrical Terms, Group 65, Communications, C42.65-1957

American Standard Method of Measurement of Television Luminance Signal Levels, C16.31-1959

American Standard Dimensions for Photographic Dry Plates (Inch and Centimeter Sizes), PH1.23-1959

SMPTE Recommended Practice RP 7, Density and Contrast Range of Black-and-White Films and Slides for Television, Society of Motion Picture and Television Engineers

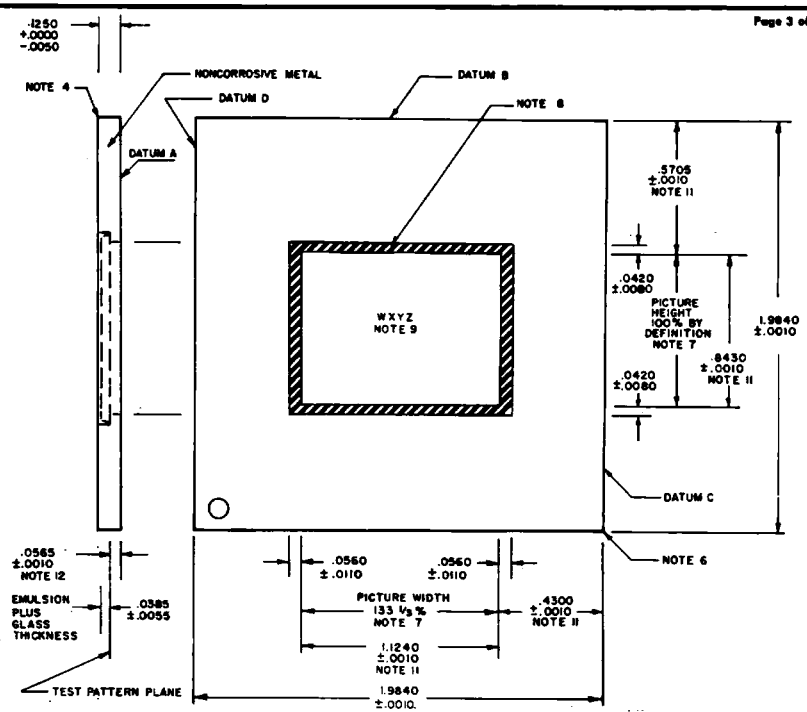

Fig. 1. Dimensions of 2 x 2 in. Test Transparency for Television.

NOTES:

1. All dimensions in inches.
2. Datum surfaces B, C and D to be perpendicular to datum surface A within .0010 total.
3. Datum surfaces C and D to be perpendicular to datum surface B within .0020 total.
4. Break eight edges .0150 min radius to .0300 max radius.
5. All datum surfaces to be flat within .0010 total.
6. Radius of .1250 max permitted at four corners.
7. Test pattern area is defined to be the 100% by 133 1/3% area shown.
8. For test pattern categories 1 and 4, border outside test pattern area on test pattern plane to be reference black and reference white (transmitting) diagonal (45°) bars of equal width; 20 cycles per picture width and 15 cycles per picture height. Border to be reference black for test pattern categories 2 and 3.
9. The letters WXYZ show orientation of test pattern content with respect to datum surfaces A, B, C and D.
10. Four ± .0010 position tolerances on test pattern area edges apply only to test pattern categories 1 and 2. For test pattern categories 3 and 4, the four position tolerances are ±.0050.
11. Datum A is toward light source in conventional slide projector and in vidicon slide chain. Glass plate upon which test pattern is supported is in imaging optics.
12. The .0565 dimension from datum A to test pattern plane assumes that average thickness of glass on back of program slide is .028, that average distance from datum A to picture plane on program slide is .0600, and that average refractive index is 1.52 for glass on test slide and on program slide. The difference between .0565 and .0600 compensates for shift in focal plane due to thicker glass on side of test pattern toward projection lens.
13. The planes of datums A, B, C and D are established by high points of the complete, assembled piece.

Table 3
Conversion Table for Fig. 1

Inches	Millimeters
1.9840	50.394
1.1240	28.550
.8430	21.412
.5705	14.491
.4300	10.922
.1250	3.175
.0635	1.613
.0560	1.422
.0420	1.067
.0385	.978
.0300	.762
.0280	.711
.0150	.381
.0110	.279
.0080	.203
.0055	.140
.0050	.127
.0020	.051
.0010	.025

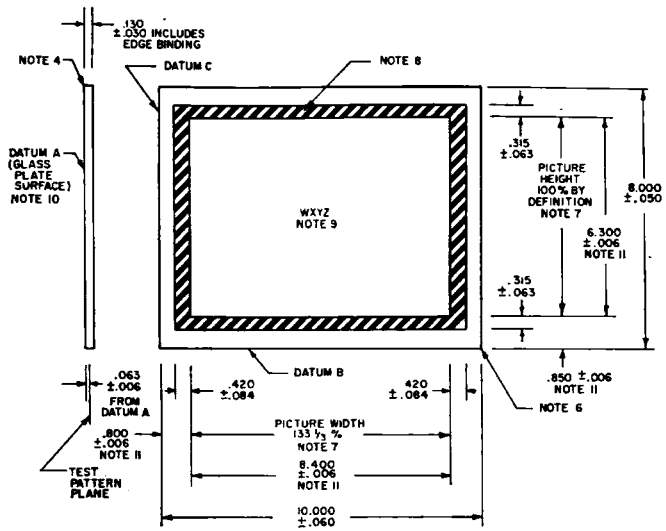

Fig. 2. Dimensions of 8 x 10 in. Test Transparency for Television.

NOTES:

1. All dimensions in inches.
2. Datum surfaces B and C to be perpendicular to datum surface A within .006 total.
3. Datum surface C to be perpendicular to datum surface B within .006 total.
4. Bind or break eight edges .015 min radius to .040 max radius.
5. All datum surfaces to be flat within .006 total.
6. Radius of .130 max permitted at four corners.
7. Test pattern area is defined to be the 100% by 133 1/3% area shown.
8. For test pattern categories 1 and 4, border outside test pattern area on test pattern plane to be reference black and reference white (transmitting) diagonal (45°) bars of equal width; 20 cycles per picture width and 15 cycles per picture height. Border to be reference black for test pattern categories 2 and 3.
9. The letters WXYZ show orientation of test pattern content with respect to datum surfaces A, B and C.
10. Datum A is toward diffuse light source in transparency viewer.
11. Four ±.006 position tolerances on test pattern area edges apply only to test pattern categories 1 and 2. For test pattern categories 3 and 4, the four position tolerances are ±.035.
12. The planes of datums A, B and C are established by high points of the complete, assembled piece.

Table 4
Conversion Table for Fig. 2

Inches	Millimeters
10.000	254.00
8.400	213.36
8.000	203.20
6.300	160.02
.850	21.59
.800	20.32
.420	10.67
.315	8.00
.130	3.30
.084	2.13
.063	1.60
.060	1.52
.050	1.27
.040	1.02
.035	.89
.030	.76
.015	.38
.006	.15

Proposed American Standard

Dimensions of Video, Audio and Tracking Control Records on 2-In. Video Magnetic Tape

C98.6

1. Scope

This standard specifies the locations and dimensions of the video, audio and tracking control records on 2-in. video magnetic tape.

2. Dimensions

The dimensions shall be as specified in the figures and tables.

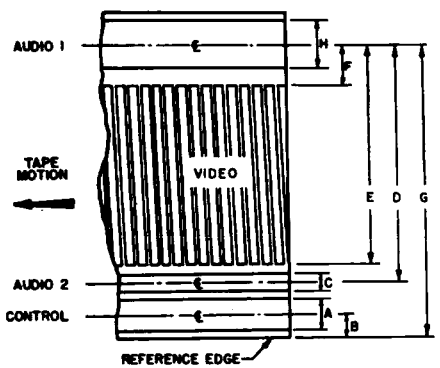

Fig. 1. Position of Records.

Table 1

Dimensions	Inches	Millimeters
A	0.045 ± 0.005	1.14 ± 0.13
B	0.022 ± 0.002	0.56 ± 0.05
C	0.022 ± 0.002	0.56 ± 0.05
D	1.894 ± 0.002	48.11 ± 0.05
E	1.872 $^{+0.005}_{-0.000}$	47.55 $^{+0.13}_{-0.00}$
F	0.057 $^{+0.000}_{-0.005}$	1.45 $^{+0.00}_{-0.13}$
G	1.962 ± 0.004	49.81 ± 0.10
H	0.070 ± 0.004	1.78 ± 0.10

3. Magnetic Coating

With the direction of tape motion as shown in Fig. 1, the magnetic coating is on the surface facing the observer.

4. Video Track Curvature

Each video track shall not devicte from a straight line by more than 0.001 in. (0.03 mm)

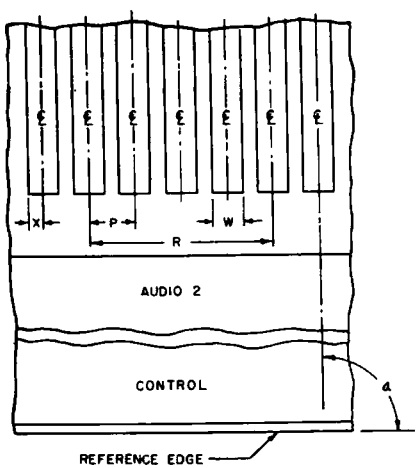

Fig. 2. Detail of Video Tracks.

Table 2
Dimensions of Video Tracks (15 in./sec, 960 tracks/sec)

Dimensions	Inches	Millimeters
P = R/4	Calc	Calc
R	0.0625 ± 0.0010	1.588 ± 0.025
W	0.0100 ± 0.0005	0.254 ± 0.013
X	W/2 ± 0.0002	W/2 ± 0.005
α	90° 33′ ± 3′	

Table 3
Dimensions of Video Tracks (7.5 in./sec, 960 tracks/sec)

Dimensions	Inches	Millimeters
P = R/4	Calc	Calc
R	0.0312 ± 0.0010	0.794 ± 0.025
W	0.0050 ± 0.0005	0.127 ± 0.013
X	W/2 ± 0.0002	W/2 ± 0.005
α	90° 17′ ± 3′	

Appendix

(This Appendix is not a part of Proposed American Standard Dimensions of Video, Audio and Tracking Control Records on 2-In. Video Magnetic Tape, C98.6, but is included to facilitate its use.)

A magnetic record or track is that area in which magnetization conveying the intended signal exists. A common technique for measurement of record locations and dimensions is the use of carbonyl iron to make them visible.