

3. Film Stock

The film stock used shall be of the low-shrinkage, safety type, cut and perforated in accordance with American National Standard Dimensions for 16-mm Motion-Picture Film Perforated 8-mm Type S, (1-3), ANSI PH22.151-1981.

NOTE 1: The width and edge-to-perforation distance of the 8-mm slit strip shall be in accordance with ANSI PH22.151-1981. The location of the magnetic record and balance strips shall be in accordance with American National Standard Dimensions of Magnetic Striping of 8-mm Type S Motion-Picture Film, ANSI PH22.161-1980. Consequently, it is not possible to take full advantage

of the tolerances of both the slit width and the location of the magnetic record and balance strips.

NOTE 2: Tolerances for the center recording stripe and center balance stripe are specified to permit usage of a single wide stripe or two separate stripes. If two stripes are used, the amount of separation between the stripes should be sufficient to permit fitting within the requisites of the standard without obtaining undesirable feather edges of magnetic material. The separation required is determined by laboratory practice.

NOTE 3: Notwithstanding the tolerance on Dimensions M, N, S, and T, the width of the stripes, Dimensions N minus M and T minus S, shall be 0.025 in (0.635 mm) minimum.

SMPTE RECOMMENDED PRACTICE

Density and Contrast Range of Black-and-White Films and Slides for Television

RP 7-1982



1. Scope

This practice specifies important density values of black-and-white 16-mm and 35-mm motion-picture films and slides intended for television transmission.

2. Density Requirements

2.1 The minimum diffuse density of highlight areas shall have a normal value of 0.4 to 0.5 but not less than 0.3 for optimum reproduction in the television system. This value is not intended to apply to glint, specular highlights, or other small areas where details need not be reproduced.

2.2 The maximum diffuse density of lowlight areas shall have a normal value of 1.9 to 2.0 but not greater than 2.0 for optimum reproduction in the television system. This value is not intended to apply to areas where details need not be reproduced.

2.3 The density of human faces, usually observed more intently than other picture areas, shall be greater than the measured minimum density as specified in 2.1 above by a value not less than 0.15 or more than 0.5, unless special effects are desired. These density values are important in order to preserve the proper density relationships between face tones and highlights.

2.4 Density values on film intended for television, having a dyed or other base of significant minimum density, must be increased in all cases by the amount that such base density exceeds clear base density.

3. Measurement

3.1 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.

ANSI PH22.176-1982

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Specifications of Tracking Control Record for 2-in Quadruplex Video Magnetic Tape Recordings



shall be as specified in Figs. 1a and 1b and the table.

This practice specifies the recorded dimensional relationships among (a) tracking control signal, (b) frame pulse signal, and (c) vertical synchronizing signal for 2-in (50.8 mm) quadruplex video magnetic tape recordings.

1. Scope

2.1 The dimensional relationships among the tracking control record, frame pulse record and video record, not specified elsewhere in this practice,

2. Dimensions

2.2 Dimensions pertaining to the video, audio, and control records on 2-in magnetic tape shall be as specified in American National Standard Dimensions of Video, Audio and Tracking Control Records on 2-in Video Magnetic Tape Quadruplex Recorded at 15 and 7.5 in/s, ANSI V98.6-1981.

3. Magnetic Coating

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

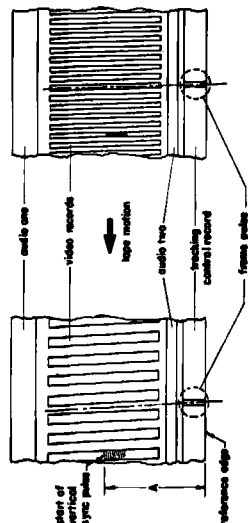


Fig. 1a. 15 in/sec

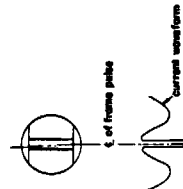


Fig. 1c. Enlargement of Frame Pulse Area

Dimension	Inch		Millimeter	
	Minimum	Maximum	Minimum	Maximum
A	1.135	1.165	28.83	29.39

4. Frame Pulse

- 4.1 A pulse to identify the position of the vertical synchronizing pulse shall be superimposed on the tracking control signal.
- 4.2 One pulse shall be recorded per television frame to identify the vertical blanking interval that is preceded by a full horizontal line when the tape is recorded at 15 in/s (381 mm/s) and to identify

the vertical blanking interval that is preceded by a half horizontal line when the tape is recorded at 7.5 in/s (190.5 mm/s). (See Appendix A.5.)
To assist in certain restricted types of color editing, alternate frame pulses may be omitted. Since omission of alternate frame pulses may result in slightly lengthened lock-up time in tape replay, users may wish to obtain prior agreement before distributing such tapes.

4.3 The pulse shall be positioned so that the centerline of the recorded pulse and the extended centerline of the area between the second and third video tracks after the track containing the vertical synchronizing pulse shall intersect within ± 0.002 in (± 0.05 mm) at the reference edge of the tape when the recording is made at 15 in/s tape speed (Fig. 1a). The pulse shall be positioned so that the centerline of the recorded pulse and the extended centerline of the fifth video track after the track containing the vertical synchronizing pulse shall intersect within ± 0.002 in at the reference edge of the tape when the recording is made at 7.5 in/s tape speed (Fig. 1b).

4.4 The amplitude of the frame pulse shall be 150 \pm 25 percent of the peak-to-peak value of the sinusoidal tracking control signal current in the record head.

4.5 The polarity of the pulse with respect to the tracking control signal shall be as shown in Fig. 1c.

4.6 The pulse shall be 150 ± 30 μ sec wide at the 50 percent amplitude points of the current waveform in the record head. The rise and fall times of the pulse shall be 15 ± 10 μ sec measured between the 10 and 90 percent points on the waveform.

Within observable and measurable on developed tape with varying recording level and properties of the developing solution. (See Appendix A.4.)

Appendix

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

A1. The transfer characteristic of magnetic tape is nonlinear. The B, L, curve of the tape as recorded has a shape indicated in Fig. 2a. When a sinusoidal record current (Fig. 2b) is applied to the record head, the resulting recorded flux density is as shown in Fig. 2b. The playback voltage waveform (Fig. 2c) is the first derivative of the recorded flux. Thus, the zero axis crossing region of the reproducing signal corresponds to the maximum recorded flux region. The verge of saturation is considered to be the condition where the recorded flux waveform is just noticeably flattened on its peaks. This flattening of the flux peaks results in an inflection in the reproducing signal waveform in the zero axis crossing region. The verge of saturation can thus be determined by increasing the record current until a barely perceptible inflection occurs in the zero axis crossing region of the reproducing signal.

A2. Areas to which a compass is attracted (see Sec. 5.4) do not coincide with point of maximum record current. The compass will be attracted to two areas (X, as shown in Fig. 2) adjacent to the point where the record current crosses the zero axis. The two areas will appear as bars when the track is developed with carbonyl iron or an equivalent material.

A3. The location of vertical sync and the frame pulse, as specified herein, will apply only if the recorder video head and capstan servos are referenced to a synchronizing signal that is in time coincidence with the video at the recorder.

A4. Recordings made in accordance with this frame pulse specification will reproduce satisfactorily on equipment presently in use without requiring equipment modification. However, modification of existing recording equipment to meet this specification may be made by users or

5. **Tracking Control Signal**

5.1 The frequency of the tracking control signal shall be four times the field frequency of the television video signal.

5.2 The amplitude of the tracking control signal current in the recording head shall be such that the tape is driven to the verge of saturation. This amplitude can be established by the method described in Appendix A1.

5.3 The tracking control signal shall be positioned so that a point of maximum record current and the extended centerline of the area between the second and third video tracks after the track containing the vertical synchronizing pulse shall coincide within ± 0.001 in (± 0.03 mm) at the reference edge of the tape when the recording is made at 15 in/s tape speed.

5.4 The tracking control signal shall be positioned so that a point of maximum record current and the extended centerline of the fifth video track after the track containing the vertical synchronizing pulse shall coincide within ± 0.001 in (± 0.03 mm) at the reference edge of the tape when the recording is made at 7.5 in/s tape speed.

5.5 The point of maximum record current coinciding with the frame pulse shall be one that immediately follows an area on the control record to which a south-seeking pole of a compass will be attracted.

5.6 The wave shape of the tracking control signal current in the record head should be Le sinusoidal.

manufacturers in order to increase the overall reliability of the frame pulse recovery. Recordings made according to earlier versions of RP 16 contain less energy in the recorded frame pulse and this fact should be taken into account in the design of new equipment.

A5. In present practice, this pulse is derived from the vertical sync signal that is preceded by a half horizontal line for both the 15 in/s case and the 7.5 in/s case. The placement on the tape specified by Sec. 4.2 is a consequence of the displacement between the video head wheel and the control track head which records this pulse.

Fig. 2

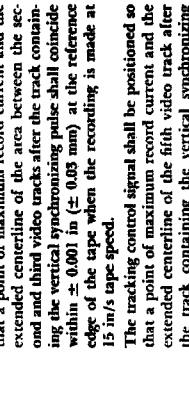


Fig. 2