SMPTE 18M-2003
Revision of
ANSI/SMPTE 18M-1996

SMPTE STANDARD

for Television Analog Recording — 1-in Type C — Basic System and Transport Geometry Parameters

1 Scope

This standard specifies the general video record system, video pole tip locations, scanner parameters, scanner-guide locations, tape tension, and test conditions for 1-in type C helical-scan television analog recorders operating on the 525/60 monochrome or NTSC color systems.

2 General specifications

Tests and measurements made on the recorder to check the requirements of this standard shall be made under the following atmospheric conditions:

Temperature for drum diameter:	20°C ± 1°C
Temperature for other tests:	20°C ± 1°C
Relative humidity:	(50 ± 2)%
Barometric pressure:	86 kPa to 106 kPa
Conditioning before testing:	24 h

3 Video and sync record system

3.1 Exactly one field of video shall be recorded during each scanner revolution. The record shall be divided into two parts, video and sync. The user's attention is called to the possibility that compliance with this standard may require use of an invention covered by patent rights.

3.2 The video record shall contain all active picture lines and sufficient vertical sync information for playback synchronization. Information not contained in the video record is defined as the vertical-interval dropout (see SMPTE 19M).

3.3 The sync record shall contain a number of horizontal TV lines during the vertical interval including those of the vertical-interval dropout and sufficient overlap of information for playback switching (see SMPTE 19M).

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3.4 Recording of the sync record shall be optional; however, no other information shall be recorded in the allotted tape area.

4 Scanner pole tips

4.1 There shall be six circumferential pole tip locations as shown in figure 1, top-view. When an operational pole tip is not required, a suitable nonfunctional tip shall be placed in the same location.

4.2 Each tip projection shall be 0.06 mm ± 0.03 mm, measured from the outer surface of the upper drum to the end of the pole tip.

4.3 The axial distance between each video head pole tip and its associated sync head pole tip shall be as shown in figure 1, side view.

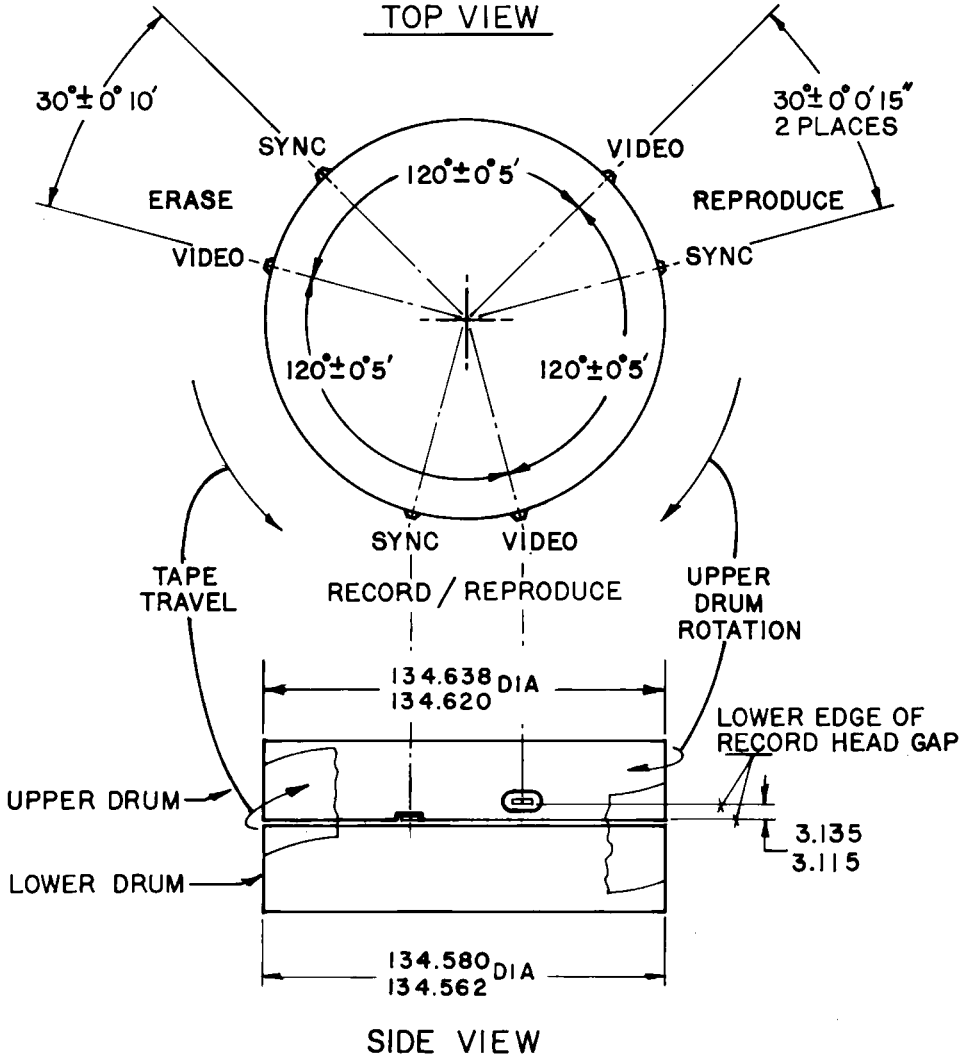

Figure 1 – Pole tip locations and drum dimensions

5 Scanner guides

5.1 Location of the tape entrance and exit guides shall provide a tape wrap angle such that the video record vertical-interval dropout is 10.00 horizontal lines ± 0.25 horizontal lines due to loss of head-to-tape contact, with no electronic switching of the recording signal. Start and end of the vertical-interval dropout shall be measured at the half-amplitude points of the rf envelope.

5.2 The helix angle formed by the scanner and all associated tape guides shall be 2°35'29"± 2".

6 Drum diameter and tape tension

Effective drum diameter, tape tension, helix angle, and tape speed completely determine the video record track angle. Different methods of design and/or minor variations in drum diameter and tape tension will produce equivalent recordings for interchange purposes. Values and operating conditions specified in this standard will produce the reference value of track angle (see SMPTE 19M).

6.1 The actual upper drum diameter shall be 134.620 mm + 0.018 mm – 0.000 mm.

6.2 The actual lower drum diameter shall be 134.580 mm + 0.000 mm – 0.018 mm.

6.3 The upper drum section shall rotate in synchronism with the video tips.

6.4 The center span tape tension shall be 1.7 N ± 0.3 N.

7 Definitions

The following definitions of terms ensure correct understanding of this standard:

7.1 center span tension: A calculated value of tape tension at a point midway between tape entrance and exit guides of the scanner in a video tape recording system.

7.2 drum: A right circular cylinder around which tape is at least partially wrapped in order to form the head-to-tape interface of a video tape recording system.

7.3 effective drum diameter: A value of drum diameter which when used in theoretical calculations will correspond to the actual video record produced in a helical-scan video tape recording system. The effective value is equal to or greater than the actual drum diameter.

7.4 helix angle: The angle formed between the path of the rotating pole tips and the tape reference edge-guiding system on the scanner of a helical-scan video tape recording system.

7.5 lower drum: That part of the drum in a helical-scan video recording system which contacts the reference edge of the tape and usually contains tape-guiding elements (see SMPTE 19M).

7.6 scanner: A mechanical assembly containing a drum, rotating pole tips, and tape-guiding elements used to record and reproduce video tape recordings.

7.7 track angle: The angle of the recorded video track with respect to the reference edge of the tape in a helical-scan video tape recording (see SMPTE 19M).

7.8 upper drum: That part of the drum in a helical-scan video tape recording system which does not contact the reference edge of the tape (see SMPTE 19M).

Annex A (informative)
Bibliography

ANSI/SMPTE 24M-1996, Television Recording — 1-in Reels

ANSI/SMPTE 25M-1995, Video Recording — 1-in Magnetic Recording Tape

SMPTE 19M-2003, Television Analog Recording — 1-in Type C — Records

SMPTE 20M-2003, Television Analog Recording — 1-in Type C Recorders and Reproducers — Longitudinal Audio Characteristics

SMPTE RP 85-1999, Tracking Control Record for 1-in Type C Helical-Scan Television Tape Recording

SMPTE RP 86-1991 (R1995), Video Record Parameters for 1-in Type C Helical-Scan Television Tape Recording