SMPTE RECOMMENDED PRACTICE — RP 137-1986

Data Tracks on Low-Dispersion Magnetic Coatings on 35-mm Motion-Picture Film

1. *Scope*

This practice specifies the position of three data tracks on 35-mm motion-picture film with a low-dispersion-density magnetic surface coated on the nonimage-forming side of the film. Use of one of the data tracks is also specified. The practice applies to all uses of 35-mm motion-picture film, including camera negative, intermediate, and release print films.

2. *Data Tracks*

2.1 The lateral location and width of the data tracks shall be as specified in the figure and table.

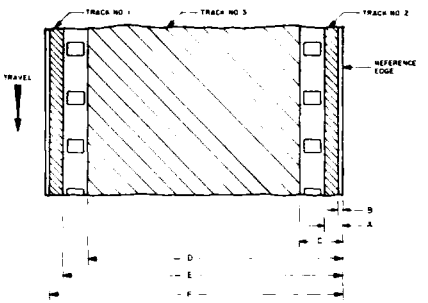
2.1.1 The data tracks shall be referred to by numbers, as shown in the figure, with data track No. 1 farthest from the reference edge. Data track No. 2 shall be the data track nearest the reference edge. Data track No. 3 shall be the data track between the perforations.

2.2 The recording shall be made so that the azimuth of the data track is at an angle of 90° ± 5′ to the reference edge of the film.

2.3 The data tracks shall be recorded in such a manner that they can be reproduced properly by reproducing heads whose gaps are positioned along a common plane and in line.

3. *Track Usage*

3.1 Data track No. 1 shall be designated for the recording of SMPTE time and control code, specified in SMPTE Recommended Practice on Time and Control Codes for 24, 25 or 30 Frame-Per-Second Motion-Picture Systems, RP 136-1986.



As Seen with the Magnetic Surface Toward the Viewer

Dimensions	Inches	Millimeters
A	0.072 ± 0.003	1.83 ± 0.08
B	0.008 max	0.20 max
C	0.179 ± 0.003	4.55 ± 0.08
D	1.207 ± 0.003	30.66 ± 0.08
E	1.306 ± 0.003	33.17 ± 0.08
F	1.369 min	34.77 min

3.2 Data track No. 2 shall be available for the recording of any other data.

3.3 The area designated in the figure as track No. 3 is reserved for noncontact recording and reproduction of a data track or tracks. No format or track location is proposed at this time to encourage development of technology for noncontact recording and reproduction of data tracks.

Approved 23 April 1986

Cinematography — Audio records on 35 mm and 70 mm motion-picture release prints with magnetic stripes — Recorded characteristics

1 Scope and field of application

This International Standard specifies the recorded characteristic of audio records on 35 mm release prints with magnetic striping when reproduced at the nominal speed of 24 frames or 25 frames per second, and on 70 mm motion-picture release prints with magnetic striping when reproduced at the nominal speed of 24 frames per second.

2 Recorded characteristic

With a constant amplitude sine-wave applied to the input of the recording system, the relative characteristic in effective values of the short-circuit magnetic flux versus frequency shall decrease with increasing frequency proportionately to the impedance of a combination of capacitance and resistance having time constants of $\tau = 35$ µs and 3 180 µs (see the note). The characteristic defined above is obtained by the following formula

$$L_\Phi = C_0 - 10 \log_{10} \left[\frac{1 + (2\pi\tau_n)^2 f^2}{1 + 1\,[(2\pi\tau)^2 f^2]} \right]$$

where

L_Φ is the recorded relative magnetic flux level, in decibels;

f is the frequency, in hertz;

τ_1 is the time constant of 3 180 µs;

τ_n is the time constant of 35 µs;

C_0 is a constant calculated to make $L_\Phi = 0$ at the reference frequency of 1 000 Hz.

The approximate numerical values are given in the table, with the values of the recorded magnetic characteristic normalized to 1 000 Hz.

NOTE – A time constant such as that defined by a frequency response curve is a shorthand notation having the shape defined by a time constant of one or more microseconds. This is a convenient way of defining a response curve and is not intended as a recommended electrical circuit.

The corresponding reproducing characteristic is that which gives a flat response when reproducing a sound track recorded with the relative short-circuit flux level defined above.

Table — Frequencies recorded in accordance with clause 2

Frequency Hz	dB	Tolerances +	Tolerances −
40	4,28	2,0	4,0
50	3,20	2,0	4,0
63	2,31	1,5	3,0
80	1,62	1,3	2,0
100	1,16	1,0	1,0
125	0,83	1,0	1,0
160	0,59	1,0	1,0
200	0,45	1,0	1,0
250	0,35	1,0	1,0
315	0,28	1,0	1,0
400	0,22	1,0	1,0
500	0,18	1,0	1,0
630	0,13	1,0	1,0
800	0,07	1,0	1,0
1 000	0,00	1,0	1,0
1 250	− 0,12	1,0	1,0
1 600	− 0,31	1,0	1,0
2 000	− 0,58	1,0	1,0
2 500	− 0,96	1,0	1,0
3 150	− 1,51	1,0	1,0
4 000	− 2,30	1,0	1,0
5 000	− 3,25	1,0	1,0
6 300	− 4,46	1,3	1,0
8 000	− 5,93	1,5	2,0
10 000	7,47	2,0	2,5
12 500	− 9,13	2,0	3,5
16 000	− 11,07	2,0	3,5