American National Standard

for motion-picture film (35-mm)—recorded characteristic of magnetic audio records—four-track striped release prints

Approved March 8, 1985 Sponsor: Society of Motion Picture and Television Engineers

1. Scope

This standard specifies the recorded characteristic of magnetic audio records on 35-mm four-track striped motion-picture release prints, when reproduced at 24 frames per second or approximately 90 ft (27 m) per minute.

2. Recorded Characteristic

With a constant-amplitude sine-wave signal 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 parallel combination of a capacitance and a resistance having time constants of 35 and 3180 μs. (See Note 1.) The characteristic defined above is obtained by the following equation:

$$L_\phi = C_0 - 10 \log_{10} \left(\frac{1 + (2\pi\tau_h)^2 f^2}{1 + 1/[(2\pi\tau_l)^2 f^2]} \right)$$

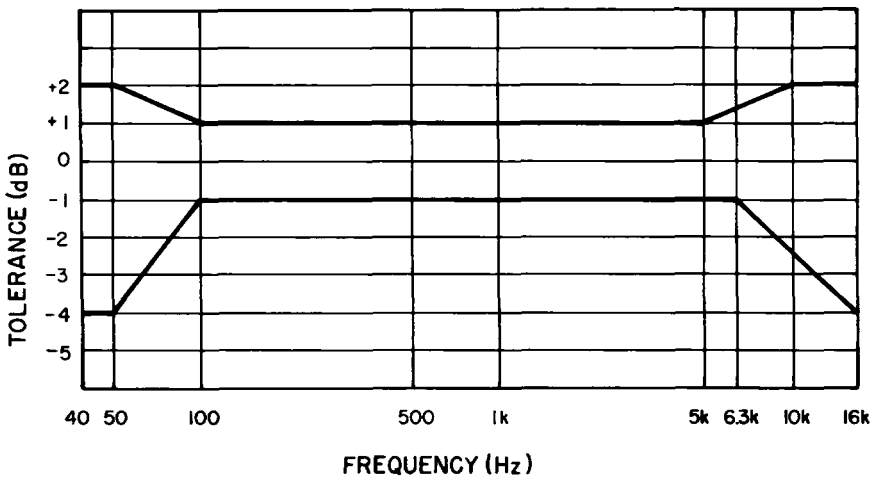
where L_ϕ is the recorded relative short circuit magnetic flux level in decibels, f is the frequency in hertz for which L_ϕ is computed, τ_l is the low-frequency time constant of 3180 μs, τ_h is the high-frequency time constant of 35 μs, and C_0 is a constant with a value of 0.19424 calculated to make $L_\phi = 0$ at the reference frequency of 1000 Hz. The approximate numerical values are given in the table. (See Note 2.)

Frequency, Hz f	Relative Level L_ϕ
31.5	+ 5.66
40	+ 4.29
50	+ 3.21
80	+ 1.63
100	+ 1.16
160	+ 0.59
400	+ 0.23
1000	0.00
2500	— 0.95
4000	— 2.29
6300	— 4.46
8000	— 5.93
10 000	— 7.47
12 500	— 9.13
16 000	— 11.07

3. Tolerances

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

American National Standards Institute, 1430 Broadway, New York, N.Y. 10018



Tolerances on Recorded Levels

Note 1: A time constant is a shorthand notation, such as illustrated by a frequency response curve, having a shape which results from 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.

Note 2: The corresponding reproducing characteristic is that which gives a flat response.

Note 3: It has been shown that a straight 35-μs curve should be used for optimal use of the magnetic medium. It is recognized, however, that it is necessary for the immediate future to continue to add 3180 μs because some theater equipment is unable to compensate for the low end.

American National Standard

for motion-picture film (70-mm)—recorded characteristic of magnetic audio records—striped release prints

Approved March 8, 1985 Sponsor: Society of Motion Picture and Television Engineers

1. Scope

This standard specifies the recorded characteristic of magnetic audio records on 70-mm striped motion-picture release prints, when reproduced at 120 perforations per second (approximately 112 ft ([34 m] per minute or 22.4 in [569 mm] per second) which is 24 frames (5 perforations each) per second.

2. Recorded Characteristic

With a constant-amplitude sine-wave signal 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 parallel combination of a capacitance and a resistance having time constants of 35 and 3180 μs. (See Note 1.) The characteristic defined above is obtained by the following equation:

$$L_\phi = C_0 - 10 \log_{10} \left(\frac{1 + (2\pi\tau_h)^2 f^2}{1 + 1/[(2\pi\tau_\ell)^2 f^2]} \right)$$

where L_ϕ is the recorded relative short circuit magnetic flux level in decibels, f is the frequency in hertz for which L_ϕ is computed, τ_ℓ is the low-frequency time constant of 3180 μs, τ_h is the high-frequency time constant of 35 μs, and C_0 is a constant with a value of 0.19424 calculated to make $L_\phi = 0$ at the reference frequency of 1000 Hz. The approximate numerical values are given in the table. (See Note 2.)

Frequency, Hz f	Relative Level L_ϕ
31.5	+ 5.66
40	+ 4.29
50	+ 3.21
80	+ 1.63
100	+ 1.16
160	+ 0.59
400	+ 0.23
1000	0.00
2500	— 0.95
4000	— 2.29
6300	— 4.46
8000	— 5.93
10 000	— 7.47
12 500	— 9.13
16 000	— 11.07

3. Tolerances

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

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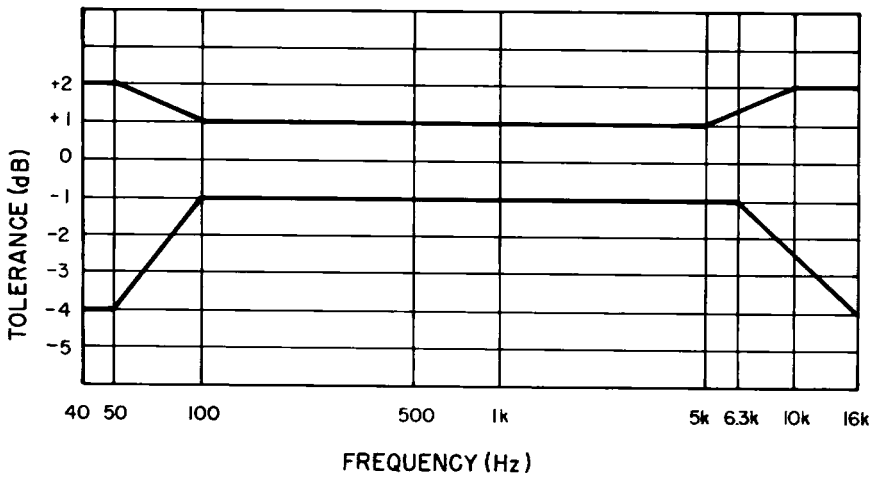

Tolerances on Recorded Levels

Note 1: A time constant is a shorthand notation, such as illustrated by a frequency response curve, having a shape which results from 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.

Note 2: The corresponding reproducing characteristic is that which gives a flat response.

Note 3: It has been shown that a straight 35-μs curve should be used for optimal use of the magnetic medium. It is recognized, however, that it is necessary for the immediate future to continue to add 3180 μs because some theater equipment is unable to compensate for the low end.