officiate as the Secretariat at the London meeting. He will be assisted by Miss Peggy Caggiano, who handles the International Secretariat activities at SMPTE Headquarters.

The voluntary nature of standardization in the US not only contributes greatly to the problem of finding appropriate talent to carry on the activity, but also necessitates financing through private means. The SMPTE assumes a major portion of the responsibility, and is indeed grateful to the commercial organizations which understand the significance of the US participation and leadership in international standardization, and assist in defraying the expenses of the activity as well as donating the valuable time of the specialists themselves.

# standards and recommended practices

## SMPTE Recommended Practices Approved

On January 21, 1971, the Society's Board of Governors approved two SMPTE Recommended Practices specifying test tapes for the 2-in quadruplex system: SMPTE Recommended Practice RP 43-1971, Video Test Tape for Quadruplex Video Frequency Magnetic Tape Recorders Operating at 15 in/s and Practice HB of SMPTE Practice RP 6, and SMPTE Recommended Practice RP 44-1971, Video Test Tape for Quadruplex Video Frequency Magnetic Tape Recorders Operating at 7.5 in/s and Practice HB of SMPTE Recommended Practice RP 6.

## SMPTE Recommended Practice Reaffirmed

On January 21, 1971, the Board of Governors, taking the recommendation of the SMPTE Engineering and Standards Committees, reaffirmed without change SMPTE Recommended Practice RP 5-1964, Dimensions of Patch Splices in 2-in Video Magnetic Tape (published in the April 1964 *Journal*).

Copies of these and other SMPTE Recommended Practices may be obtained from Society Headquarters upon request. – A.E.A.

# SMPTE RECOMMENDED PRACTICE — RP 43-1971

## *Video Test Tape for Quadruplex Video Frequency Magnetic Tape Recorders Operating at 15 in/s and Practice HB of SMPTE Recommended Practice RP 6*



1. *Scope*

This recommended practice specifies a video frequency test tape to be used with quadruplex television video tape recorders operating at 15 in/s (38.1 cm/s) and Practice HB of SMPTE Recommended Practice RP 6, Reference Carrier Frequencies and De-Emphasis Characteristics for 2-in Quadruplex Video Magnetic Tape Recording. It is to be used for:

(a) Positioning of the vacuum guide.

(b) Indication of video frequency response characteristics of the reproducing system.

(c) Adjustment of gain of the video reproducing system.

(d) Comparison of carrier frequencies of the video recording system.

(e) Verification of level and phase of the control track recording system.

(f) Adjustment of the gain of the program audio reproducing system.

2. *General Specifications*

2.1 Dimensions of Records. The dimensions of pertinent records making up this test tape shall conform to American National Standard Dimensions of Video, Audio and Tracking Control Records on 2-in Video Magnetic Tape, C98.6-1965.

2.2 Tape Speed. The nominal linear speed of this test tape shall be 15 in/s in accordance with American National Standard Speed of 2-in Tape for Quadruplex Video Magnetic Tape Recording, C98.4-1970.

2.3 Tape Stock. The test sections shall be recorded on transversely-oriented television magnetic recording tape optimized for use with Practice HB of SMPTE Recommended Practice RP 6. The dimensions of the tape stock shall be as specified in American National Standard Dimensions of 2-in Video Magnetic Tape, C98.1-1963.

2.4 Tracking Control Signal. A tracking control signal, conforming to that in SMPTE Recommended Practice RP 16-1968, Specifications of Tracking Control Record for 2-in Quadruplex Video Magnetic Tape Recordings, shall be recorded throughout the tape.

2.5 Voice announcements at the beginning of this tape shall reference this recommended practice. Voice announcements shall be recorded at a level approximately 5 dB below reference level, as defined in Section 3.1.2 of American National Standard Specifications for an Audio Level and Multifrequency Test Tape for Quadruplex Video Magnetic Tape Recorders Operating at 15 in/s, C98.8-1969. Announcement shall be recorded on Audio Record No. 1 only. A video identification signal may be included during the voice announcement section. If no video identification signal is used, sync, sync and set-up, or test signal shall be recorded on the video channel during the voice announcement.

2.6 Recorded carrier frequencies shall conform to those specified by Practice HB of SMPTE Recommended Practice RP 6; recording pre-emphasis shall be the complement of the de-emphasis characteristic specified by Practice HB of SMPTE Recommended Practice RP 6.

2.7 Tape vacuum guide radius and position shall conform to SMPTE Recommended Practice RP 11-1968, Tape Vacuum Guide Radius and Position for 2-in Quadruplex Video Magnetic Tape Recording.

2.8 Audio record shall be in accordance with American National Standard Electrical Characteristics of Audio Record One for 2-in Quadruplex Video Magnetic Tape Recording at 15 and 7.5 in/s, C98.3-1970.

2.9 Video synchronizing waveforms and signal amplitudes shall conform to the rules and regulations of the Federal Communications Commission for color transmissions. Color subcarrier synchronizing burst shall be included throughout the recording. The timing of the synchronizing waveforms shall be uninterrupted during the transition from the identification signals specified in Section 2.5 to the video test signals specified in Section 3.1 and 3.2, and shall be uninterrupted during the transitions between video test signals specified in Section 3.2.

2.10 Geometric distortion on the test tape caused by lack of exact 90° angular separation (quadrature error) of the transducers on the video head wheel making the recording shall not exceed 0.03 microseconds peak to peak.



*Approved January 1971*





2.11 The position of the tape neutral plane shall be in accordance with Proposed SMPTE Recommended Practice RP 36, Specifications for Positioning Tape Neutral Plane and Adjacent Tape Guides for Quadruplex Video Magnetic Tape Recorders Operating at 15 in/s and 7.5 in/s.

3. *Test Section*

3.1 Video Test Signals. Five types of test signals, as specified in 3.1.1 through 3.1.5, shall be recorded on the tape.

3.1.1 Color Bars. An encoded color-bar signal conforming to EIA Standard RS-189-1957, Encoded Color Bar Signals.

3.1.2 Multiburst. A white pulse followed by a series of six sine wave bursts. The white pulse width and the width of each burst shall be ½ the width of the scan line between the end of H blanking and the start of H blanking. The white bar amplitude shall be at 100 ± 1 IRE units. The axis of the bursts shall be at 50 ± 1 IRE units, and the peak-to-peak amplitude of the bursts shall be 100 ± 1 IRE units. The frequencies of the bursts in time sequence shall be 500 kHz, 1.5 MHz, 2.0 MHz, 3.0 MHz, 3.6 MHz and 4.2 MHz. Harmonic distortion of the sine wave burst signals shall be less than 1 percent.

3.1.3 Ramp. A continuous ramp (or stairstep signal consisting of 10 equal-height steps) extending from 0 to 100 IRE units, and repeating at a line rate. Color subcarrier having a peak-to-peak amplitude of 20 ± 2 IRE units shall be combined additively with the ramp (or stairstep signal).

3.1.4 Window and Pulses. A window signal, a modulated 20T (2.5 μsec) pulse, and a 2T (0.25 μsec) sine-squared pulse. All signals shall extend from 7½ ± 2½ IRE units to 100 ± 1 IRE units. The three signals shall occur on alternate lines with the window signal on one line, and the 2T and 20T pulses on the next line, with the alternation continuing throughout the field. The leading and trailing edges of the window shall correspond in shape and rise time to the leading and trailing edges of the 2T pulse, respectively. The timings of the pulses and window shall be measured at their half-amplitude points, and shall be as specified below:

(i) Leading edge of window: 0.3H after trailing edge of preceding horizontal sync pulse.

(ii) Width of window: 0.4H.

(iii) Leading edge of 20T pulse: 0.4H after trailing edge of preceding horizontal sync pulse.

(iv) Leading edge of 2T pulse: 0.2H after leading edge of 20T pulse.

(v) Tolerances: All dimensions given in (i) through (iv) shall be held within ± 0.03H.

3.1.5 Black. A signal consisting of sync, burst, and 7½ ± 2½ IRE units of set-up.

3.2 Sequence of Video Signals. The video signals shall be recorded in the sequence indicated by Table I.

TABLE I

| *Signal* | *Duration* | *Nominal Time from Start of Test Signals* | |
|---|---|---|---|
| | | *Begin* | *End* |
| Black | 0:20 | 0:00 | 0:20 |
| Multiburst | 0:30 | 0:20 | 0:50 |
| Ramp | 0:25 | 0:50 | 1:15 |
| Window and Pulses | 0:25 | 1:15 | 1:40 |
| Color Bars | 0:30 | 1:40 | 2:10 |
| Black | 0:10 | 2:10 | 2:20 |
| Multiburst | 1:30 | 2:20 | 3:50 |
| Black | 0:10 | 3:50 | 4:00 |
| Ramp | 2:20 | 4:00 | 6:20 |
| Black | 0:10 | 6:20 | 6:30 |
| Window and Pulses | 1:20 | 6:30 | 7:50 |
| Black | 0:10 | 7:50 | 8:00 |
| Color Bars | 2:20 | 8:00 | 10:20 |
| Black | 0:10 | 10:20 | 10:30 |

The tolerance on all durations shall be ± 2 seconds, with the exception of the black signals, which shall have a tolerance of +4 seconds, —0 seconds.

3.3 Audio Test Signal. A 1 kHz ± 5 percent tone shall be recorded at reference level ± ½ dB throughout the test section on Audio Record No. 1 only, except as interrupted for the announcements defined in Section 3.4.

3.4 Voice Announcements. Each time the type of signal recorded on the tape is changed, an appropriate voice announcement identifying the new signal shall be made. Instructional or precautionary information may be included in such announcements. No identifying announcements shall be required during the black signal portions of the tape. All voice announcements shall be made under the same conditions as stated in Section 2.5, except that the video test signal shall not be interrupted.

4. *Calibration*

4.1 Calibration of audio level on all test tapes for field use shall be accomplished by comparison on a calibrated reproducer with a primary audio reference level recording made in accordance with American National Standard Specifications for a Primary Audio Reference Level Recording for Quadruplex Video Magnetic Tape Recorders Operating at 15 in/s, C98.7-1969.

4.2 Audio Level Measurements. All level measurements shall be made by means of a vu meter, as specified in American National Standard Volume Measurements of Electrical Speech and Program Waves, C16.5-1954 (Reaffirmed 1961).

4.3 Video Level Measurements. All video measurements of luminance levels shall be made in accordance with American National Standard Method of Measurement of Television Luminance Signal Levels, C16.31-1959.

Note: The frequency response of a recovered video signal is a function of such variables as recording current and type of tape stock used; therefore, the optimum reproducing-equalization setting for this tape will not necessarily be the optimum reproducing-equalization setting for all other recordings.

# SMPTE RECOMMENDED PRACTICE — RP 44-1971

## *Video Test Tape for Quadruplex Video Frequency Magnetic Tape Recorders Operating at 7.5 in/s and Practice HB of SMPTE Recommended Practice RP 6*



1. *Scope*

This recommended practice specifies a video frequency test tape to be used with quadruplex television video tape recorders operating at 7.5 in/s (19.05 cm/s) and Practice HB of SMPTE Recommended Practice RP 6, Reference Carrier Frequencies and De-Emphasis Characteristics for 2-in Quadruplex Video Magnetic Tape Recording. It is to be used for:

(a) Positioning of the vacuum guide.

(b) Indication of video frequency response characteristics of the reproducing system.

(c) Adjustment of gain of the video reproducing system.

(d) Comparison of carrier frequencies of the video recording system.

(e) Verification of level and phase of the control track recording system.

(f) Adjustment of the gain of the program audio reproducing system.

2. *General Specifications*

2.1 Dimensions of Records. The dimensions of pertinent records making up this test tape shall conform to American National Standard Dimensions of Video, Audio and Tracking Control Records on 2-in Video Magnetic Tape, C98.6-1965.

2.2 Tape Speed. The nominal linear speed of this test tape shall be 7.5 in/s in accordance with American National Standard Speed of 2-in Tape for Quadruplex Video Magnetic Tape Recording, C98.4-1970.

2.3 Tape Stock. The test sections shall be recorded on transversely-oriented television magnetic recording tape optimized for use with Practice HB of SMPTE Recommended Practice RP 6. The dimensions of the tape stock shall be as specified in American National Standard Dimensions of 2-in Video Magnetic Tape, C98.1-1963.

2.4 Tracking Control Signal. A tracking control signal, conforming to that in SMPTE Recommended Practice RP 16-1968, Specifications of Tracking Control Record for 2-in Quadruplex Video Magnetic Tape Recordings, shall be recorded throughout the tape.

2.5 Voice announcements at the beginning of this tape shall reference this recommended practice. Voice announcements shall be recorded at a level approximately 5 dB below reference level, as defined in Section 3.1.2 of American National Standard Specifications for an Audio Level and Multifrequency Test Tape for Quadruplex Video Magnetic Tape Recorders Operating at 7.5 in/s, C98.11-1969. Announcement shall be recorded on Audio Record No. 1 only. A video identification signal may be included during the voice announcement section. If no video identification signal is used, sync, sync and set-up, or test signal shall be recorded on the video channel during the voice announcement.

2.6 Recorded carrier frequencies shall conform to those specified by Practice HB of SMPTE Recommended Practice RP 6; recording pre-emphasis shall be the complement of the de-emphasis characteristic specified by Practice HB of SMPTE Recommended Practice RP 6.

2.7 Tape vacuum guide radius and position shall conform to SMPTE Recommended Practice RP 11-1968, Tape Vacuum Guide Radius and Position for 2-in Quadruplex Video Magnetic Tape Recording.

2.8 Audio record shall be in accordance with American National Standard Electrical Characteristics of Audio Record One for 2-in Quadruplex Video Magnetic Tape Recording at 15 and 7.5 in/s, C98.3-1970.

2.9 Video synchronizing waveforms and signal amplitudes shall conform to the rules and regulations of the Federal Communications Commission for color transmissions. Color subcarrier synchronizing burst shall be included throughout the recording. The timing of the synchronizing waveforms shall be uninterrupted during the transition from the identification signals specified in Section 2.5 to the video test signals specified in Section 3.1 and 3.2, and shall be uninterrupted during the transitions between video test signals specified in Section 3.2.

2.10 Geometric distortion on the test tape caused by lack of exact 90° angular separation (quadrature error) of the transducers on the video head wheel making the recording shall not exceed 0.03 microseconds peak to peak.



*Approved January 1971*





2.11 The position of the tape neutral plane shall be in accordance with Proposed SMPTE Recommended Practice RP 36, Specifications for Positioning Tape Neutral Plane and Adjacent Tape Guides for Quadruplex Video Magnetic Tape Recorders Operating at 15 in/s and 7.5 in/s.

3. *Test Section*

3.1 Video Test Signals. Five types of test signals, as specified in 3.1.1 through 3.1.5, shall be recorded on the tape.

3.1.1 Color Bars. An encoded color-bar signal conforming to EIA Standard RS-189-1957, Encoded Color Bar Signals.

3.1.2 Multiburst. A white pulse followed by a series of six sine wave bursts. The white pulse width and the width of each burst shall be ½ the width of the scan line between the end of H blanking and the start of H blanking. The white bar amplitude shall be at 100 ± 1 IRE units. The axis of the bursts shall be at 50 ± 1 IRE units, and the peak-to-peak amplitude of the bursts shall be 100 ± 1 IRE units. The frequencies of the bursts in time sequence shall be 500 kHz, 1.5 MHz, 2.0 MHz, 3.0 MHz, 3.6 MHz and 4.2 MHz. Harmonic distortion of the sine wave burst signals shall be less than 1 percent.

3.1.3 Ramp. A continuous ramp (or stairstep signal consisting of 10 equal-height steps) extending from 0 to 100 IRE units, and repeating at a line rate. Color subcarrier having a peak-to-peak amplitude of 20 ± 2 IRE units shall be combined additively with the ramp (or stairstep signal).

3.1.4 Window and Pulses. A window signal, a modulated 20T (2.5 μsec) pulse, and a 2T (0.25 μsec) sine-squared pulse. All signals shall extend from 7½ ± 2½ IRE units to 100 ± 1 IRE units. The three signals shall occur on alternate lines with the window signal on one line, and the 2T and 20T pulses on the next line, with the alternation continuing throughout the field. The leading and trailing edges of the window shall correspond in shape and rise time to the leading and trailing edges of the 2T pulse, respectively. The timings of the pulses and window shall be measured at their half-amplitude points, and shall be as specified below:

(i) Leading edge of window: 0.3H after trailing edge of preceding horizontal sync pulse.

(ii) Width of window: 0.4H.

(iii) Leading edge of 20T pulse: 0.4H after trailing edge of preceding horizontal sync pulse.

(iv) Leading edge of 2T pulse: 0.2H after leading edge of 20T pulse.

(v) Tolerances: All dimensions given in (i) through (iv) shall be held within ± 0.03H.

3.1.5 Black. A signal consisting of sync, burst, and 7½ ± 2½ IRE units of set-up.

3.2 Sequence of Video Signals. The video signals shall be recorded in the sequence indicated by Table I.

**TABLE I**

| *Signal* | *Duration* | *Nominal Time from Start of Test Signals* | |
|---|---|---|---|
| | | *Begin* | *End* |
| Black | 0:20 | 0:00 | 0:20 |
| Multiburst | 0:30 | 0:20 | 0:50 |
| Ramp | 0:25 | 0:50 | 1:15 |
| Window and Pulses | 0:25 | 1:15 | 1:40 |
| Color Bars | 0:30 | 1:40 | 2:10 |
| Black | 0:10 | 2:10 | 2:20 |
| Multiburst | 1:30 | 2:20 | 3:50 |
| Black | 0:10 | 3:50 | 4:00 |
| Ramp | 2:20 | 4:00 | 6:20 |
| Black | 0:10 | 6:20 | 6:30 |
| Window and Pulses | 1:20 | 6:30 | 7:50 |
| Black | 0:10 | 7:50 | 8:00 |
| Color Bars | 2:20 | 8:00 | 10:20 |
| Black | 0:10 | 10:20 | 10:30 |

The tolerance on all durations shall be ± 2 seconds, with the exception of the black signals, which shall have a tolerance of +4 seconds, —0 seconds.

3.3 Audio Test Signal. A 1 kHz ± 5 percent tone shall be recorded at reference level ± ½ dB throughout the test section on Audio Record No. 1 only, except as interrupted for the announcements defined in Section 3.4.

3.4 Voice Announcements. Each time the type of signal recorded on the tape is changed, an appropriate voice announcement identifying the new signal shall be made. Instructional or precautionary information may be included in such announcements. No identifying announcements shall be required during the black signal portions of the tape. All voice announcements shall be made under the same conditions as stated in Section 2.5, except that the video test signal shall not be interrupted.

4. *Calibration*

4.1 Calibration of audio level on all test tapes for field use shall be accomplished by comparison on a calibrated reproducer with a primary audio reference level recording made in accordance with American National Standard Specifications for a Primary Audio Reference Level Recording for Quadruplex Video Magnetic Tape Recorders Operating at 7.5 in/s, C98.10-1969.

4.2 Audio Level Measurements. All level measurements shall be made by means of a vu meter, as specified in American National Standard Volume Measurements of Electrical Speech and Program Waves, C16.5-1954 (Reaffirmed 1961).

4.3 Video Level Measurements. All video measurements of luminance levels shall be made in accordance with American National Standard Method of Measurement of Television Luminance Signal Levels, C16.31-1959.

Note: The frequency response of a recovered video signal is a function of such variables as recording current and type of tape stock used; therefore, the optimum reproducing-equalization setting for this tape will not necessarily be the optimum reproducing-equalization setting for all other recordings.