

correcting distortions in the prototype models. These improvements owe much to the computer program devised by Newton of University College, London, which produces ray traces rapidly making design study possible and reducing the number of built in variables considerably.

After a break for tea, the Association held its Annual General Meeting. The Chairman, R. J. North, presented the Committee's report including the unfortunate cancellation of this year's Spring Conference due to various external events. The secretary, J. A. Nunn, is temporarily inactive for private reasons and has been deputized for by C. W. Husbands of the same department at RAE, Farnborough. N. Dombrowski has retired from active Association duties as his interests are now elsewhere and K. R. Coleman is temporarily indisposed follow-

ing a serious operation from which he is now recovering. The Chairman told members that the International Conference of 1972 will be held in Nice, France, from September 25 to 30, 1972 and that it has been proposed to invite the Conference to London in September 1974. The election for committee members followed when three retiring members, D. A. Barnsley, D. H. Pimley and M. B. Prudence were re-elected and C. W. Husbands, the acting secretary was elected.—*George H. Lunn*, 57 Whitelown Rd., Tadley, Basingstoke, Hants., England

References

1. I. D. Chalmers and H. Duffy, "Observations of the arc forming stages of spark breakdown using an image intensifier and converter," *British Jour. of Physics D*, 4: 1302-05, 1971.
2. I. D. Chalmers, "The transient glow discharge in nitrogen and dry air," *British Jour. of Physics D*, 4: 1147-51, 1971.

High-Speed Photography Appointments

President Wilton R. Holm has announced the resignation of D. Max Beard, Silver Spring, Md., as United States Delegate to the International Committee on High-Speed Congresses, due to his retirement from government service. He has been replaced in this assignment by Carlos H. Elmer, Scottsdale, Ariz., formerly SMPTE Vice-President for Photo-Instrumentation Affairs.

To permit concentration on plans for U.S. participation in the 10th International Congress on High-Speed Photography, Mr. Elmer has asked to be relieved from his duties as Vice-President, and A. Earl Quinn, Rochester, N.Y., has been elected to replace him in this post.

Mr. Quinn has coordinated activities of Eastman Kodak Co. in the field of high-



A. Earl Quinn, new Photo-Instrumentation Affairs Vice-President, and Carlos H. Elmer, new United States Delegate to the International Committee on High-Speed Photography Congresses.

speed photography since 1942. His work has included significant studies of steadiness in rotating-prism cameras, and he has

developed a widely-used technique for the measurement of this function.

Max Beard and Carlos Elmer served as Chairmen of the last two International Congresses on High-Speed Photography held in the United States — Mr. Beard the 5th Congress at Washington, D.C., in 1960, and Mr. Elmer the 9th Congress at Denver in 1970. Both have served as Chairman of the Society's Engineering Committee on High-Speed Photography and Instrumentation, a post currently held by Mr. Quinn, and both have been active in applications of photographic instrumentation in weapons research for the U.S. Navy.

The 10th Congress will be held at Nice, France, during the period September 25-30, 1972. Prospective authors are asked to notify the SMPTE at its New York Headquarters so that their names may be added to the list of those to receive announcement forms and registration blanks as they are supplied by the French organizing committee.

standards and recommended practices

SMPTE Recommended Practice Approved

On July 22, 1971, the Society's Board of Governors approved SMPTE Recommended Practice RP 36-1971, Specifications for Positioning Tape Neutral Plane and Adjacent Tape Guides for Quadruplex Video Tape Recorders Operating at 15 in/s and 7.5 in/s. The practice specifies the video recording head geometry necessary to minimize velocity error which has become associated with hue error in video tape recording.

Proposed SMPTE Recommended Practices

Three Proposed SMPTE Recommended Practices are published here for a trial period and public review: RP 27.3,

Specifications for Safe Action and Safe Title Areas Test Pattern for Television Systems; RP 27.4, Specifications for Operational Test Pattern for Checking Jitter, Weave and Travel Ghost in Television Projectors; and RP 27.5, Specifications for Mid-Frequency Response Test Pattern for Television.

They were developed by the Television Committee as part of a series of precision patterns. A subcommittee report describing this work was published in the December 1967 *Journal*.

Comments should be addressed to Alex E. Alden, Staff Engineer, at Society Headquarters prior to January 15, 1972. If no adverse criticism is received by that date, the Proposed Recommended Practices will be submitted to the SMPTE Board of Governors for final approval. — A.E.A.

Specifications for Positioning Tape Neutral Plane and Adjacent Tape Guides for Quadruplex Video Magnetic Tape Recorders Operating at 15 in/s and 75 in/s



Page 1 of 2 pages

1. Scope

This recommended practice defines the position of the tape neutral plane and the guides which determine the tape neutral plane, with respect to the plane of rotation of the pole tips and the axis of rotation of the video head wheel.

2. Definitions

2.1 Tape Input Guide. The last guiding element encountered by the tape as it approaches the vacuum guide.

2.2 Tape Output Guide. The first guiding element encountered by the tape after it leaves the vacuum guide.

2.3 Tape Neutral Plane. A plane located between and defined by the tape input guide and the tape output guide, in which the tape would lie if it were undeflected by the vacuum guide.

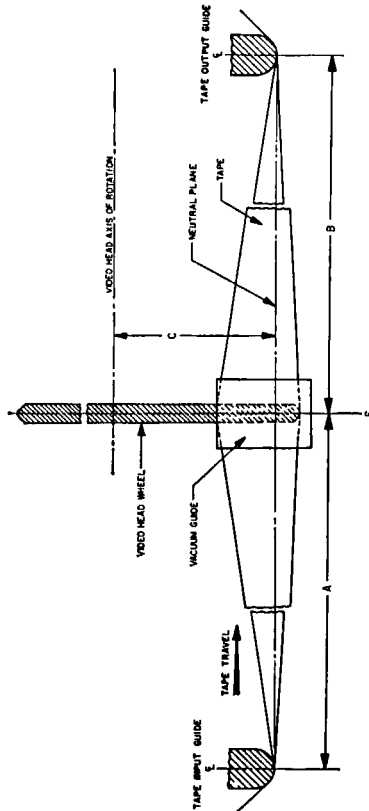


Figure 1
Relative Position of Tape Guides and Head Wheel Assembly

Copyrighted, 1971, by
SOCIETY OF MOTION PICTURE AND TELEVISION ENGINEERS
9 East 41st Street, New York, N.Y. 10017, (212) TN 7-5410

Approved July 1971

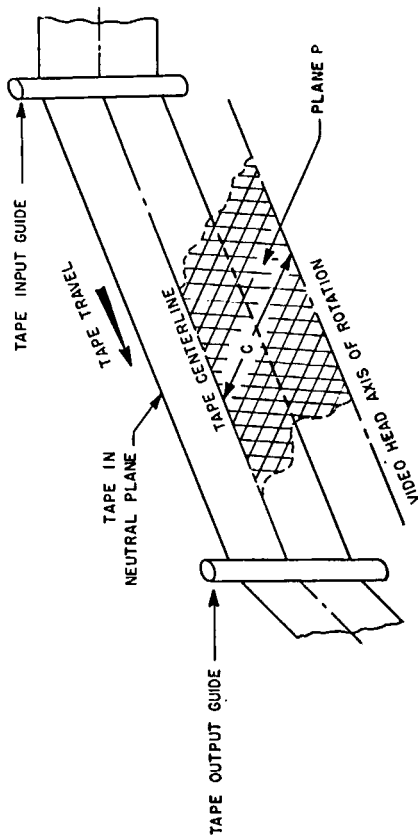


Figure 2
Relationship Between Tape Neutral Plane and Video Head Axis of Rotation

3. Dimensions

3.1 References. The plane of rotation of the pole tips and the axis of rotation of the video head wheel shall be the primary positioning references in defining the location of the elements described in this practice.

3.2 Position of Tape Neutral Plane. The centerline of the tape in the neutral plane shall be parallel to the axis of rotation of the video head wheel, and 0.905 ± 0.020 inch (22.99 ± 0.51 mm) from this axis, measured in a direction perpendicular to the tape neutral plane (Dimension C in Fig. 1). The plane passing through the axis of rotation of the video head wheel and the centerline of the tape in the neutral plane shall thus be perpendicular to the tape neutral plane (Plane P in Fig. 2).

3.3 Position of Tape Output Guide. The tape output guide shall be located 7.50 ± 0.25 inch (190.5

± 6.4 mm) from the plane of rotation of the pole tips (Dimension B in Fig. 1).

3.4 Position of Tape Input Guide. The tape input guide shall be located symmetrically with respect to the plane of rotation of the pole tips and the tape output guide (Dimension A in Fig. 1).

3.5 Tolerances on Parallelism of the Tape Neutral Plane and Symmetry of Input and Output Guides. Nonparallelism between the centerline of the tape neutral plane and the axis of rotation of the video head wheel and asymmetry in the positioning of the input and output guides about the plane of rotation of the pole tips shall, in combination, be limited so as to contain resultant track curvature and track angle within the specifications of American National Standard Dimensions of Video, Audio and Tracking Control Records on 2-in Video Magnetic Tape, C38.6-1965.

Appendix

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

1. A tape recorded at the minimum dimension for C and played back on a reproducer having the maximum dimension for C will have, during a 64- μ sec interval, a residual velocity error of less than 0.4 nanoseconds peak to peak.
2. A tape recorded with maximum allowable track curvature caused by non-parallelism, asymmetry, or both, as described in Section 3.5, and played back on a

reproducer having no dimensional errors, will have, during a 64- μ sec interval, a residual velocity error of less than 0.4 nanosecond peak to peak.

3. For Appendix 1 and 2 to be valid, all other factors (such as vacuum guide radius, vacuum level, tape tension, ambient temperature and humidity) should be the same as they were when the tape was recorded.

*Specifications for Safe Action and Safe Title Areas
Test Pattern for Television Systems*

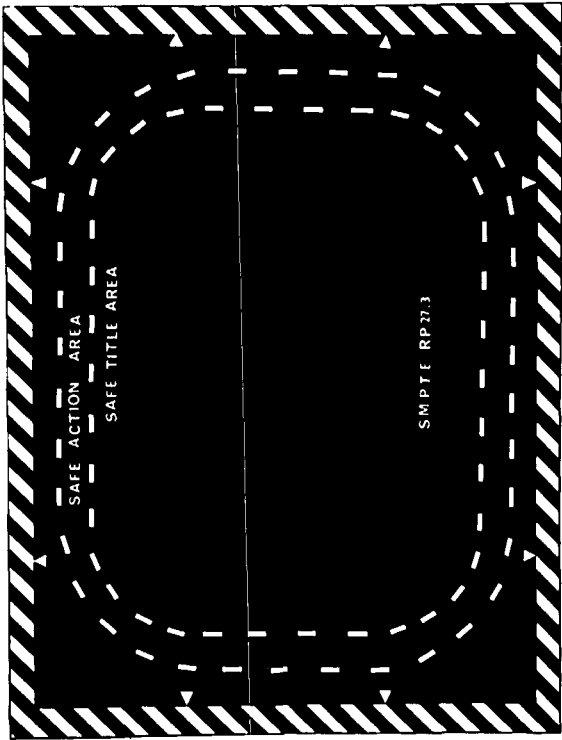


Figure 1
Reproduction of Test Pattern

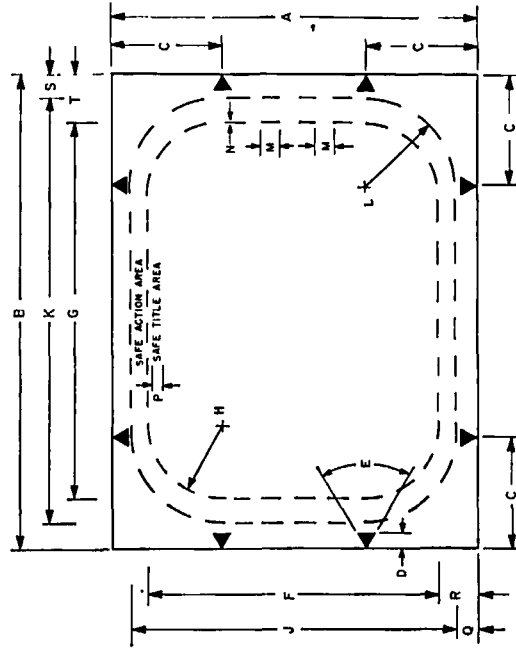


Figure 2
Dimensional Drawing of Test Pattern

1. Scope

This Recommended Practice specifies the format, dimensions and optical densities for a test pattern in accordance with SMPTE Recommended Practice RP 8-1968, Safe Action and Safe Title Areas for Television Transmission.

2. Purpose

This Recommended Practice specifies a test pattern which indicates the safe action image area within which all significant action must take place and the safe-title image area within which the more important information must be confined to ensure visibility of the information on the majority of home television receivers.

3. Format

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

3.2 Area Limit Markings. Dashed lines having the shape and dimensions shown in the figures and table shall be provided to indicate the boundaries of the safe action and title areas.

3.3 Arrows and Border. The eight boundary arrows and border define the edge of the test pattern area and the scanned area.

3.4 Pattern Identification. The identification number of this document shall appear on the pattern as 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 percentages of frame height and reproduced with a tolerance of ± 2 percent of the frame height.

4.1.1 The area identification marks shall be positioned symmetrically on the centerlines of the image area as specified in 4.4 within ± 2 percent of the respective dimension.

4.2 Image Size. The size of the scanned area as indicated by the eight boundary arrows shall be as follows:

4.2.1 2x3 in test slides shall have Category 3 dimensions, as specified in American National Standard Dimensions and Optical Specifications of Test Slides and Transparencies for Television, PH22.144:1965 (Reaffirmed 1969).

4.2.2 35mm test films shall have image dimensions in accordance with American National Standard Dimensions for Television Image Area on 35mm Motion-Picture Film, PH22.95:1963 (Reaffirmed 1969).

4.2.3 16mm test films shall have image dimensions in accordance with American National Standard Dimensions for Television Image Area on 16mm Motion-Picture Film, PH22.96:1963 (Reaffirmed 1969).

4.3 Black-and-White Border. The dimensions of the black-and-white border shall be as follows:

SMPTE RECOMMENDED PRACTICE

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

Dimensions	Inches		
	Percent	2x2	16mm
A Scanned image height	100.0	0.843	0.276
B Scanned image width	133.3333	1.124	0.368
C Position of arrow	30.0	0.253	0.083
D Arrow length	4.0	0.034	0.011
E Arrow shape, in degrees	40.0	40.0	40.0
F Height of safe title area	80.0	0.674	0.221
G Width of safe title area	106.0	0.894	0.293
H Corner radius, safe title area	21.0	0.177	0.058
J Height of safe action area	90.0	0.759	0.248
K Width of safe action area	120.0	1.012	0.331
L Corner radius, safe action area	24.0	0.202	0.066
M Length and spacing of lines	5.0	0.042	0.014
N Width of line	0.5	0.004	0.0014
P Height of letters	2.5	0.021	0.015
Q Vertical position of action area	5.0	0.042	0.014
R Horizontal position of title area	10.0	0.084	0.028
S Horizontal position of action area	6.67	0.056	0.018
T Horizontal position of title area	13.33	0.112	0.037

4.3.1 Height and width dimensions of the black-and-white border for 2x2 in slides are specified in ANSI PH22.144.1965.

4.3.2 For 35mm motion-picture films, the black-and-white border shall extend to the dimensions specified by Style A in American National Standard Dimensions of 35mm Motion-Picture Camera Aperture Images, PH22.59-1966.

4.3.3 For 16mm motion-picture films, the black-and-white border shall extend to the dimensions specified in American National Standard Dimensions of 16mm Motion-Picture Camera Aperture Image, PH22.7-1964 (Reaffirmed 1969).

4.4 Line Width. The line width of the area limit marks shall be 0.050 ± 0.03 percent of picture height.

4.5 Lettering. The lettering shall be bold and of a style and size shown in the figures.

5. Optical Densities

5.1 Optical Densities. All optical densities shall be measured in accordance with American National Standard Method of Determining Transmission Density of Motion-Picture Films, PH22.27-1960 (Reaffirmed 1969).

5.2 Background. The black background shall have a density greater than 1.9.

5.3 The density of the dashes, arrows and lettering shall be between 0.3 and 0.4.

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

1. Scope

This Recommended Practice specifies the format, dimensions and optical densities for a test pattern for measurement of television film projector image stability.

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.

2. Purpose

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

4. Dimensions

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

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 35mm and ± 0.05 percent of picture height for 16mm 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 35mm Motion-Picture Film, KS-1870, PH22.36-1964 (Reaffirmed 1969), and American National Standard Dimensions for 16mm Motion-Picture Film, 2R-3000, PH22.5-1964 (Reaffirmed 1969).

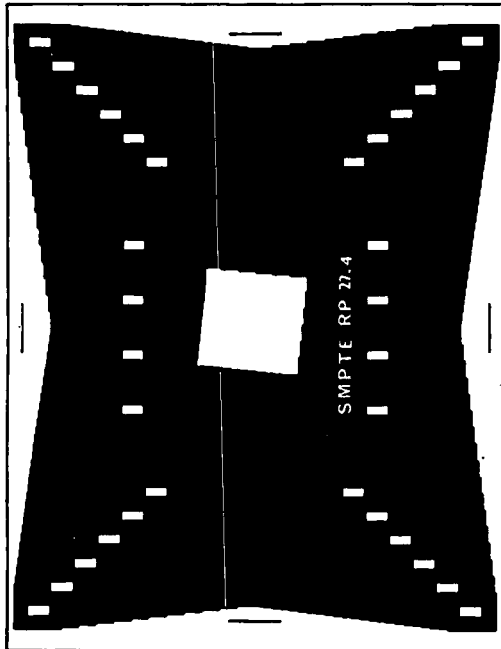


Figure 1
Reproduction of Test Pattern

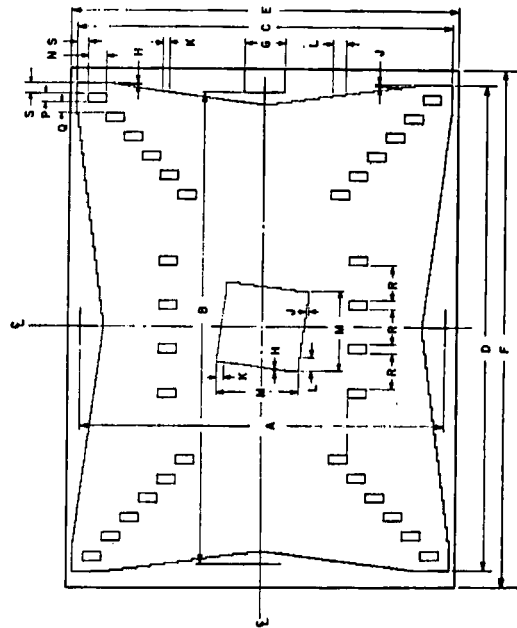


Figure 2
Dimensional Drawing of Test Pattern

	Dimensions	
	Percent	Inches
A	100.00	0.594
B	133.3333	0.276
C		0.792
D		0.285
E		0.380
F		0.295
G		0.404
H	11.25	0.067
I	0.25	0.0015
J	0.50	0.008
K	1.875	0.011
L	3.75	0.022
M	22.50	0.134
N	5.00	0.090
P	2.50	0.015
Q	3.00	0.018
R	10.00	0.059
S	3.00	0.018

4.2.1 The camera shall be capable of producing an image in accordance with Style A dimensions specified in American National Standard Dimensions for 35mm Motion-Picture Camera Aperture Images, PH22.59-1966, and American National Standard Dimensions of 16mm Motion-Picture Camera Aperture Image, PH22.7-1964 (Reaffirmed 1969).

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 Dimensions for Television Image Area on 35mm Motion-Picture Film, PH22.95-1963 (Reaffirmed 1969), and American National Standard Dimensions for Television Image Area on 16mm Mo-

tion-Picture Film, PH22.95-1963 (Reaffirmed 1969).

5. Optical Densities

5.1 Optical Densities. All optical densities shall be measured in accordance with American National Standard Method of Determining Transmission Density of Motion-Picture Films, PH22.27-1960 (Reaffirmed 1969).

5.2 Background. The background shall have a density greater than 1.9.

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

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

Specifications for Mid-Frequency Response
Test Pattern for Television

Page 1 of 4 pages

1. Scope

This Recommended Practice specifies the format, dimensions and optical densities for a test pattern to be used as an operational check of the mid-frequency response of a television system.

2. Purpose

2.1 This Recommended Practice specifies a test pattern which is suitable for the following operational checks of a television system:

(a) Performance of video amplifier circuitry under conditions that can occur at average signal levels corresponding to predominantly light and predominantly dark scenes.

(b) Operational setup and adjustment of video amplifier, mid-frequency amplitude and/or delay distortion (phase response) controls.

2.2 Usage. When incorporated into a test film, Type A (black bars on a white background) shall be shown for a minimum duration of 7 seconds followed by Type B (white bars on a black background) for a minimum duration of 7 seconds.

2.2.1 The test pattern will show mid-frequency response defects of amplitude and/or phase as either black or white horizontal streaks following transition from white to black or black to white.

2.2.2 The test pattern will detect amplifier or clamp circuit faults, as indicated by streaks of black or white polarity extending across the entire television picture at points corresponding to the mid-frequency bars of the test pattern.

3. Format

3.1 Pattern. A reproduction of the test pattern is shown in Figs. 1 and 2.

3.2. Bar Width. The four bars shall have horizontal dimensions corresponding to half-wave pulses at frequencies of 15 kHz, 50 kHz, 100 kHz and 300 kHz, respectively.

3.3 Types. The test pattern is produced in two types: Type A, black bars on a white background and Type B, white bars on a black background.

3.4 Arrows and Border. The eight boundary arrows and border define the edge of the test pattern area and the scanned area.

3.5 Pattern Identification. The identification number of this document shall appear on the pattern as specified in the figures.

4. Dimensions

4.1 Test Pattern. The dimensions of the test pattern shall be as shown in Fig. 3 and the table in percentages of frame height and reproduced with a tolerance of ± 2 percent of the frame height.

4.1.1 The bars shall be positioned symmetrically on the vertical centerline of the image area within ± 2 percent of the respective dimension.

4.2 Image Size. The size of the scanned area as indicated by the eight boundary arrows shall be as follows:

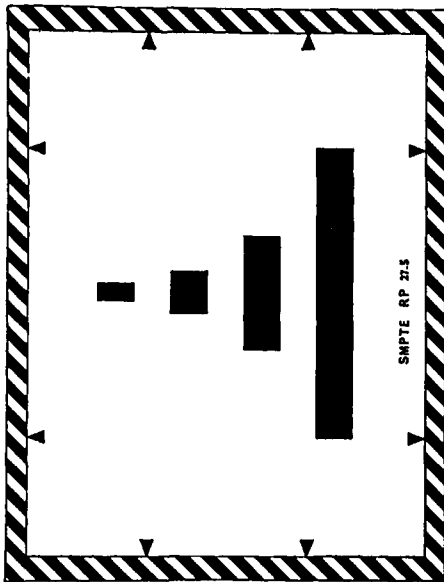


Figure 1
Reproduction of Test Pattern Type A

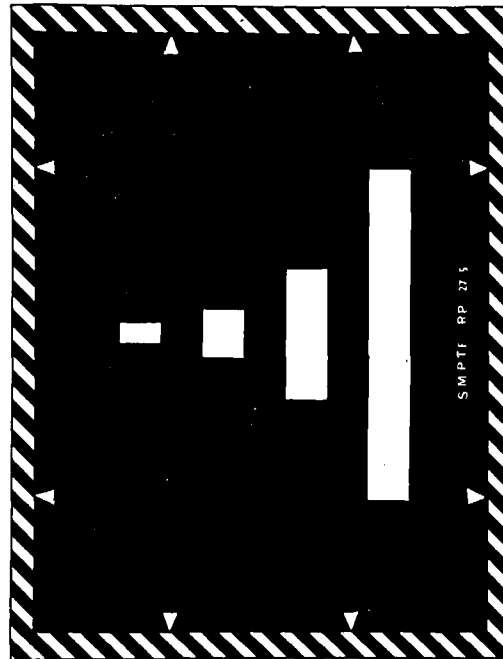


Figure 2
Reproduction of Test Pattern Type B

THIS PROPOSAL IS PUBLISHED FOR COMMENT ONLY

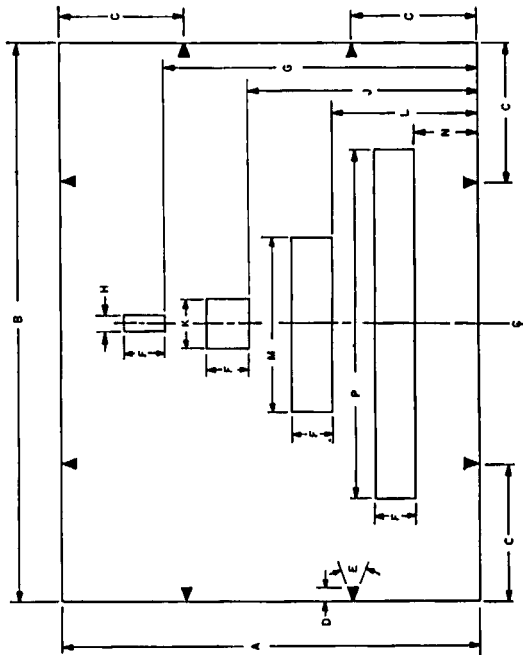


Figure 3
Dimensional Drawing of Test Pattern

Dimensions	Percent	Inches		
		2x2	8x10	16mm
A Scanned image height	100.0	0.845	6.30	0.276
B Scanned image width	133.3333	1.124	8.40	0.368
C Position of arrow from corner	30.0	0.253	1.890	0.083
D Arrow length	4.0	0.034	0.252	0.011
E Arrow shape in degrees	40.0	40.0	40.0	40.0
F Height of bars	10.0	0.084	0.650	0.028
G Position of 300-kHz bar	75.0	0.632	4.725	0.446
H Width of 300-kHz bar	4.2	0.035	0.26	0.025
J Position of 100-kHz bar	55.0	0.464	3.465	0.327
K Width of 100-kHz bar	12.7	0.107	0.800	0.075
L Position of 30-kHz bar	35.0	0.295	2.205	0.208
M Width of 30-kHz bar	42.0	0.354	2.646	0.249
N Position of 15-kHz bar	15.0	0.126	0.945	0.089
P Width of 15-kHz bar	84.0	0.708	5.292	0.499

4.2.1 2x2 in test slides and 8x10 in transparencies shall have Category 3 dimensions, as specified in American National Standard Dimensions and Optical Specifications of Test Slides and Transparencies for Television, PH22.144:1965 (Reaffirmed 1969).

4.2.2 35mm test films shall have image dimensions in accordance with Section 3.3 of American National Standard Dimensions for Television Image Area on 35mm Motion-Picture Film, PH22.95:1963 (Reaffirmed 1969).

4.2.3 16mm test films shall have image dimensions in accordance with Section 3.3 of American National Standard Dimensions for Television Image Area on 16mm Motion-Picture Film, PH22.96:1963 (Reaffirmed 1969).

4.3 Black-and-White Border. The dimensions of the black-and-white border shall be as follows:

4.3.1 Height and width dimensions of the black-and-white border for 2x2 in slides and 8x10 in transparencies are specified in ANSI PH22.144:1965.

4.3.2 For 35mm motion-picture films, the black-and-white border shall extend to the dimensions specified by Style A in American National Standard Dimensions of 35mm Motion-Picture Camera Aperture Images, PH22.30:1966.

4.3.3 For 16mm motion-picture films, the black-and-white border shall extend to the dimensions specified in American National Standard Dimensions of 16mm Motion-Picture Camera Aperture Image, PH22.7:1964 (Reaffirmed 1969).

5. Optical Densities

5.1 Optical Densities. All optical densities shall be measured in accordance with American National Standard Method of Determining Transmission Density of Motion-Picture Films, PH22.27:1960 (Reaffirmed 1969).

5.2 Test Pattern Type A

5.2.1 The background density shall be between 0.3 and 0.4.

5.2.2 The density of the bars, arrows, and identification shall be between 1.9 and 2.0.

5.3 Test Pattern Type B

5.3.1 The background density shall be greater than 1.9.

5.3.2 The density of the bars, arrows, and identification shall be between 0.3 and 0.4.

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