**RP 27.5-1989**
Revision of RP 27.5-1983

# SMPTE RECOMMENDED PRACTICE

# Specifications for Mid-Frequency Response Test Pattern for Television



## 1 Scope

This 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 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** 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.

**2.3** 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 figures 1 and 2.

### 3.2 Bar width

The four bars shall have horizontal dimensions corresponding to half-wave pulses at frequencies of 15, 30, 100, 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 figure 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.



Approved March 29, 1989


**Figure 1 – Reproduction of test pattern type A**

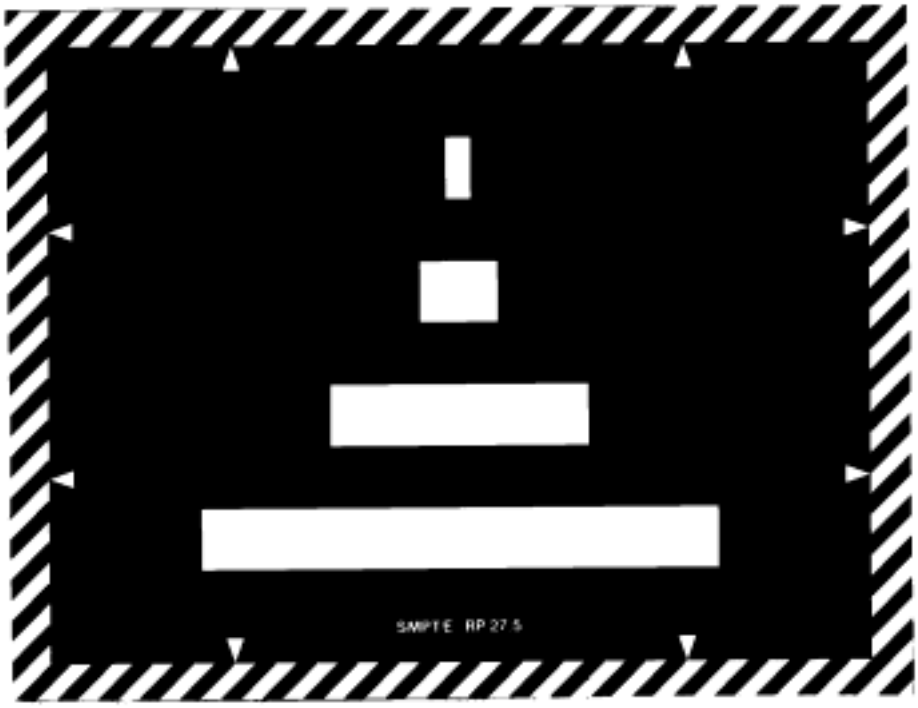


**Figure 2 – Reproduction of test pattern type B**

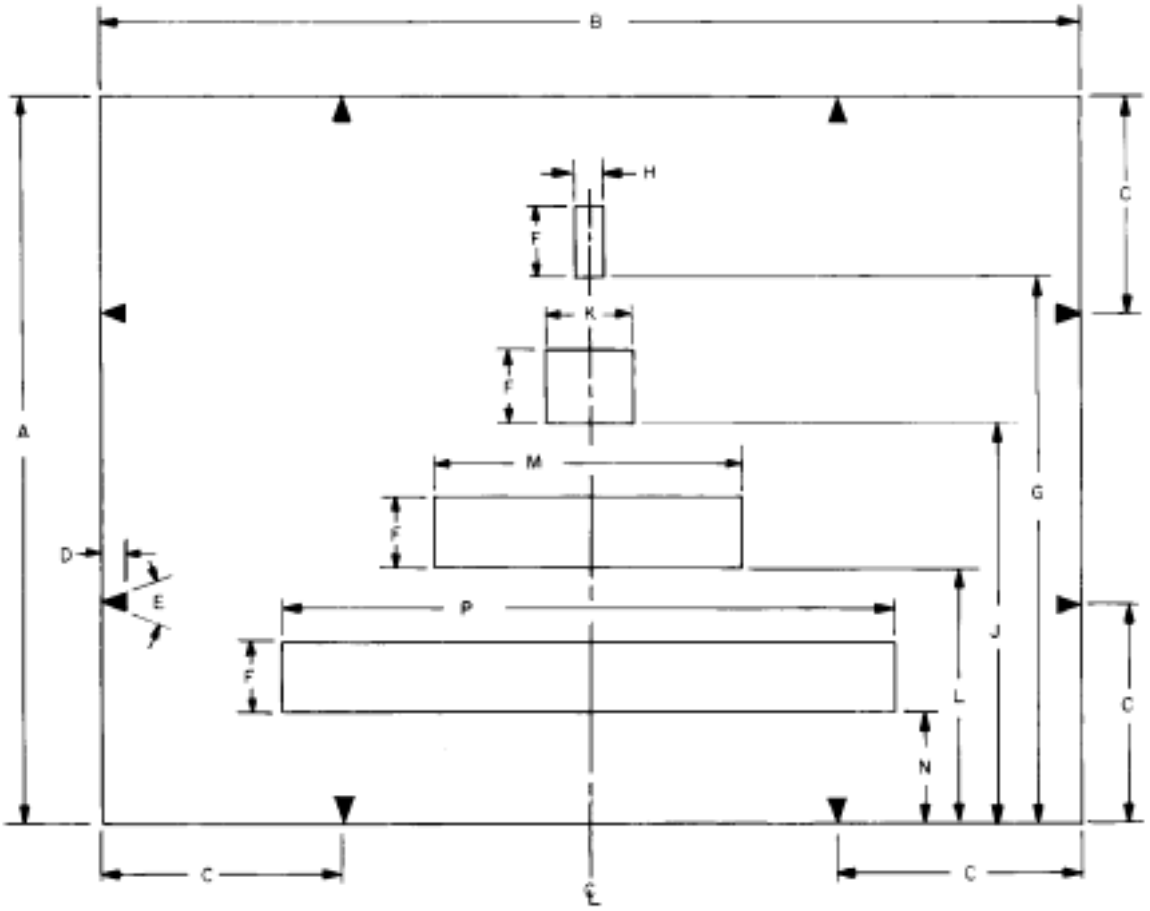


**Figure 3 – Dimensional drawing of test pattern**

| | | | Inches | | | |
|---|---|---|---|---|---|---|
| | Dimensions | Percent | 2×2 | 8×10 | 35-mm | 16-mm |
| A | Scanned image height | 100.0 | 0.843 | 6.30 | 0.594 | 0.276 |
| B | Scanned image width | 133.3333 | 1.124 | 8.40 | 0.792 | 0.368 |
| C | Position of arrow from corner | 30.0 | 0.253 | 1.890 | 0.178 | 0.083 |
| D | Arrow length | 4.0 | 0.034 | 0.252 | 0.024 | 0.011 |
| E | Arrow shape in degrees | | 40.0 | 40.0 | 40.0 | 40.0 |
| F | Height of bars | 10.0 | 0.084 | 0.630 | 0.059 | 0.028 |
| G | Position of 300-kHz bar | 75.0 | 0.632 | 4.725 | 0.446 | 0.207 |
| H | Width of 300-kHz bar | 4.2 | 0.035 | 0.26 | 0.025 | 0.012 |
| J | Position of 100-kHz bar | 55.0 | 0.464 | 3.465 | 0.327 | 0.152 |
| K | Width of 100-kHz bar | 12.7 | 0.107 | 0.800 | 0.075 | 0.035 |
| L | Position of 30-kHz bar | 35.0 | 0.295 | 2.205 | 0.208 | 0.097 |
| M | Width of 30-kHz bar | 42.0 | 0.354 | 2.646 | 0.249 | 0.116 |
| N | Position of 15-kHz bar | 15.0 | 0.126 | 0.945 | 0.089 | 0.041 |
| P | Width of 15-kHz bar | 84.0 | 0.708 | 5.292 | 0.499 | 0.232 |

### 4.2 Image size

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

**4.2.1** 35-mm test films shall have image dimensions in accordance with Sec. 5.2 of American National Standard for Motion-Picture Film (35-mm)-— Television Image Area, ANSI PH22.95-1984.

**4.2.2** 16-mm test films shall have image dimensions in accordance with Sec. 3.3 of American National Standard Dimensions for Television Image Area on 16-mm Motion-Picture Film, ANSI PH22.96-1982.

### 4.3 Black-and-white border

The dimensions of the black-and-white border shall be as follows:

**4.3.1** For 35-mm motion-picture films, the black-and-white border shall extend to the dimensions specified by style A in American National Standard for Motion-Picture Film (35-mm) — Camera Aperture Images, ANSI/SMPTE 59-1989.

**4.3.2** For 16-mm motion-picture films, the black-and-white border shall extend to the dimensions specified in American National Standard for Motion-Picture Film (16-mm) — Camera Aperture Image and Usage, ANSI/SMPTE 7-1988.

## 5 Oplical densities

### 5.1 Optical densities

All optical densities shall be measured in accordance with American National Standard for Photography — Density Measurements — Geometric Conditions for Transmission Density, ANSI PH2.19-1986.

### 5.2 Test pattern type A

**5.2.1** The background density shall be nominally clear.

**5.2.2** The density of the bars, arrows, and identification shall be greater than 1.9.

### 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 nominally clear.

NOTES

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

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