SMPTE 248M-2003
Revision of
ANSI/SMPTE 248M-1993

SMPTE STANDARD

for Television Digital Recording — 19-mm Type D-2 Composite Format — Cue Record and Time and Control Code Record

1 Scope

This standard specifies the content, format, and modulation method of the longitudinal records contained in the cue track and the time-code track in 19-mm type D-2 helical-scan cassette video recorders. Track dimensions and locations are specified in ANSI/SMPTE 245M. The document applies to recorders operating in the 525-line television system with a frame frequency of 29.97 Hz.

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 indicated below.

ANSI/SMPTE 245M-1993, Television Digital Recording — 19-mm Type D-2 Composite Format — Tape Record

SMPTE 12M-1999, Television, Audio and Film — Time and Control

3 General specifications

3.1 Dimensions are in the metric system.

3.2 Tests and measurements made on the tape record to check the requirements of this standard shall be made under the following atmospheric conditions unless otherwise stated:

- Temperature: 20°C ± 1°C
- Relative humidity: (50 ± 2)%
- Barometric pressure: 96 kPa ± 10 kPa
- Tape tension: 0.7 N ± 0.05 N

3.3 Conditioning of the tape stock before recording and testing shall be as follows:

- Storage conditioning: Not less than 24 hours
- Environmental: Stabilized to the conditions specified in 3.2
- Tape tension: Wound on a reel at a tension of 0.6 N to 1.5 N

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3.4 Relative timing

3.4.1 The relationship between the start of address of the time code and the program reference point of a track with an even-field address (count) for the video data is defined by figure 2(b) of ANSI/SMPTE 245M.

The start of address of the time code as recorded on the tape is defined by dimension P2, figure 2(b), of ANSI/SMPTE 245M. This corresponds to the timing of the program reference point for all odd-numbered fields.

3.4.2 The time and control code information shall refer to the video frame during which it is recorded.

3.4.3 Cue information shall be recorded on the tape at a point referenced to the associated video information as defined by dimension P2, figure 2(b), of ANSI/SMPTE 245M (i.e., cue may be up to 90 TV lines early).

3.4.4 Control track servo pulse record timing is described in clause 4.1.5 of SMPTE 247M.

4 Tape speed

The basic value for tape speed is 131.700 mm/s. The tape speed tolerance is ± 0.2%.

5 Cue record

5.1 Method of recording

The signals shall be recorded using the anhysteretic (AC bias) method.

5.2 Flux level

The recorded reference audio level shall correspond to an rms magnetic short circuit flux level of 80 nWb/m ± 5 nWb/m of track width at 1000 Hz.

5.3 Recorded flux characteristics

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

$$L_{\Phi}(f) = 10 \log \left\{ \frac{1}{1 + \left(\frac{f}{fh} \right)^2} \right\} dB$$

where L_{Φ} is the relative flux level; f is the frequency at which the response is calculated; and Fh is the upper transition frequency, 10.8 kHz. (This corresponds to a time constant of 15 microseconds.)

6 Time and control code record

6.1 Method of recording

The signals shall be recorded using the anhysteretic (AC bias) recording method.

6.2 Flux level

The recorded peak-to-peak flux shall correspond to a magnetic short circuit flux level of 250 nWb/m ± 20 nWb/m of track width.

6.3 Recorded flux characteristics

When a tape record is recorded from a constant voltage level applied to the input terminals of the recording system, the short circuit flux level on the record versus frequency shall remain constant.

6.4 Signal

The signal recorded on this track shall be in accordance with SMPTE 12M.

Annex A (informative)
Bibliography

ANSI/SMPTE 226M-1996, Television Digital Recording — 19-mm Tape Cassettes

SMPTE 246M-2003, Television Digital Recording — 19-mm Type D-2 Composite Format — Magnetic Tape

SMPTE 247M-2003, Television Digital Recording — 19-mm Type D-2 Composite Format — Helical Data and Control Records

SMPTE EG 20-1997, Tape Transport Geometry Parameters for 19-mm Type D-2 Composite Format for Television Digital Recording

SMPTE EG 21-1997, Nomenclature for Television Digital Recording of 19-mm Type D-1 Component and Type D-2 Composite Formats

ITU-R BT.470-6 (11/98), Conventional Television Systems