NBC ENGINEERING PRACTICE

TITLE: Specifications for Recorded Television Tape for Commercials

PRACTICE NO: 18.001

EFFECTIVE: 07-07-86

SUPERSEDES: ---

REVIEW: 03-05-87

SCOPE: The purpose of this document is to provide technical specifications which serve as a guide to those producing television tapes for playback on the NBC Television Network or at the NBC Owned and Operated Stations.

1.0 APPLICABLE DOCUMENTS

The following documents form a part of this practice to the extent specified herein. In the event of conflict between the contents of this specification and the documents referenced, the contents of this practice shall be considered a superseding requirement.

1. V98.19M-1983, American National Standard for Video Recording - 1" Type C records.

2. SMPTE RP20M-1985, American National Standard for Video Recording - 1" Type C recorders and reproducers - frequency response and reference level.

3. V98.25M-1982; American National Standard, Dimensions of 1" Video Magnetic Recording Tape.

4. SMPTE RP24M-1985; American National Standard for Video Recording - 1" Reel Dimensions.

5. EIA RS-170A (Proposed), Color Television System, Composite Video Signal Standards.

6. NBC 03.001, Recommended Practice on Vertical and Horizontal Blanking.

7. SMPTE RP86-1985, Video Record Parameters for 1" Type C Helical-Scan Video Tape Recording.

8. ANSI V98.9-1983, American National Standard for video recording - magnetic tape - color leader. (Reference)

9. EIA RS-189, Encoded Color Bar Signals.

2.0 APPLICATION

This specification outlines the requirements that must be met to assure satisfactory video tape reproduction on NBC facilities. They are based largely on standards proposed by SMPTE, modified and supplemented as necessary to reflect NBC's experience.

NBC reserves the right at all its offices to refuse to broadcast or otherwise utilize television tape recordings which, in its opinion, are technically unsatisfactory.

3.0 VIDEO TAPE FORMAT

Submission of recorded commercial material shall be on 1 inch, Type C video tape that meets or exceeds all physical and technical recording characteristics for 1 inch Type C Helical video tape as set forth in the referenced documents V98.19M-1983 and RP20M-1985.

4.0 TECHNICAL RECORDING CHARACTERISTICS - 1 INCH

4.1 TAPE

4.1.1 The tape provided shall conform to V98.25M-1982.

4.1.2 The tape shall be longitudinally oriented for helical recording. "Dropouts", manifested as horizontal streaks, shall be no more than 1 per ten-second interval or portion thereof.

4.1.3 The tape shall be a continuous medium without splices.

4.1.4 The tape shall be free on its coated side from indentations, creases, scratches, and other imperfections. The edges of the tape shall be free from "nicks", tears, and similar defects.

4.1.5 The tape reel used shall conform to RP 24M-1985.

4.2 VIDEO SIGNAL

4.2.1 The video signal to be recorded shall be composite video signal in accordance with EIA and FCC specified monochrome and color signal standards. Reference EIA RS-170A (Proposed) and NBC document 03.001.

4.2.2 Reference Carrier Frequencies, Pre-emphasis and De-emphasis shall conform to those specified in SMPTE Recommended Practice RP86-1985.

4.3 SYNCHRONIZING SIGNAL

All video recordings shall be made with head servo control circuitry phase locked to the input video signal.

4.4 AUDIO SIGNAL

4.4.1 The overall frequency response of the sound recording shall be within $\pm$3 dB from 50 to 15,000 Hz when referenced to 400Hz at 100nWb/m.

4.4.2 The unweighted signal-to-noise ratio shall be at least 55 dB referenced to the 3% distortion level.

4.4.3 The total harmonic distortion shall not exceed 1% r.m.s. at 400 Hz referenced to 100nWb/m.

4.4.4 Noise reduction (e.g. Dolby A, DBX) is not requested at this time. (Eventually, if noise reduction is incorporated, the specific type of noise reduction system should be indicated on the slate, reel, and reel container.)

4.5 AUDIO TRACK UTILIZATION

4.5.1 For commercial or other material which is mono in its entirety, track 1 shall be used.

4.5.2 For commercial or other material which is stereo in its entirety, discrete left and right tracks shall be provided with the left channel on track 1 and the right channel on track 2. No additional (3rd) mono track is needed.

4.5.3 For commercial and other material which contains both mono and stereo sections interspersed, discrete left and right tracks shall be provided for the stereo portion(s), with the left channel on track 1 and the right channel on track 2. The mono section(s) shall be recorded on tracks 1 and 2, in-phase and at equal level. No additional (3rd) mono track is needed.

4.5.4 Insofar as the majority of receivers for some time to come will produce only a mono mix of the stereo (L+R) tracks, it is essential that a 1:1, in-phase mix of tracks 1 and 2 produce acceptable mono sound without distorted level relationships between dialogue, music, and effects.

Regarding the post-production creative approach to stereo mixing, we advise that, as is now common practice in stereo theatrical mixing, the dialogue track be kept in the center position with possible rare exceptions.

4.6 RE-RECORDING OR "DUBBING"

The re-recording or "dubbing" of video tapes shall be done by the "video dubbing" method. In this method, the reproduced signal to be re-recorded is supplied to the "dubbing" recorder's video input in NTSC format.

The pulse widths on all dubs shall conform to NBC document 03.001.

5.0 TV TAPE LEADER AND PROGRAM IDENTIFICATION

5.1 SYSTEM CONSIDERATIONS

These minimum requirements include consideration of normal operating requirements and provide for sufficient time to permit adjustment of equipment for optimum video and stereo/mono audio performance prior to the start of the recorded material.

It is essential that the audio and the video recorded at the head of the tape, together comprising a test and set-up leader, provide the following information:

- Standard video level.
- Standard audio level.

and additionally, in the case of stereo audio:

- A tone on each track to assure correct phase between tracks.
- Identification on each track as to indicate left or right channels.

  Identification shall be in the form of "blips", as shown in Figure 1. Additionally, identification can be in the form of a voice announcement on each track in the slate section of the leader.

The video track signal format is described in Section 5.2 and Figure 1.

The audio track(s) signal format is described in Section 5.3 and Figure 1.

The leader signals shall be preceeded by 10 seconds (at normal play speeds) of thread-up tape material. The trailer leader signals shall be followed by 5 seconds of video black and audio silence and then 10 seconds of run-out tape material (Refer to Figure 1).

5.2 VIDEO TRACK

The video track leader shall consist of a color bar pattern, as defined by EIA RS-189, recorded with a maximum luminance of 77 IRE units corresponding to 75 percent chroma level, including a 100 IRE unit reference white bar and a 7.5 IRE unit reference black bar.

The position and length of the color bar recording shall be as specified in Figure 1.

5.3 AUDIO TRACKS

The position, content, and length of the audio track recordings shall be as shown in Figure 1.

For mono material, which involves the use of only track 1 for the entire duration of the recorded tape, a 400Hz tone shall be used during the 47 second set-up portion of the leader.

For stereo material, including a tape with both mono and stereo portions, the PREFERRED audio pattern is as shown in Figure 1.

All tones shall be recorded at 0VU reference level (100nWb/m).

The 30-second long 400 Hz tones are used for level setting.

As shown in Figure 1, track 2 contains two "blips", consisting of a silent period into which two 1-second periods of 400Hz tone have been inserted and track 1 contains one 400Hz tone "blip" centered between the "blips" of track 2. These "blips" are used for left/right channel identification. An external mono (1:1) mix of the two tracks produces three "blips".

The phase of the stereo tracks as measured using the 10 kHz leader tones on a reproducer aligned to industry standard azimuth should be within 30 degrees. The leader tones, of course, can certify only the relationship between the final release recorder and NBC's reproducer and do not necessarily represent the phase relationship of the actual recorded material. It is recommended that an oscilloscope stereo phase display be used to monitor every operation in the progress of the sound through multi-track dubbing, possible telecine transfer/ layback, and up to and including the final step to produce the tapes to be delivered to NBC. Such monitoring can guard against phase errors due to azimuth misalignment of any reproducer in this multi-step process.

NBC may return for correction any tape on which the audio phase error appears to be excessive, as seen on the oscilloscope phase display.

5.4 SLATE AND LABELS

Each tape shall be identified with a label on the reel and reel container.

Each tape shall be identified with a slate in the designated portion of the recorded leader.

In the case of material which is recorded in stereo, the label on the reel and reel container, as well as the slate, must be clearly marked:

STEREO AUDIO
TRACK 1 = LEFT
TRACK 2 = RIGHT

This label and slate indication is required to assure that correct material is broadcast and it is in the proper format to be processed appropriately by the Network or NBC's owned stations.

6.0 NBC COMMERCIAL TIMING SPECIFICATIONS

6.1 The picture length of a video tape commercial, inclusive of start of fade-up to end of fade-out, for the normal lengths listed below, shall be :

:10 seconds . . (nominal 300 TV frames)
:15 seconds . . (nominal 450 TV frames)
:20 seconds . . (nominal 600 TV frames)
:30 seconds . . (nominal 900 TV frames)
:45 seconds . . (nominal 1350 TV frames)
:60 seconds . . (nominal 1800 TV frames)

6.2 The audio track length of a video tape commercial must be a minimum of one (1) second less than the picture length listed above, with one-half (1/2) second of silence at head and tail of commercial.

6.3 A one-half (1/2) second video fade-in and fade-out is required at start and end of each video tape commercial, both for aesthetic purposes and to provide separation between commercials running back to back.

7.0 GENERAL SPECIFICATIONS FOR ALL COMMERCIAL BROADCAST MATERIAL

NBC policy is to ensure that all video and audio signals distributed to its affiliated stations and broadcast by owned stations meet the FCC/industry technical specifications and recommendations. It is, therefore, imperative that all material delivered to NBC or its owned stations for broadcast be in accordance with the parameters published in the NBC technical specifications for Video Tape, Film, and Slides.

Special attention should be paid to the width of horizontal and vertical blanking as specified in NBC 03.001. This specification permits some widening of the blanking parameters after final production without exceeding FCC recommendations. (By means of standard processing equipment, blanking intervals can always be widened. If they are too wide initially, they can never be subsequently narrowed.)

Vertical blanking may not exceed 20 lines in either field.

The 1" type C format records the composite video signal on two separate tracks, namely the video track and the sync track. Although it is possible to recover the vertical sync information from the video track, it is highly desirable that all video tapes submitted to NBC in the 1" type C format be complete including the sync track.

NBC will not take responsibility for a fourth audio track which may be recorded within the sync track area, since NBC type C format tape machines are equipped to record and playback only sync from the sync track.

The Federal Communications Commission has repeatedly held that expanded uses of the television signal are within the ultimate control of the broadcast licensee who is responsible for both program content and technical performance. Accordingly, NBC will not consent to the use of the TV signal for encoding commercials which it distributes or broadcasts; and should any commercials be submitted to NBC for broadcast containing such an encoding (whether they use line 20 or 22 of the television signal), they will be either rejected as not being in compliance with NBC standards or edited to delete such encoding.

NBC will accept commercials captioned either on line 21 or in the dual mode (NABTS Teletext). At this time, we broadcast only line 21 captions. However, we do not guarantee or take responsibility for the broadcast thereof.

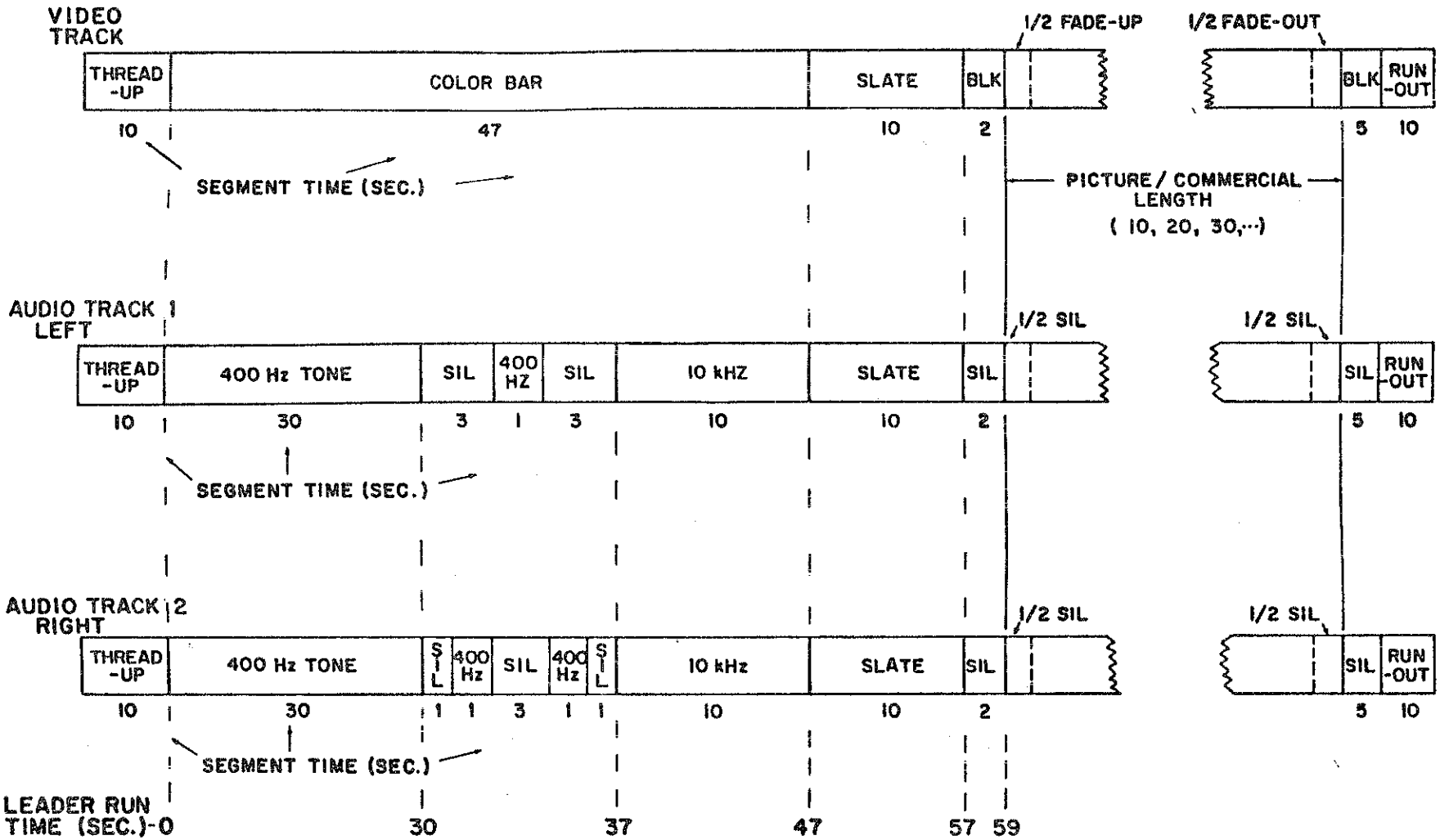

FIGURE 1

NBC SPECIFICATION FOR VIDEOTAPE LEADERS / TRAILERS