Proposed American National Standard

Recorded Characteristic of Magnetic Audio Records on 35-mm Motion-Picture Film

PH22.208M

1. Scope

This standard specifies the recorded characteristic of magnetic audio records on 35-mm motion-picture magnetic film when reproduced at the nominal speed of 24 frames (457 mm or 18 in) per second.

2. Recorded Characteristic

The recorded relative short circuit magnetic flux level versus frequency shall be as given by the following equation:

$$L_\phi = 0.205 - 10 \log_{10} [1 + (2\pi\tau)^2 f^2] \text{ dB}$$

where L_ϕ is the recorded relative short circuit magnetic flux level in decibels, f is the frequency in hertz, τ is a time constant of 35 μs, and 0.205 is a constant calculated to make $L_\phi = 0$ at the reference frequency of 1000 Hz. (See Fig. 1.)

The appropriate numerical values of the recorded relative short circuit magnetic flux level, L_ϕ, for a series of preferred ⅓-octave frequencies in hertz are given in Table 1. The shape of the resulting curve (Fig. 1) is defined by the single time constant indicated. It is only a convenience in defining the desired response curve and is never intended as a recommended electrical circuit.

3. Tolerances

Magnetic audio records on the film shall be recorded to the characteristic specified in Sec. 2.1 within the tolerances given in Fig. 2.

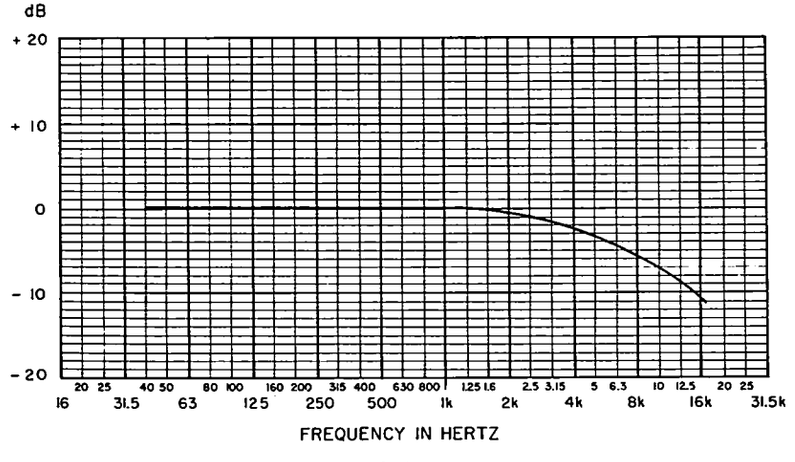

Fig. 1
Recorded Relative Magnetic Flux Level Versus Frequency

Table 1
Relative Flux Level (L_ϕ) Versus Frequency

Hz	dB
40	0.20
50	0.20
63	0.20
80	0.20
100	0.20
125	0.20
160	0.20
200	0.20
250	0.19
315	0.18
400	0.17
500	0.15
630	0.12
800	0.07
1000	0.00
1250	— 0.11
1600	— 0.30
2000	— 0.56
2500	— 0.94
3150	— 1.50
4000	— 2.28
5000	— 3.24
6300	— 4.45
8000	— 5.92
10 000	— 7.46
12 500	— 9.12
16 000	—11.06

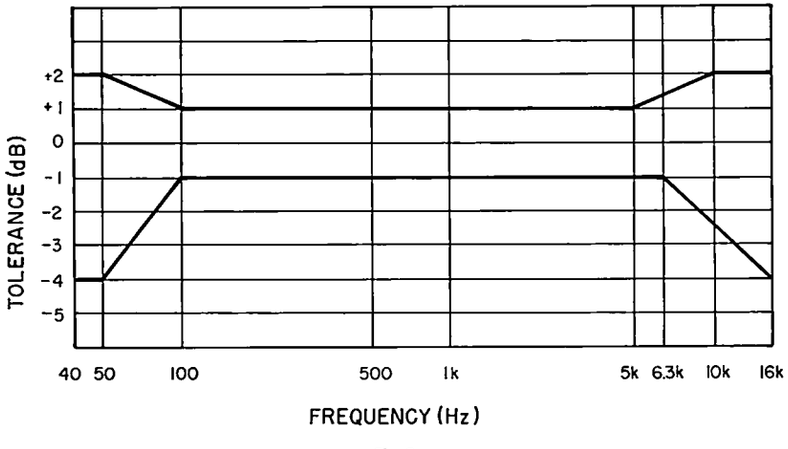

Fig. 2
Tolerances on Recorded Levels

Proposed American National Standard

Recorded Characteristic of Magnetic Audio Records on 8-mm Type S Motion-Picture Prints and Full-Coat Magnetic Film Perforated 8-mm Type S

PH22.209M

1. Scope

This standard specifies the recorded characteristic of magnetic audio records on 8-mm Type S motion-picture prints and on full-coat motion-picture magnetic film conforming to American National Standard Dimensions for 8-mm Motion-Picture Film Perforated 8-mm Type S, 1R, ANSI PH22.149-1981, running at the nominal speed of 24 frames (102 mm [4.0 in]) per second or 25 frames (106 mm [4.2 in]) per second.

2. Recorded Characteristics

The recorded relative short circuit magnetic flux level versus frequency shall be as given by the following equation:

$$L_\phi = 0.03 - 10 \log_{10} \left(\frac{1+(2\pi\tau_h)^2 f^2}{1+1/(2\pi\tau_\ell)^2 f^2} \right) \text{ dB}$$

where L_ϕ is the recorded relative short circuit magnetic flux level in decibels, f is the frequency in hertz, τ_ℓ is the low-frequency time constant of 3180 μs, τ_h is the high-frequency time constant of 90 μs, and 0.03 is a constant calculated to make $L_\phi = 0$ at the reference frequency of 315 Hz. (See Fig. 1.)

The appropriate numerical values of the recorded *relative short circuit magnetic flux levels*, L_ϕ, for a series of preferred ⅓-octave frequencies in hertz are given in Table I. The resulting curve (Fig. 1) is defined by the two time constants indicated. They are only a convenience in defining the desired response curve and are never intended as a recommended electrical circuit.

3. Tolerances

Magnetic audio records on the film shall be recorded to the charactertisic specified in Sec. 2.1 within the tolerances given in Fig. 2.

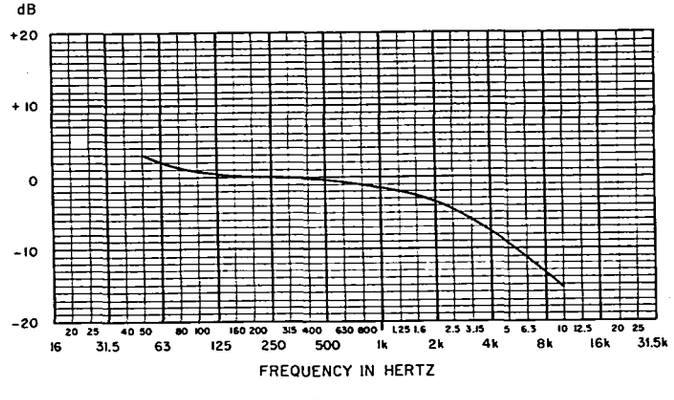

Fig. 1
Recorded Relative Magnetic Flux Level Versus Frequency

Table 1
Relative Flux Level (L_ϕ) Versus Frequency

Hz	dB
50	3.04
63	2.15
80	1.46
100	0.99
125	0.65
160	0.40
200	0.24
250	0.11
315	0.00
400	— 0.12
500	— 0.26
630	— 0.46
800	— 0.76
1000	— 1.16
1250	— 1.72
1600	— 2.56
2000	— 3.54
2500	— 4.74
3150	— 6.17
4000	— 7.83
5000	— 9.51
6300	—11.33
8000	—13.29
10 000	—15.15

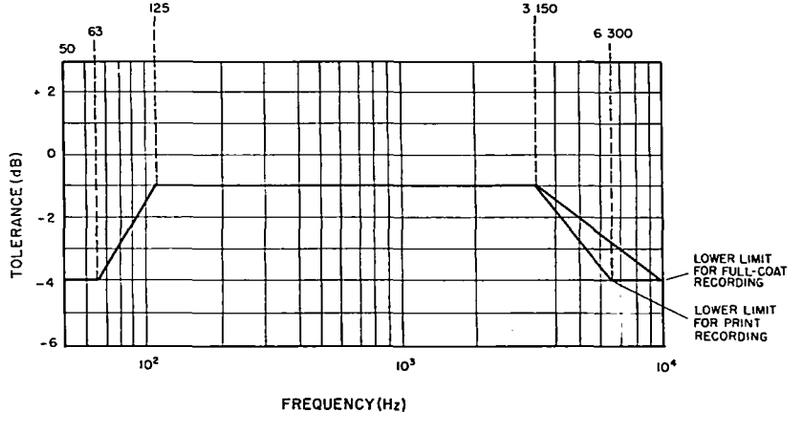

Fig. 2
Tolerances on Recorded Levels