SMPTE 17M-1998
Revision of
ANSI/SMPTE 17M-1992

SMPTE STANDARD

for Television Analog Recording — 1-in Type B Helical Scan — Frequency Response and Operating Level

1 Scope

This standard specifies the frequency response and operating level of recorders and reproducers for audio records for 1-in type B helical-scan video tape recording.

2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the edition indicated was 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 standard indicated below.

ANSI/IEEE 152-1992, Audio Program Level Measurement

3 Operating levels

3.1 Recording and reproducing level indicator

The audio recording and reproducing levels of a video tape recorder shall be adjusted with a standard volume indicator, as specified in ANSI/IEEE 152.

3.2 Recorder operating level

When a tape record is recorded from a sinusoidal voltage having a frequency of 1000 Hz such that the rms short circuit tape flux per unit track width on the record is 100 nWb/m ± 3 nWb/m of track width, the recording volume indicator shall be adjusted to deflect to its reference level (0 dB) scale mark.

3.3 Reproducer operating level

When a tape record having an rms short circuit tape flux per unit track width of 100 nWb/m and a frequency of 1000 Hz is reproduced, the reproducing volume indicator shall deflect to its reference level (0 dB) scale mark.

3.4 Time constants

Time constants of 15 μs (t_1) and 3180 μs (t_2) shall be applied.

4 Frequency response

4.1 Recorder flux/frequency response

When a tape record is recorded from a constant voltage level applied to the input terminals of the recording system, the short circuit tape flux level on the record versus frequency, $L_\Phi(f)$, shall be as given by the following equation:

$$L_\Phi(f) = 10 \log_{10} \frac{1 + \left(\frac{F_l}{f}\right)^2}{1 + \left(\frac{f}{F_h}\right)^2} \text{ [dB]}$$

where L_Φ is the relative tape flux level; f is the frequency at which the response is being computed; F_l is the low-frequency transition frequency, 50 Hz; and F_h is the high-frequency transition frequency, 10610 Hz.

4.2 Reproducer flux/frequency response

When a tape record having a short circuit tape flux level versus frequency given in 4.1 is reproduced, the output voltage level of the reproducer versus frequency shall be constant.

Approved
September 1, 1998

5 Track usage

5.1 When a single program record is used, it shall be placed on the audio 1 track.

5.2 When two tracks are used for stereo recording, the left channel shall be recorded on the audio 1 track and the right on audio 2 track.

5.3 A cue signal or time and control code shall be placed on audio 3 track.

6 Program audio head phasing

When the same signal is recorded on two tracks, the tracks shall be so phased that when reproduced with a full-track head, they will be additive.

Annex A (informative)
Bibliography

SMPTE 15M-1998, Television Analog Recording — 1-in Type B Helical Scan — Basic System Parameters