RP 144-1999
Revision of RP 144-1995

SMPTE RECOMMENDED PRACTICE

Basic System and Transport Geometry Parameters for 1/2-in Type L Format

1 Scope

This practice specifies the tape speed, scanner parameters, tape tension, and test conditions for achieving the record dimensions specified in ANSI/SMPTE 229M. The parameters are for reference purposes only and should not be interpreted as the only method available to attain the specifications in ANSI/SMPTE 230M.

2 Definitions

2.1 basic dimension: A fundamental dimension to which no tolerance is applicable.

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

2.3 drum: A cylindrical column around which the tape is at least partially wrapped in order to form the head-to-tape interface of a video tape recording system.

2.4 effective drum diameter: A value of drum diameter which, when used in theoretical calculations, will correspond to the actual video recording produced. The effective value is equal to or greater than the actual drum diameter.

2.5 helix angle: The angle formed between the path of the rotating pole tips and the tape reference edge-guiding system.

2.6 lead signal overlap: That portion of the helical record which is required to provide a duplicate (overlap) recording.

2.7 lower drum: The part of the drum which contacts the reference edge of the tape and provides tape guiding.

2.8 scanner: A mechanical assembly containing a drum, rotating pole tips, and tape-guiding elements used to record and reproduce video tape recordings (see figure 1A).

2.9 track angle: The angle of the video record with respect to the reference edge of the tape.

2.10 upper drum: That part of the drum which does not contact the reference edge of the tape (see figure 1B).

2.11 wrap angle: The angle at the center of the drum rotation subtended by the lines of contact between the drum and the reference edge of the tape.

3 General specifications

3.1 Dimensions in this practice are given in the metric system.

3.2 Tests and measurements conducted on the recorder to measure the parameters specified in this practice should be conducted under the following conditions:

Temperature for drum diameter	20°C ± 0.5°C
Temperature for all other tests	20°C ± 1.0°C
Relative humidity	(50 ± 2)%
Barometric pressure	86 kPa to 106 kPa
Conditioning time before testing	24 hours

4 Tape speed

The tape speed shall be 118.582 mm/s, basic.

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FIGURE 1A
TOP VIEW

FIGURE 1B
DRUM SHOWING
TAPE WRAP

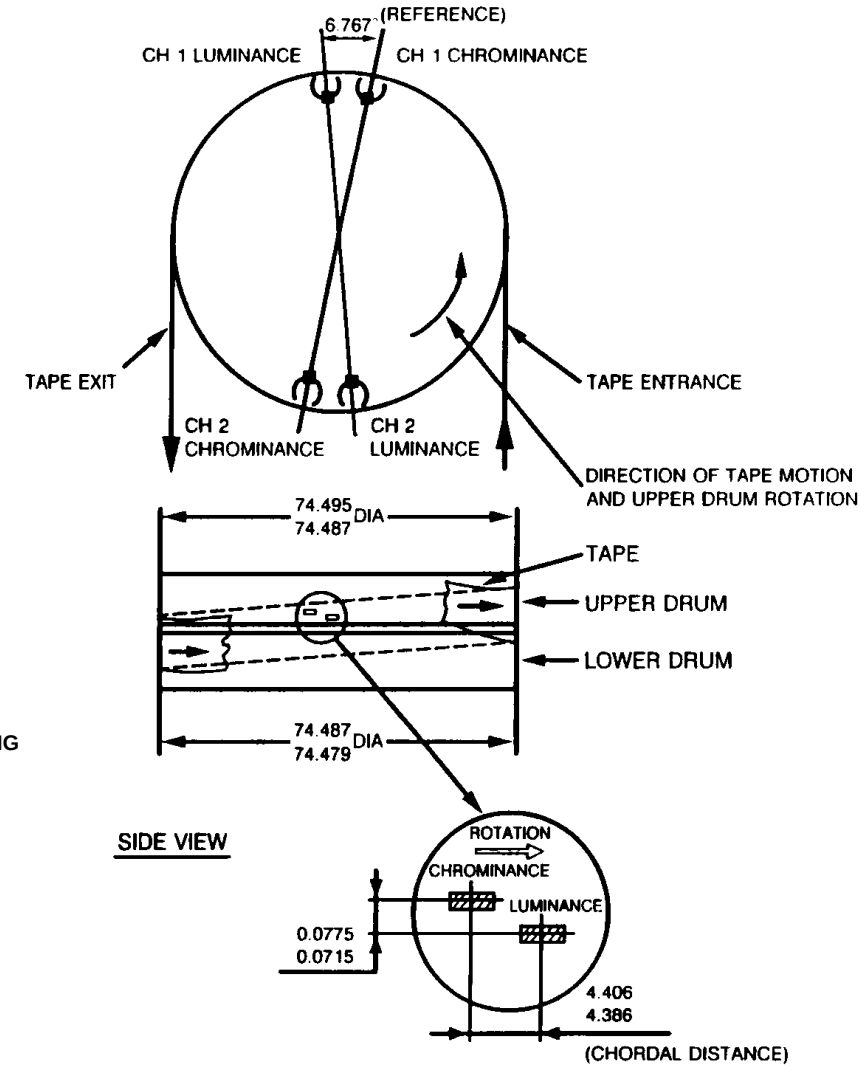

Figure 1 – Chrominance and luminance pole tips

5 Representative scanner parameters

5.1 Drum diameter and structure

The effective drum diameter, tape tension, helix angle, and tape speed taken together completely determine the track angle. Different methods of design and/or minor variations in drum diameter and tape tension will produce equivalent recordings for interchange purposes.

5.1.1 Actual upper drum diameter

The actual upper drum diameter shall be 74.487 mm + 0.008 mm – 0.000 mm.

5.1.2 Actual lower drum diameter

The actual lower drum diameter shall be 74.487 mm + 0.000 mm – 0.008 mm.

5.1.3 Upper drum section

The upper drum section shall rotate together with the video head tips.

5.1.4 Center span tension

The center span tension shall be 0.46 N ± 0.05 N.

5.1.5 Helix angle

The helix angle formed by the scanner and all associated tape guides shall be 4.6° ± 0.003°.

5.2 Scanner pole tips

Four circumferential pole tips shall be located as shown in figure 1.

5.2.1 Pole tip projection

Each pole tip shall project radially 0.040 mm + 0.010 mm – 0.025 mm above the outer surface of the upper drum.

5.2.2 Luminance pole tips

Two pole tips circumferentially spaced at 180° ± 0.003° shall be produced for recording the luminance signal.

5.2.3 Chrominance pole tips

Each luminance pole tip shall have an associated pole tip for recording the time-associated chrominance signal, and when applicable, the AFM audio signals. Chrominance pole tips shall be located at a chordal distance of 4.396 mm ± 0.010 mm in a counter-rotational direction from the associated luminance pole tips, and are axially displaced from the associated luminance pole tips by 0.0745 ± 0.0030 mm in a direction away from the reference edge of the tape. (See figure 1B.)

5.2.4 Channel identification

Suitable means, such as a pulse generator producing one pulse per drum revolution, shall be provided to permit identification of the luminance/chrominance-recording pole-tip pair which records field 1. This pair is identified as channel 1 and the remaining pair as channel 2.

Annex A (informative)
Bibliography

ANSI/SMPTE 229M-1996, Television Analog Recording — 1/2-in Type L — Records

ANSI/SMPTE 230M-1996, Television Analog Recording — 1/2-in Type L — Electrical Parameters, Control Code and Tracking Control

SMPTE 238M-1998, Television Analog Recording — 1/2-in Type L — Tapes and Cassettes