ANSI/SMPTE 256M-1996
Revision of
ANSI/SMPTE 256M-1991

SMPTE STANDARD

for Television — Specifications for Video Tape Leader

1 Scope

1.1 This standard specifies the minimum requirements for the content and duration of signals recorded prior to the start of the recorded program material to permit setup and adjustment of equipment for optimum performance during reproduction.

1.2 The standard also specifies a visual and aural countdown sequence to facilitate program cuing and specifies the duration of video tape that precedes and follows the recorded material to provide the minimum lengths of tape required to ensure proper threading in video tape systems which do not employ tape cassettes.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent edition of the standards listed below:

EIA-189-A, Encoded Color Bar Signal

SMPTE EG 1-1990, Alignment Color Bar Test Signal for Television Picture Monitors

SMPTE RP 142-1993, Stereo Audio Track Allocations and Identification of Noise Reduction for Video Tape Recording

3 Runup section

In video tape systems which do not employ a tape cassette, there shall be a 10-second minimum duration runup section of blank tape (see figure 1(A)) prior to the recording of any signals on the tape.

4 Noise reduction

This segment of the video tape leader shall be used only if an external audio noise-reduction encoding system, not inherent to the video tape format being used, is applied to the program audio material and decoding is required during the playback. The use of external audio noise reduction is not covered by SMPTE specifications, and must be by mutual agreement. The tape shall be labelled with information about the form of external audio noise reduction used.

4.1 Video

A video signal as specified in 5.1 shall be recorded in this video segment (see figure 1(B)) for a duration equal to the total duration of the audio signals specified in 4.2.1 and 4.2.2.

4.2 Audio

4.2.1 Noise-reduction identification

An interrupted tone of 5-second minimum duration shall be recorded in this audio segment (see figure 1(C)) at the level and frequency specified in 5.2.1. The interruptions may be of any duration and frequency that will be observed or heard by the operator during playback, nominally of 1-second duration at 1-second intervals.

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4.2.2 Noise-reduction alignment

If the external audio noise-reduction system being used requires an alignment signal or signals, they shall be recorded in this audio segment (see figure 1(D)) for a minimum of 30 seconds. This signal must not be recorded unless the noise-reduction identification specified in 4.2.1 is also recorded.

4.3 Leader noise reduction

If an external audio noise-reduction encoding system is used for the program material, the audio signals specified in 5.2 should be recorded without external audio noise-reduction encoding whenever practical.

5 Basic leader

5.1 Video

5.1.1 Color bar signal

A color bar pattern as defined by EIA-189-A or SMPTE EG 1 shall be recorded in this video segment (see figure 1(E)) for a duration equal to the total duration of the audio signals specified in 5.2.1, 5.2.2, and 5.2.3. Color bar signals shall be recorded with maximum luminance at 77 IRE units corresponding to a 75% chroma level, and shall include a reference white bar and a reference black bar. The recording of the color bar signal shall be made under the same conditions of equipment adjustment as used for recording the program video material. For original recording, the color bar signal shall originate in and be fed through the same studio and equipment used for the program. In the case of monochrome recordings, a stair-step signal may be substituted for the color bar signal.

5.1.2 Slate and countdown

Visual identification information shall be recorded in this video segment (see figure 1(F)) for a duration equal to the duration of the audio signals specified in 5.2.4. The identification shall contain the following information (if known):

1) title
2) subject
3) production number

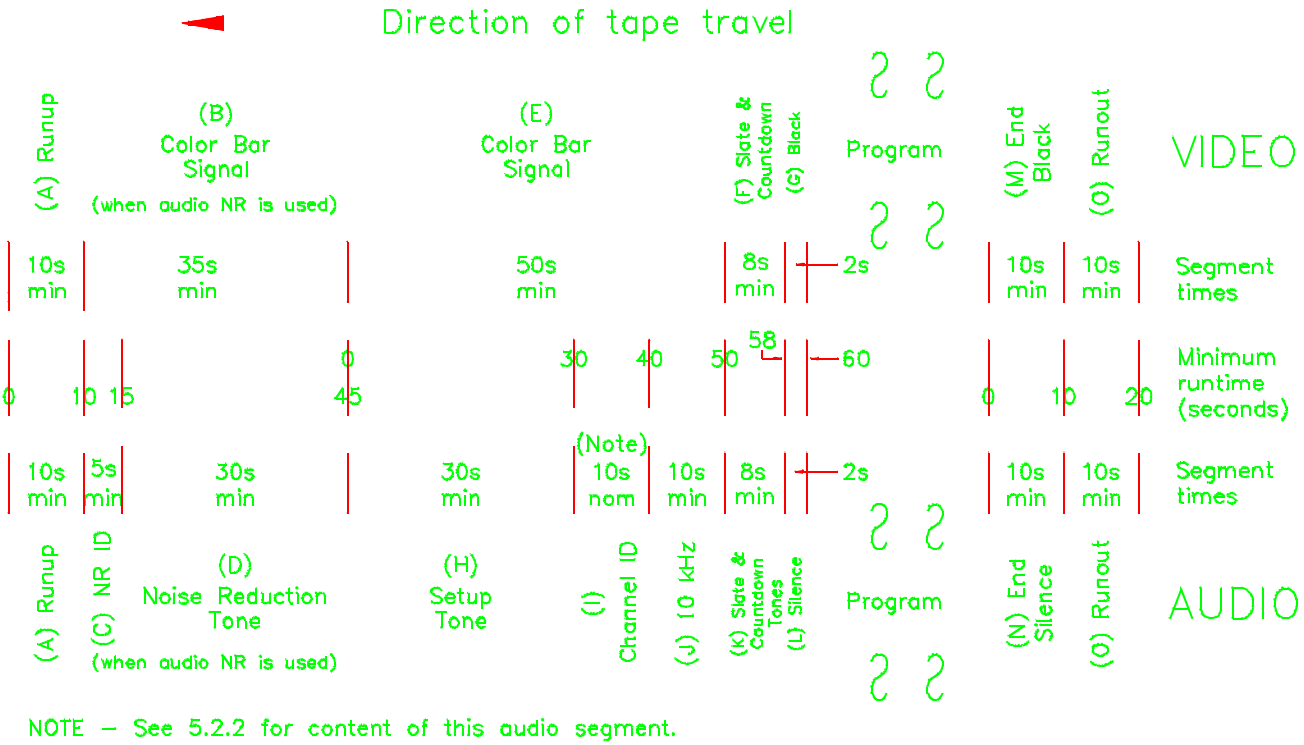

Figure 1 – Video tape leader

4) take number
5) name of recording studio
6) date of recording
7) broadcast date

In addition, a visual seconds countdown shall be recorded in this video segment, beginning with the number representing the seconds remaining until the start of program, decreasing with each elapsed second, and ending with the number 2. Each visual countdown number shall appear coincident with the beginning of the corresponding tone burst specified in 5.2.4 and shall remain until the beginning of the next tone burst, with the exception of the number 2, which shall appear for a single video frame beginning 2 seconds before the program start.

5.1.3 Black

A video black signal (sync, color burst, and setup) shall be recorded in this video segment (see figure 1(G)), beginning with the video frame following the countdown number 2 and ending with the video frame preceding the start of program.

5.2 Audio

5.2.1 Setup tone

An audio setup tone shall be recorded in this audio segment (see figure 1(H)) for a minimum of 30 seconds. The tone shall consist of a sine wave of a single frequency between 400 Hz (nominal) and 1000 Hz (nominal) at a level matching the operating level of the program material (normally reference level flux for the tape format being used). The tone recorded on all audio tracks shall originate from the same oscillator and be coherent in phase on all audio tracks.

5.2.2 Channel identification

5.2.2.1 Monophonic audio recording

When the program audio is a monophonic recording, the audio setup tone specified in 5.2.1 shall continue on all audio tracks in this audio segment (see figure 1(I)) for a 10-second nominal duration.

5.2.2.2 Stereophonic audio recording

When the program audio is a stereophonic recording, a sequence of audio tones of frequency and level as specified in 5.2.1 shall be recorded in this audio segment (see figure 1(I)) for a 10-second nominal duration. The pattern of this sequence of audio tones shall be as given in table 1. The exact duration of these tones is not critical providing there is a single burst of audible tone on the left channel followed by two bursts of audible tone on the right channel. The left and right channels are defined in SMPTE RP 142 and the individual recording format standards.

5.2.3 10 kHz

A 10-kHz sine wave with the same input level as the signal specified in 5.2.1 shall be recorded on all tracks in this audio segment (see figure 1(J)) for a minimum of 10 seconds.

Table 1 – Sequence of audio tones for stereophonic audio channel identification

	Left channel	Right channel	Nominal duration
Segment 1	Silence	Silence	1.4 seconds
Segment 2	Tone burst	Silence	1.4 seconds
Segment 3	Silence	Silence	1.4 seconds
Segment 4	Silence	Tone burst	1.4 seconds
Segment 5	Silence	Silence	1.4 seconds
Segment 6	Silence	Tone burst	1.4 seconds
Segment 7	Silence	Silence	1.4 seconds

5.2.4 Slate and countdown tone bursts

A series of countdown tone bursts shall be recorded on all tracks in this audio segment (see figure 1(K)). The tone bursts shall be of a frequency and level as specified in 5.2.1, and shall each be of 1 video frame duration. The start of each tone burst shall be coincident with the corresponding seconds transition before the program start (see figure 2). The tone bursts shall begin 8 or more seconds preceding the program start and shall end with the tone burst 2 seconds before the program start. In addition, an aural recording of all or part of the information in 5.1.2 may be recorded in this audio segment, but it shall not interfere with the intelligibility of the countdown tone bursts.

5.2.5 Silence

Silence shall be recorded on all tracks in this audio segment (see figure 1(L)) from the end of the 2-second tone burst to the beginning of the program.

6 End

6.1 Video

A video black signal (sync, color burst, and setup) shall be recorded in this video segment (see figure 1(M)) for a minimum of 10 seconds.

6.2 Audio

Silence shall be recorded on all tracks in this audio segment (see figure 1(N)) for a minimum of 10 seconds.

7 Runout section

In video tape systems which do not employ a tape cassette, there shall be a 10 second minimum duration runout section of blank tape (see figure 1(O)) following the recording of all signals on the tape.

Figure 2 – Countdown signal alignment